

**NAME OF WORK: CONSTRUCTION OF FIRE STATION AT VARIOUS PLACE
IN KHORAJ, SUGHAD AND VAVOL FOR GMC AT GANDHINAGAR.**

Item No: -1

Earthwork in cutting in all sorts of soil and soft murrum including conveying and spreading the stuff, embankment as and where directed within 200meters from the end of the cutting with all required lead and lift.(C) Above 400 Meters upto 500 Meters.

1. Cutting shall be done in proper grade & camber as per measurements given. Care must be taken the tall slopes are evenly and truly dressed. Cutting shall be done to the exact depth required and shall be as per formation level in proper grade and the camber. If extra depth of cutting is done due to negligence of contractor the same shall be refilled with approved quality of materials duly consolidated to the satisfaction of the Engineer-in-charge (without extra cost) Box cutting for soling and metalling in required width the depth shall be done.
2. The stuff received from the cutting shall be utilized for filling cuts and correcting side slopes of bank with all lead and lift directed. Useful Stuff shall be carefully stacked separately as directed,
3. The measurement shall be taken as per cross section measurement of the cutting based on length. breadth, depth measured with tape at every 25 metres interval.
4. **The payment shall be made on Cmt. basis.**

ITEM NO.5 &6:

Providing and laying cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) and curing complete including the cost of form work in foundation and plinth.

1.0. Materials

- 1.1 Water shall conform to M-1. Cement shall conform shall conform to M-3. Sand shall conform to M-6. Stones aggregate 20 mm. nominal size shall conform to M-12.

2.0 Workmanship

2.1 General

- 2.1.1 Before starting concrete the bed of foundation trenches shall be cleared of all loose materials, leveled, watered and rammed as directed.

2.2 Proportion of Mix

- 2.2.1 The proportion of cement, sand and coarse aggregate shall be 1 part of cement, 2 parts of sand and 4 parts of stone aggregate; / 1 part of cement, 3 parts of sand and 6 parts of stone aggregate and shall be measured by volume.

2.3. Mixing

- 2.3.1. The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quantity of work if approved by the Engineer-in-charge. When hand mixing is permitted by the Engineer-in-charge in case of break-down of machineries and in the interest of the work, it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. However in such cases 10% more cement than otherwise required shall have to be used without any extra cost. The mixing in mechanical mixer shall be done for a period 1. 1/2 to 2 minutes. The quantity of water shall be just sufficient to produce a. dense concrete of required workability for the purpose.

2.4 Transporting & placing the concrete.

- 2.4.1 The concrete shall, be handed from the place of mixing to the final position in not more than 15 minute by the method as directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences. .
- 2.4.2 The concrete shall be laid in layers of 15 cms to 20 cms.

2.5. Compacting:

- 2.5.1 The concrete shall be rammed with heavy iron rammers and rapidly to get the required compaction and to allow all the interstices to be filled with mortar.

2.6. Curing

- 2.6.1 After the final set, the concrete shall be kept continuously wet if required by ponding for a period of not less than 7 days from the date of placement. And vertical members with Jute Bags.

2.7. Mode of measurements and payment:

- 2.7.1 The concrete shall be measured for its length, breadth, and depth, limiting dimensions to those specified on plan or as directed.
- 2.7.2 The rate shall be for a unit of one cubic metre

ITEM NO.11:

Providing and laying controlled cement concrete work M200 and curing complete including the cost of form work but excluding reinforcement of reinforced concrete work in : Coping Beam

1.1. The relevant specifications of item No. 5.3.14. Shall be followed for concrete work, except the grade is M200 and length, width and thickness will be as per drawing.

2.0. Mode of measurement & payment

2.1. The relevant specification of item No. 5.3.1. shall be followed except that the item includes the cost form work for exposed concrete work.

2.2. The rate shall be for a unit of one cubic meter.

Item No: -13

Labour charges for giving Trimix treatment to Concrete surface including necessary steel channel formwork and required tools and machinery including preparing joint with concrete cutter machine as required and directed.

1.1. The relevant specifications of Shall be followed for concrete work, except the grade and length, width and thickness will be as per drawing.

2.0. Mode of measurement & payment

2.1. The relevant specification of followed except that the item includes the cost form work for exposed concrete work.

2.2. The rate shall be for a unit of one Square meter.

ITEM NO.15 & 35, 36:

Providing TMT Bar FE 500/500D reinforcement for R.C.C. work including bending, binding and placing in position complete up to floor two level (up to 10 ton)

1.0 MATERIALS:

1.1. High yield Strength Steel Deformed Bars: 1.1.1 High yield strength steel deformed bars are either cold twisted or hot rolled, shall conform to I.S. 1739-1966 and I.S.1139-1966 respectively.

1.2. Mild Steel Binding Wire: 1.2.1 The mild steel wire shall be of 1.63 mm or 1.22 mm. (16 or 18 gauge) diameter and shall conform to I.S. 280-197.

1.2.2 The use of black wire be permitted for binding reinforcement bars. It shall be free from rust, Oil paint, grease, loose mill scale or any other undesirable coating which may prevent adhesion of cement mortar.

2.0. WORKMANSHIP: 2.1. The work shall consist of furnishing and placing reinforcement to the shape and dimensions shows as on the drawings or as directed.

2.2. Steel shall be clean and free from rust and loose mill scale at the time of fixing in position and subsequent concreting.

2.3. Reinforcing steel shall conform accurately to the dimensions given in the bar bending schedules shown on relevant drawings. Bars shall be bent cold to specified shape and dimensions or as directed using a proper bar bender, operated by hand or power to attain proper radius of bends. Bars shall not be bent or straightened in a manner that will injure the material. Bars bent during transport or handling shall

be straightened before being used on the work. They shall not be heated to facilitate bending. Unless otherwise specified, a 'U' type hook at the end of each bar shall invariably be provided to main reinforcement. The radius of the bend shall not be less than twice the diameter of the round bar and the length of straight part of the bar beyond the end of the curve shall be at least four times the diameter of the round bar. In case of bars which are not round and in case of deformed bars, the diameter shall be taken as the diameter of circle having an equivalent effective area. The hooks shall be suitably encased to prevent any splitting of the concrete.

2.4. All the reinforcement bars shall be accurately placed in exact position shown on the drawing and shall be securely held in position during, metal hangers, supporting wires or other approved devices at sufficiently close intervals, Bars shall not be allowed to sag between supports nor displaced during concreting or any other operations of the work. All devices used for positioning shall be of non-corrodible

material. Wooden and metal supports shall not extend to the surface of concrete, except where shown on drawings. Placing of broken stone or brick and wooden blocks shall not be allowed. Pieces of broken stone or brick and wooden blocks shall not be used. Layers of bars shall be separated by spacer bars, precast mortar blocks or other approved devices. reinforcement after being placed in position shall be maintained in a clean condition until completely embedded in concrete. Special care shall be exercised to prevent any displacement of reinforcement in concrete already placed. To prevent reinforcement from corrosion, concrete cover shall be provided as indicated on drawings. All the bars producing from concrete and to which other bars are to be spliced and which are likely to be exposed for a period exceeding 10 days shall be protected by a thick coat of neat cement grout.

2.5. Bars crossing each other where required shall be secured by binding wires (annealed) of size not less than 1 mm in such manner that they do not slip over each other at the time of fixing and concreting.

2.6. As far as possible, bars of full length shall be used. In case this is not possible, overlapping of bars shall be done directed. When practicable, overlapping bars shall not touch each other, but be kept apart by 25 mm or 1.25 times the maximum size of the coarse aggregate whichever is greater by concrete between them. Where not feasible, overlapping bars shall be bound with annealed wires not less than 1 mm thick twisted tight. The overlaps shall be staggered for different bars and located at points along the span where neither shear nor bending movement is maximum.

2.7. Whenever indicated

on the drawings or desired by the Engineer-in-charge, bars shall be joined by couplings which shall have a cross-section sufficient to transmit the full stresses of bars. The ends of the bars that are joined by coupling shall be upset for sufficient length so that the effective cross section at the base of threads is not less than normal cross-section of the bar. Threads shall be standard threads. Steel for coupling shall conform to I.S. 226

2.8. When permitted or specified on the drawings, joints of reinforcement bars shall be butt-welded so as to transmit their full stresses. Welded joints shall preferably be located at points when steel will not be subject to more than 75 percent of the maximum permissible stresses and welds so staggered that at any one section not more than 20 percent of the rods are welded. Only electric arc welding using a process which excludes air from the molten metal and conforms to any or all other special provisions for the work

shall be accepted. Suitable means shall be provided for holding bars securely in position during welding. It shall be ensured that no voids are left in welding and when welding is done in two or three stages, previous surface shall be cleaned properly. Ends of the bars shall be cleaned of all loose scale, rust, grease, paint and other foreign matter before welding. Only competent welders shall be employed on the work. the M.S. electrodes used for welding shall conform to I.S. 814. Welded pieces of reinforcement shall be tested. Specimen shall be taken from the actual site and their number and frequency of test shall be as directed.

2.9. The above specifications shall be followed except that the cold twisted steel bars shall be used with or without hooks and the ends. Deformed bars without hooks shall however comply with however comply with relevant anchorage requirements.

3.0 Mode of measurement and payment: 3.1 For the purpose of calculation consumption, wastage shall both be permitted beyond 5 percent. Excess consumption over 5 % will be charged at penal rate

3.2 Reinforcement shall be measured in length including overlaps, separately for different diameters as actually used in the works. Where welding or coupling is resorted to in place of lap joints such joints shall be measured for a pimento as equivalent length of overlap as per design requirement. From the length so measured, the weight of reinforcement shall be calculated in tones on the same basic of as per M-18 even though steel is supplied to the contractor by the

department on actual weight Length shall include hooks at the ends. Wastage and annealed steel wire for binding shall not be measured and the cost of these items shall be deemed to be included in the rate for reinforcement.

3.3 The rate shall be for a unit of One Kg.

ITEM NO.20:

Carring out plinth treatment to post construction / existing structure by spraying chemical solution for termite control treatment including labour and material consistment with I.S.I specification. Using Chlordene and Chiorpurfiles 20 EC. As Per 6131_paret-II Concentration Weight one percent is recommended i.e one litre 20 EC chemical emulsion with 19 liter give 1 % concentration inclusive of one litre chemical emulsion application at the rate of 5 Litre chemical/ Sqm of surface is recommended as per I.S

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Materials :

The chemicals used for the treatment shall be only one of the following with concentration shown against each in aqueous emulsion

Chemicals Concentration

- 1 Aldrin 0.50%(by weight)
- 2 Heptachlor 0.50%(" ")
- 3 Chordane 1.00%(" ")

2.0 Workmanship :

2.1.The chemical barrier shall be complete and continuous under whole of the structure to be protected.

2.2 The bottom and the sides of foundations up to a highest of 30 cms from the bottom of excavation made form masonry foundation and for basement column pits shall be treated with the chemical emulsion at the rate 5 liter/sq meter of the surface area.

2.3 The chemical treatment shall be carried out when the surface is quite dry chemical treatment shall not be carried out when it is raining or when the soil is wet with rain or sub soil water.

2.4 Once formed treated soil barriers shall be not disturbed if by chance treated soil barrier system.

2.5 The treatment against termite infection shall remain full effective for a period not less than 10 year from date of issue of the final certificate of completion of work.

If at any time during this period any defects in treatment are revealed or any evidence of infection in any part of the building or structure is noticed the contractor shall be rectify the concerned defects within 15 days on receipt of notice from Engineer-in-charge .On contractor 's failure to do so the Engineer-in-charge may get the same rectified through any other agency at contractor's risk and cost, and decision Engineer in charge as to the cost payable by the contractor for the same shall be final and binding to the contractor

2.6 A guarantee bond on appropriately stamped paper shall be given by the contractor to the department in the manner and form prescribed below:

FORM OF GUARANTEE BOND

"I/We.....(Contractor)hereby guarantee that work will remain unaffected and will not be in any way damaged by termite or any other germs of similar type for period of 10 years after completion of the work of anti termite as per the terms and condition of the contract and contractor hereby indemnifies and agrees to save harmless the Government of Gujarat from any loss and or damage that might be caused account of termite and or other similar type of germs and hereby Guarantee to make good any loss or damages suffered by the Government of Gujarat and further guarantee to redo the effective work without claiming any extra cost"

2.7This guarantee shall remain force for the period of 10 year from the completion of the work under the contract and it shall remain binding to the contractor for period of 10years.

2.8 The deposit at the rate of 50% of the cost of this item from the running and final bills shall be recovered and retained for the first one year after the completion of the completion of the guarantee period.

3.0 Mode of Measurement:

3.1 The length and breadth shall be measured correct to cm as per the dimensions of sanctioned plans NO deduction shall be made not extra paid for and opening for pipe etc. up to 0.1 sq mt The rate shall include the cost of all labour materials required for the operation involved for satisfactory completion of this item The said of the trenches 30cms each side and bottom shall be measured under this item.

3.2 The rate shall be for a unit of one sq. meter.

Item No.19

Providing 20 mm thick water proof cement plaster using water proofing powder 1Kg/1bag of cement for all floors on brick / concrete wall work using water proofing materials in C M 1: 4 (1 cement 4 coarse sand) including finishing with a floating coat of neat cement slurry etc complete for all floor. and shall be guaranteed for minimum period of 10 years after handing over the completed building by the main contractor to be finished as directed. Stamp paper guarantee 10 years to be furnished before receiving any payment from the client. The rate shall include for work at all floors and conducting water proof test as directed.

Above item shall be executed as per it no 17.95+17.7 it code 17009+17005 General Technical Specification Booklet &detail item description and shall be as per instruction given by engineer in charge.

The rate shall be for a unit of Sq.mt.

ITEM NO.21:

Constructing Under Ground water tank with Providing and laying controlled cement concrete M250 mix for R.C.C. work including reinforcement, boxing, centering , vibrating, curing and mixed with approved water proofing cement compound or "CEMWET" or "PIDICRETE LW" integral water proofing admixture as water proofing agent to be mixed with 50 kgs. bags shall be as recommended by the manufacture of the water proofing material, concrete work for top, bottom slab & side pardi for underground water tank item incl. Necessary excavation & refilling the available earth, 15 cm thk 1:2:4 for bedding of concrete, 20 mm thk. water proofing cement plaster in C.M. 1:3 with smooth finishing & Glazes tile Dedo, vata, watering etc. Comp. to all face of tank . including locking arrangement outlet, inlet, overflow and washout outlet pipe arrangement as necessary & C.I. Cover 0.60 x 0.45 weight not less than 35 kg with locking arrangement. etc. comp as per structural drawing Including Steel & as directed by Eng-in-charge.

In general the work shall be carried out as per the standard specifications of P.W.D. / C.P.W.D./ GWSSB relevant drawings and as per the instructions of Engineer in Charge. The work shall be carried out as per item description.

List of Indian Standards for Design of GSR / SUMP:-

The structural design of GSR shall be in accordance with provisions relevant I.Ss.

(1) I.S. 3370, Part – 1 to 4, 1965 or latest revised.

(2) I.S. 456 – 2000 or latest revised.

(3) I.S. 1893 – 2000 – 1984 or latest revised.

(4) I.S. 875, Part – 1 to 3, 1987 or latest revised.

General Specification: not specified the suitable water depth / acceptable to field engineer in accordance with

(2) Shape of container (in plan) specified by in data shall be adopted in absence circular shape shall be adopted.

(3) Size shall be fixed as per availability of space (land area) at site / acceptable engineer in charge.

(4) Effect of overlapping of pressure bulbs on soil due near by structure and proposed sump should be considered.

(5) Care shall be taken that no damage should occur to nearby existing structure. Compensation shall be paid for the same by agency.

(6) The minimum concrete grade for RCC shall be M-25.

(7) HYSD Fe 415 / 500 grade reinforcing bars confirming to I.S. 1786 / 1139 shall be considered in design. CRS / TMT bars shall be provided. In saline atmosphere corrosion resistance stainless steel / HCR rebar shall be provided. Any other steel can be used with approval of C.E./ in situation of non availability in market without extra cost.

(8) Minimum size (or thickness) of various components shall be provided as per tender criteria / specifications in absence as per I.S./ Std. practice of G.W.S.S.B. Minimum dimensions specified for various components in tender data / specifications shall be provided without fail.

(9) absence of report it shall be referred from data sheet. If poor soil is found / water table is met with during excavation SBC shall be scientifically ascertained and design shall be revise. No extra shall be paid for increase in quantity.

(10) CI pipes and special shall only be used if type is not specified in tender.

(11) The rate shall include cost of dewatering during excavation making all arrangement when water table meets within depth.

(12) The structure shall be designed properly to resist uplift due to ground water table specified in data or actual ground water table meets with during excavation. No extra shall be paid. If GWT / Uplift is mentioned in tender and during excavation it dose not meet 7.5% rate shall be reduced.

(13) GI pipes railing shall be provided when sump is more than 2 meter above ground level.

(14) Appearance of structure should be aesthetically good looking acceptable to authority

(15) Any charge in size, shape, depth below GL, height above GL, water depth, F.B., size of member etc can be permitted in exceptional case due to site condition or hydraulic design requirement by C.E. No extra shall be paid for change.

(16) Any charge in data, dimensions, shape, water depth, reduction in size if permitted by competent authority and if it reduces quantity then payment shall be reduced prorata.

(17) When capacity of GSR / Sump is > 20 lakh liters two or suitable compartments acceptable to executive engineer shall be designed and provided.

(18) Agency shall engage qualified (at least graduate) consulting engineer for designing the structure and he / she shall visit the site for guidance of work.

(19) 75% part rate shall be payable for concrete, reinforcement and plastering items of container until satisfactory hydraulic testing for water tightness is performed as per tender condition. Till the work shall be treated as incomplete.

Above conditions / general specifications Sr. No. 1 to 19 are part and parcel of tender (contract) and prevail over other provisions in tender.

The safe bearing capacity (SBC) shall be referred from SBC test report. In GI pipes railing shall be provided when sump is more than 2 meter above ground level.

The rate shall be for a unit of one liter.

ITEM NO.37,38,39,40:

Providing and laying block masonry using 230 & 100 mm thick AAC block [autoclaved aerated concrete block] having crushing strength 3-5 N/mm² , using readymade premix tensile adhesive mixture etc complete as directed by Engr Incharge : (At Ground Floor)

18.1.0 MATERIALS

Water shall conform to M-1, Cement shall conform to M-3, AAC BLOCK shall be conform to IS 2185(Part III), Cement Mortar shall conform to M-11 or necessary chemical of approved make and approved by engineer in charge.

18.2.0 WORKMANSHIP (IS 6041:1985)

18.2.1 Wetting of AAC blocks : These blocks need not be wetted before or during the laying in the walls; in case the climatic condition so reqd , the top and sides of the blocks may be slightly moistened so as to prevent absorption of water from the mortar & ensure the development of the required bond with the mortar.

18.2.2 Laying :

Use of mortar in masonry: Mortar shall not be spread so much ahead of the actual laying of the units that it tends to stiffens & lose its plasticity, thereby resulting in poor bonds. For most of the work of the joints, both horizontal & vertical, shall be 10 to 15 mm thick. Except in the case of extruded joint construction, the mortar joint shall be struck off flush with wall surface & when the mortar has started stiffening, it shall be compress with rounded or "U" shaped tool. This compaction is important, since mortar, while hardening, has a tendency to shrink slightly & the thus pull away from the edges of the block. The mortar shall be pressed against the units with a jointing tool after the mortar has stiffened to effect intimate contact between the mortar & the block & obtain a water tight joint.

A layer of mortar shall be spread on full width for suitable length of the lower course. Each block shall first be properly bedded and set home by gently tapping with handle of trowel or wooden mallet. Its inside face shall be flushed with mortar before the next block is laid and pressed against it. On completion of course, the vertical joints shall be fully filled from the top with mortar.

The walls shall be taken up truly in plumb. All courses shall be truly horizontal and all vertical joint shall be truly vertical. Vertical joints in alternate course shall generally be directly one over the other. The thickness of block course shall be kept in uniform.

The block shall be laid with frogs up wards. A set of tools comprising of wooden straight edges, mason's spirit level, square half metre rub, and pins, string and plumb shall be kept on the site of work for frequent checking during the progress of work. Both the faces of walls of thickness greater than 20 cms. shall be kept in proper place. All the connected block work shall be kept not more than one metre over the rest of the work. Where this is not possible, the work shall be raked back according to bond (and not left toothed) at an angle not steeper than 45 degrees. All fixtures, pipes, outlet of water, hold fasts of doors and windows etc. which are required to be built in wall shall be embedded in cement mortar.

18.2.4 Joints : Blocks shall be so laid that all joints are quite flush with mortar. Thickness of joints shall not exposed 10 mm. The face joints shall be raked out as directed by raking tool daily during the progress of work, when the mortar is still green so as to provide key for plaster or pointing to done.

The face of block shall be cleaned the very day on which the block work is laid and all mortar dropping removed.

18.2.5 Curing : Curing is not required for AAC block masonry carried out in readymade premix tensile adhesive mixture

18.2.6 Fixtures - The frames of doors, windows, cup-boards etc. shall be housed into the block work at the correct location and level as directed. The heavy steel doors, window frames etc. Shall be built in with block work, but for

ordinary steel doors and windows required opening for frames, hold-fasts etc. shall be left in the wall and frames embedded later on in order to avoid damage to the frames.

18.2.7 Scaffolding - Necessary scaffolding shall be provided. The supports of the scaffolding shall be sound and strong tied together with horizontal pieces, over which the scaffolding plunks shall be fixed. Simple scaffolding shall be allowed normally. In this case scaffolding hole shall rest in hole header horizontal course only. Minimum number of holes shall be left in block work for supporting horizontal scaffolding poles. The contractor is responsible for providing and maintaining sufficiently strong scaffolding so as to withstand all loads likely to come upon it.

18.2.8 Packing out of Joints - For the face of masonry work, where plastering is to be done, joints shall be raked out to a depth not less than thickness of joints. The face of masonry work shall be cleaned and mortar dropping removed on very same day that masonry work is laid.

18.2.9 Vender list for Aerated Autoclaved Concrete (AAC) Block.
Ecolite, Magicrete, Areocon, Bilttech, Litecon, ultratech-xtralite

18.2.10 If the sample of above brand or Company fails in required testing same will be rejected.

18.3.0 MODE OF MEASUREMENTS & PAYMENT :

18.3.1 The measurements of this item shall be taken for the block masonry fully completed for limiting dimensions not exceeding those shown on the plans or as directed shall be final.

18.3.2 No deductions shall be made from quantity of block work. No extra payment will be made for embedding in masonry holes in respect of the following items ---

- i] Ends of joints, beams, posts, girders, rafters, purlins trusses corbel, steps etc. where cross sectional area does not exceed 500 Sq.Cm.
- ii] Opening not exceeding 1000 Sq.Cm.
- iii] Wall plate and bed plates, bearing of slab, chajjas, and like whose thickness does not exceed 10 Cms. and the bearing does not extend the full thickness of wall.
- iv] Drainage holes and recesses for cement concrete blocks to embed hold fasts for doors, windows etc.
- v] Iron fixtures; pipes upto 300 mm. dia. hold fasts of doors and windows built into masonry and pipes etc. for concealed wiring.
- vi] Forming charges of section not exceeding 350 Sq.Cm. in masonry.
- vii] Apertures for fire places, shall not be deducted nor shall extra labour required to make splaying of jams, throating and making arches over the aperture be paid for separately.

18.3.4 The rate shall be for a unit of one cubic metre.

ITEM NO.46:

Providing throating or plaster drip and moulding to R.C.C. Chajja etc. Comp.

1.0.Materials:

Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6 Cement mortar shall conform to M-11.

2.0.Workmanship

2.1. The work shall be carried out as directed. The proportion of mix for finishing shall be in C.M. 1:2 by volume. Curing shall be done for not less than 7 days. The work shall be carried out in best workman like manner. The throating or plaster drip and moulding shall be one centimeter in thickness.

ITEM NO.47:

Providing and applying 20mm. thick cement plaster patta of c.m. 1:3 (1cement : 3 sand) etc. comp :All Floors

1.0.Materials:

Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6 Cement mortar shall conform to M-11.

2.0.Workmanship

2.1.The work shall be carried out as directed. The proportion of mix for finishing shall be in C.M. 1:2 by volume. Curing shall be done for not less than 7 days. The work shall be carried out in best workman like manner. The thwarting or plaster drip and mounding shall be one centimeter in thickness.

ITEM NO.48:**Prov.20mm deep finished groove etc. comp.**

In general the work shall be carried out as per the standard specifications of P.W.D. / C.P.W.D./ GWSSB relevant drawings and as per the instructions of Engineer in Charge. The work shall be carried out as per item description.

The rate shall be for a unit of one Running Meter.

ITEM NO.50:

Providing & laying "36 x 36" Vitrified 8 mm thick tile flooring over 20 mm (average) base of cement mortar 1:6 (1 cement : 6 coarse sand) or L.M 1:1.5 laid on new surface or fixing on existing flooring by adhesive material including dismantling of existing flooring and jointed with colour cement slurry including finished with flushpointing & cleaning the surface etc. complete for light shade : All floors

11.15.1 VITRIFIED TILE

The tiles shall be of approved make and shall generally conform to IS 15622. They shall be flat, and true to shape and free from blisters crazing, chips, welts, crawling or other imperfections detracting from their appearance. The tiles shall be tested as per IS 13630. Classification and Characteristics of VITRIFIED TILE shall be as per IS 13712.

The tiles shall be square or rectangular of nominal size. Table 1,3,5, and 7 of IS 15622 give the modular preferred sizes and table 2,4,6 and 8 give the most common non modular sizes. Thickness shall be specified by the manufacturer. It includes the profiles on the visible face and on the rear side.

Manufacturer/supplier and party shall choose the work size of tiles in order to allow a nominal joint width upto 2mm for unrectified floor tiles and upto 1mm for rectified floor tiles. The joint in case of spacer lug tile shall be as per spacer. The tiles shall conform to table 10 of IS 15622 with water absorption 3 to 6% (Group BII).

The top surface of the tiles shall be double charged. Glaze shall be either glossy or matt as specified. The underside of the tiles shall not have glaze on more than 5% of the area in order that the tile may adhere properly to the base. The edges of the tiles shall be preferably free from glaze. However, any glaze if unavoidable, shall be permissible on only upto 50 per cent of the surface area of the edges.

11.15.2 Coloured Tiles

Only the glaze shall be coloured as specified. The sizes and specifications shall be the same as for the white glazed tiles.

11.15.3 Decorative Tiles

The type and size of the decorative tiles shall be as follows :

(i) Decorated white back ground tiles

The size of these tiles shall be as per IS 15622.

(ii) Decorated and having coloured back-ground

The sizes of the tiles shall be as per IS 15622.

11.15.4 Preparation of Surface and Laying

11.15.4.1 Base concrete or the RCC slab on which the tiles are to be laid shall be cleaned, wetted and mopped. The bedding for the tile shall be with cement mortar 1:4 (1 cement : 4 coarse sand) or as specified. The average thickness of the bedding shall be 20 mm or as specified while the thickness under any portion of the tiles shall not be less than 10 mm.

11.15.4.2 Mortar shall be spread, tamped and corrected to proper levels and allowed to harden sufficiently to offer a fairly rigid cushion for the tiles to be set and to enable the mason to place wooden plank across and squat on it.

11.15.4.3 Over this mortar bedding neat grey cement slurry of honey like consistency shall be spread at the rate of 3.3 kg of cement per square metre over an area upto one square metre. Tiles shall be soaked in water washed clean

and shall be fixed in this grout one after another, each tile gently being tapped with a wooden mallet till it is properly bedded and in level with the adjoining tiles. The joints shall be kept as thin as possible and in straight lines or to suit the required pattern.

11.15.4.4 The surface of the flooring during laying shall be frequently checked with a straight edge about 2 m long, so as to obtain a true surface with the required slope. In bath, toilet W.C. kitchen and balcony/verandah flooring, suitable tile drop or as shown in drawing will be given in addition to required slope to avoid spread of water. Further tile drop will also be provided near floor trap.

11.15.4.5 Where full size tiles cannot be fixed these shall be cut (sawn) to the required size, and their edge rubbed smooth to ensure straight and true joints. Tiles which are fixed in the floor adjoining the wall shall enter not less than 10 mm under the plaster, skirting or dado.

11.15.4.6 After tiles have been laid surplus cement slurry shall be cleaned off.

11.15.5 Pointing and Finishing

The joints shall be cleaned off the grey cement slurry with wire/coir brush or trowel to a depth of 2 mm to 3 mm and all dust and loose mortar removed. Joints shall then be flush pointed with white cement added with pigment if required to match the colour of tiles. Where spacer lug tiles are provided, the half the depth of joint shall be filled with polysulphide or as specified on top with under filling with cement grout without the lugs remaining exposed. The floor shall then be kept wet for 7 days. After curing, the surface shall be washed and finished clean. The finished floor shall not sound hollow when tapped with a wooden mallet.

11.15.5 Double charge layer

In all double charge tiles the top layer will be coated two times that is top 2 layer of color coated.

11.15.6 Measurements

Length and breadth shall be measured correct to a cm before laying skirting, dado or wall plaster and the area calculated in square metre correct to two places of decimal. Where coves are used at the junctions, the length and breadth shall be measured between the lower edges of the coves. No deduction shall be made nor extra paid for voids not exceeding 0.20 square metre. Deductions for ends of dissimilar materials or other articles embedded shall not be made for areas not exceeding 0.10 square metre. Areas, where glazed tiles or different types of decorative tiles are used will be measured separately.

11.15.7 Rate

The rate for flooring shall include the cost of all materials and labour involved in all the operations described above, For tiles of sizes upto 0.16 sqm. unless otherwise specified in the description of the item. Nothing extra shall be paid for the use of cut (sawn) tiles in the work. Extra over and above the normal rate for white tiles shall be paid where coloured or any other type of decorative tiles have been used.

ITEM NO.51:

Providing and laying light shade vitrified tiles 8 mm to 10 mm thick in skirting , risers of steps and dado on 10 mm thick cement plaster 1:3 (1 Cement : 3 Coarse Sand) & jointed with white cement Slurry.

Item will be executed as per item no 50 specification except that item will be laid in dado and skirting.

ITEM NO. 52:

P & L 24" x 24" vitrified 8 mm thick tile flooring over 20 mm (average) base of cement mortar 1:6 (1 cement: 6 coarse sand) on new surface or fixing on existing flooring by adhesive material including dismantling of existing flooring and jointed with color cement slurry including finished with flush pointing & cleaning the surface etc. complete for antiskit

Item will be executed as per item no 50 specification

ITEM NO. 53:

Providing & Laying 600x600 Matt Vitrified tiles 8 to 10mm thick in flooring over 20 mm (average) base of cement mortar 1:6 (1 cement: 6 coarse sand) on new surface or fixing on existing flooring by adhesive material including dismantling of existing flooring and jointed with color cement slurry including finished with flush pointing & cleaning the surface etc. complete as per approval & selection by architect/engineer in charge.

Item will be executed as per item no 50 specification

ITEM NO.54:

Providing & laying 600mm x 600mm Matt Vitrified tiles of 8 to 10mm thick in skirting, riser of steps & dado laid on bed of 10 mm (Average) base of cement mortar 1:3 (1 Cement : 3 Coarse sand) thick & jointed with white cement slurry etc. complete as per approval & selection by architect/engineer in charge.

Item will be executed as per item no 50 specification except that item will be laid in dado and skirting.

ITEM NO.55:

Providing and laying polished Kota stone slab flooring over 40mm (Average) thick base of cement mortar 1:6 (1-cement : 6-coarse sand) or L.M. 1:1.5 (1-Lime putty :1.5 - coarse sand) laid over and jointed with grey cement slurry mixed with pigment to match the shade of slab including rubbing and polishing etc. complete.(A) 25mm thick.At all Floors

1.0. Materials

1.1. Water shall conform to M-1. Lime mortar shall conform to M-10. Cement mortar shall conform to M-11 Polished kota stone shall conform to M-49,

2.0. Workmanship

2.1. Each slab shall be cut to the required size and shape and fine chisel dressed at all the edges. The sides must be dressed shall have a full contract if a straight edge is laid along. The sides shall be table rubbed with coarse sand before paving. All angles and edges of the slabs shall be true square and free from chippings and giving a plane surface. The thickness shall be 25 mm. (Average) as specified in the item but not less than 20 mm. at any place of the slab.

2.2. Bedding for the Kota stone slabs shall be of cement mortar 1:6 (1 cement : 6 coarse sand) or L.M. 1:1.5 of average thickness 20 mm given in the description of the item. Sub grade shall be cleaned, wetted and mopped Mortar of the specified mix and thickness shall then be spread on an area sufficient to receive one kota stone slab. The slab shall be washed clean before laying. It shall be laid on top, pressed, tapped gently to bring it in level with the other slabs. It shall then be lifted and laid aside. Top surface of the mortar shall then be corrected by adding fresh mortar at hollows or depressions. The mortar shall then be allowed to harden bit. Over this surface, cement slurry of honey-like consistency shall be applied. The slab shall then be gently placed in position and tapped with wooden mallet till it is properly padded in level with and close to the adjoining slab. The joint shall be as fine as possible. The slabs fixed in the floor adjoining, the walls shall enter not less than 10 mm. under the plaster, skirting or dado. The junction between the wall and floor shall be finished neatly. The finished surface shall be true to levels and slopes as directed

2.3. The floor shall be kept wet for a minimum period of 7 days so that bedding and joints set properly

2.4. Polishing shall be normally commenced after 14 days of laying the stone slab. First polishing shall be done with carborundum stones of 120 grade grit fitted in the heavy machine and then second polishing shall be done with carborundum stone of 220 to 350 grade grit fitted in heavy machine. Water shall be properly used during polishing. The stone shall then be washed clean with water When directed by the Engineer-in-charge, wax polish of approved quality shall be applied on the surface with the help of soft cloth over a clean and dry surface. Then the polishing machine fitted with bobs shall be run over it.

2.5. The holes required for Nahni traps, pipes and any other fittings shall be made, without any extra cost.

3.0. Measurement & payment

3.1. The rate shall include the cost of all materials and labour involved in all the operations described above. The kota stone flooring shall be measured in square meters correct to two places decimal, length and breadth shall be measured correct to a centimetre and between the finished face of skirting dado plaster and no deduction shall be made nor extra paid for any opening in floor of areas up to 0.1 sq

3.2. The rate shall be for a unit of one sq. meter

ITEM NO.56:

Providing and laying polished kota stone slab 25mm thick in risers of steps,skirting Dedo and pillars laid on 10mm thick cement mortar 1:3 (1- Cement : 3 coarse sand) and jointed with gray cement slury mixed with pigment to match the shade of slab including rubbing and polishing etc. complete.At all Floors

1.0. Materials

Water shall conform to M-1. Cement mortar shall conform to M-11. Kota stone slab 25 mm thick shall conform to M-49.

2.0. Workmanship

2.1. The relevant specifications of item No. 14.43(A) shall be followed except that the kota stout-fixed for risers of steps, dedo or skirting in C.M. 1:3 and the polishing shall be done manually instead of machine polishing.

3.0. Mode of measurements and payment

3.1. The risers of steps, skirting or dedo shall be measured in sq. meter Length shall be measured along the finished faces of risers, skirting or dedo. Height shall be measured from finished level of treads of floor to top. Lining of pillars shall be measured under this item.

3.2. The rate shall be for a unit of one sq. meter.

ITEM NO. 57:

Providing and laying Granite slab (18 mm thick) one side polished flooring over 40 mm (average) base of cement mortar 1:6 (1 cement : 6 coarse sand) or L.M 1:1.5 laid and jointed with grey cement slurry including rubbing and polishing complete.At all Floors

1.0. Materials

Water shall conform to M-1. Lime mortar shall conform to M-10. Cement mortar shall conform to M-11
Granite river stone shall conform to M-52,

2.0. Workmanship

2.1. Each slab shall be cut to the required size and shape and fine chisel dressed at all the edges. The sides trust dressed shall have a full contract if a straight edge is laid along. The sides shall be table rubbed with coarse sand before paving. All angles and edges of the slabs shall be true square and free from chippings and giving a plane surface. The thickness shall be 25 mm. (Average) as specified in the item but not less than 20 mm. at any place of the slab. **2.2.** Bedding for the Granite stone slabs shall be of cement mortar 1:6 (1 cement : 6 coarse sand) or L.M. 1:1.5 of average thickness 20 mm given in the description of the item. Sub grade shall be cleaned, wetted and mopped Mortar of the specified mix and thickness shall then be spread on an area sufficient to receive one kota stone slab. The slab shall be washed clean before laying. It shall be laid on top, pressed, tapped gently to bring it in level with the other slabs. If shall then be lifted and laid aside. Top surface of the mortar shall then be corrected by adding fresh mortar at hollows or depressions. The mortar shall then be allowed to harden bit. Over this surface, cement slurry of honey-like consistency shall be applied. The slab shall then be gently placed in position and tapped with wooden mallet till it is properly padded in level with and close to the adjoining slab. The joint shall be as fine as possible. The slabs fixed in the floor adjoining, the walls shall enter not less than 10 mm. under the plaster, skirting or dedo. The junction between the wan and floor shall be finished neatly. The finished surface shall be true to levels and slopes as directed.

2.3. The floor shall be kept wet for a minimum period of 7 days so that bedding and joints set properly.

2.4. Polishing shall be normally commenced after 14 days of laying the stone slab. First polishing shah be done with carborundum stones of 120 grade grit fitted in the heavy machine and then second polishing shall be done with carborundum stone of 220 to 350 grade grit fitted in heavy machine. Water shall be properly used during polishing. The stone shall then be washed clean with water when directed by the Engineer-in-charge, wax polish of approved quality shall be applied on the surface with the help of soft cloth over a clean and dry surface. Then the polishing machine fitted with bobs shall be run over it.

2.5. The holes required for Nahni traps, pipes and any other fittings shall be made, without any extra cost.

3.0. Measurement & payment:

3.1. The rate shall include the cost of all materials and labor involved in ail the operations described above.
The Granite stone flooring shall be measured in square meters correct to two places decimal, length and

breadth shall be measured correct to a centimeter and between the finished face of skirting dado plaster and no deduction shall be made nor extra paid for any opening in floor of areas up to 0.1 sq. m.

3.2. The rate shall be for a unit of one sq. meter.

ITEM NO.58:

Providing and laying polished granite stone slab 18 mm thick in risers of steps, dado and pillars laid on 10 mm thick cement mortar 1:3 (1 cement : 3 coarse sand) and jointed with gray cement slurry including rubbing & polishing etc. Complete. At all Floors

1.0. Materials
Water shall conform to M-1. Lime mortar shall conform to M-10. Cement mortar shall conform to M-11
Granite river stone shall conform to M-52.

2.0. Workmanship

2.1. Each slab shall be cut to the required size and shape and fine chisel dressed at all the edges. The sides must be dressed shall have a full contact if a straight edge is laid along. The sides shall be table rubbed with coarse sand before paving. All angles and edges of the slabs shall be true square and free from chippings and giving a plane surface. The thickness shall be 25 mm. (Average) as specified in the item but not less than 20 mm. at any place of the slab. 2.2. Bedding for the Granite stone slabs shall be of cement mortar 1:6 (1 cement : 6 coarse sand) or L.M. 1:1.5 of average thickness 20 mm given in the description of the item. Sub grade shall be cleaned, wetted and mopped Mortar of the specified mix and thickness shall then be spread on an area sufficient to receive one kota stone slab. The slab shall be washed clean before laying. It shall be laid on top, pressed, tapped gently to bring it in level with the other slabs. If shall then be lifted and laid aside. Top surface of the mortar shall then be corrected by adding fresh mortar at hollows or depressions. The mortar shall then be allowed to harden bit. Over this surface, cement slurry of honey-like consistency shall be applied. The slab shall then be gently placed in position and tapped with wooden mallet till it is properly padded in level with and close to the adjoining slab. The joint shall be as fine as possible. The slabs fixed in the floor adjoining, the walls shall enter not less than 10 mm. under the plaster, skirting or dado. The junction between the wall and floor shall be finished neatly. The finished surface shall be true to levels and slopes as directed.

2.3. The floor shall be kept wet for a minimum period of 7 days so that bedding and joints set properly.

2.4. Polishing shall be normally commenced after 14 days of laying the stone slab. First polishing shall be done with carborundum stones of 120 grade grit fitted in the heavy machine and then second polishing shall be done with carborundum stone of 220 to 350 grade grit fitted in heavy machine. Water shall be properly used during polishing. The stone shall then be washed clean with water when directed by the Engineer-in-charge, wax polish of approved quality shall be applied on the surface with the help of soft cloth over a clean and dry surface. Then the polishing machine fitted with bobs shall be run over it.

2.5. The holes required for Nahni traps, pipes and any other fittings shall be made, without any extra cost.

3.0. Measurement & payment:

3.1. The rate shall include the cost of all materials and labor involved in all the operations described above. The Granite stone flooring shall be measured in square meters correct to two places decimal, length and breadth shall be measured correct to a centimetre and between the finished face of skirting dado plaster and no deduction shall be made nor extra paid for any opening in floor of areas up to 0.1 sq. m.

3.2. The rate shall be for a unit of one sq. meter.

ITEM NO.59:

Providing and fixing 35 mm thick solid core flush door shutter of approved make both side lamination using 1mm thick approved laminate sheets with 6mm thick Lipping/border patti around flush shutter including fixing SS hinges, 6 no. - hold fast of size 40 x 6mm flat 300 mm long, wedges, keys, nails, catch screw, lever latches, handle (10 cm), aldop (20 cms), stoppers (20 cms), etc and cutting/ drilling of necessary holes in masonry/ concrete and grouting of holdfasts with (1:2:4) cement concrete all as per drawing, specification and direction of the Engineer, all materials, tools, plant and labour complete c. (All fixtures & fittings shall be stainless steel of approved quality). approved by architect/Engineer Incharge. At all Floors

1.0. Materials

Flush door shall conform to M-30. Plywood shall conform to M-37.

2.0. Workmanship

2.1. The item covers the requirement of preparation of shutters for doors, windows, clerestory windows, their supply and fixing.

2.2. Shutters:

2.2.1. Paneled shutters shall be constructed in the form of timber frame work of styles and rails with panel inserted of type as specified in the detailed drawings. Panel shall be fixed by providing grooves in the style and rails. The styles and rails shall be joined to each other by mortise and tenon joints at right angles.

2.2.2. All members of the shutters shall be straight without any warp or bow and shall have smooth, well planed faces at right angles to each other.

2.2.3. The size of styles and rails shall be as per drawings or as directed. Styles and rails of shutters shall be made of one piece only.

2.2.4 Door shall be finished with 1.0mm laminated sheet of approved brand on both side and with 6mm thk moulding patti around flush shutter.

2.2.5 Including painting with two coats of synthetic enamel paint over one coat of primer and putty to the door frame including fixing SS hinges, 6 no. - hold fast of size 40 x6mm flat 300 mm long, wedges, keys, nails, catch screw, lever latches, handle, aldrops, stoppers, etc and cutting/ drilling of necessary holes in masonry/ concrete and grouting of holdfasts with (1:2:4) cement concrete all as per drawing, specification and direction of the Engineer, all materials, tools, plant and labour complete c. (All fixtures & fittings shall be stainless steel of approved quality). approved by architect/Engineer Incharge.

2.3. Timber paneling:

2.3.1. Thickness of the panel shall be as specified in the item as shown in the drawing or as directed. If the panel is made from more than one piece the pieces shall be finished as shown in the detailed drawings and shall be joined with continuous groove with specified size. The end pieces of the panel and the top and bottom of the panel shall be provided with continuous tongue to frame into groove of the frame shutter. An air space of 1.5 mm. shall be left in the groove of frame of shutter while framing the panels in it.

2.3.2. The faces of the panel as well as various pieces of the panel shall be- closely fitted to the sizes of the grooves.

2.3.3. Finishing of the corners of raised panel edges shall be done as shown in drawings or as directed.

2.3.4. The thickness specified shall be finished thickness and no tolerance will be permitted.

3.0. Mode of measurement & payment

3.1. The rate for shutter includes cost of teak wood frame including painting with two coats of synthetic enamel paint over one coat of primer and putty, All fixtures & fittings shall be stainless steel of approved quality as directed.

3.2. The dimension of the shutter shall be measured clear size of the shutter in close position between the grooves of the frame.

3.3. The rate shall be for a unit of one sq. meter.

ITEM NO.60:

Providing and fixing window having extruded aluminum Colour anodized section frame main outer size 63.50 x 38.10 x 1.95 mm (of Jindal Section no:4605, @ Wt 1.094 Kg / Rmt), horizontal two track member size 61.85 mm x 31.75 mm x 1.20mm (of Jindal Section no: 8687 @ wt.of 0.695 Kg/mt), vertical member of size 61.85 mm x 31.75mm x 1.30 mm (of Jindal Section no:8758 @ wt.of 0.659 Kg/mt) with sliding shutters of horizontal member size 40mm x 18mm x 1.29mm (of Jindal Section no:8949 @ wt.of 0.456Kg/mt), vertical member of size 40mm x 18mm x 1.29mm (of Jindal Section no:8947 @ wt.of 0.456Kg/mt/ Section 8948, @ Wt. 0.457 Kg/mt) with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminum fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc complete for window. At all Floors

General

This work shall consist of furnishing and placing two track aluminum anodized windows of the shape and dimensions shown on the drawings and conforming to these Specifications or as approved by the Engineer in charge.

1.0 MATERIAL

1.1 Window Sliding Shutter frame of aluminum standard section

Frame of shutters shall be of standard anodized Aluminum hollow sections having standard weight per running meter as described in details in item of schedule B

All sections shall be Free from any scratches or holes or any damages on surface. All section shall have finished luster surface on all sides All sections shall be of best quality and free from any defect

1.2 Glazing clits

Glazing clits shall be of standard anodized Aluminum standard sections having standard weight per running meter as described in details in item of schedule B

Glazing clits shall be Free from any scratches or holes or any damages on surface. All section shall have finished luster surface on all sides and shall be of best quality free from any defect

1.3 Rubber Gasket

Rubber gasket shall be of approved brand and make as approved by Engineer in charge and shall be of best quality free from any defect

2.0 Colour tinted glass

Colour tinted float glass shall be of approved colour and quality. The thickness of the glass shall be as prescribed in description of the item The glass shall be of best quality and shall be free from any defect.

3.0. Fixtures

3.2 Anodized Aluminum Handle

Handle of anodized aluminum shall be heavy type handles of approved size and quality of approved make and shall be fixed in position as directed by Engineer in charge It shall be of best quality and free from any defect

2.0 WORKMANSHIP

The window shall be fabricated as shown in detail architectural drawing and as per instruction of engineer in charge, Only approved material shall be used in door colour of anodizing shall be approved colour and shall be anodized up to the satisfaction of engineer in charge. Completed door shall be fixed in position in true line and level and shall be got tested as shown in the drawing as per instruction of engineer in charge.

3.0 Mode of Measurement & Payment:

3.1. The unit rate of aluminum windows shall include the cost of all materials, cost of anodizing, cost of all necessary fixtures and fastenings, glass for sliding shutters and labour charges for fixing frames, shutters and fixing the window in wall at the place shown in drawing and as instructed by Engineer in charge, all tools and plant required for assembling and fixing in position, finishing as per direction of the Engineer-in-charge, and all other incidental expenses for preparing window frame and shutter of specified size to complete the door structure or its components as shown on the drawings and according to these specifications. They shall also include the cost of making, fixing and making walls good by plaster patch colour etc as required

3.2. The aluminum windows shall be measured for its breath and height limiting dimensions to those specified on plan or as directed.

3.3. The payment will be made on square Meter basis of the finished work.

3.4. The rate shall be for a unit of one square meter.

ITEM NO.61:

Providing and fixing window having extruded aluminum Colour anodized section frame main outer size 95mm x 24mm x 1.17mm (of Jindal Section no:2459 @ wt.of 0.738 Kg/mt), horizontal Three track member size 92mm x 31.75mm x 1.30mm (of Jindal Section no:8688,@ Wt.1.07 Kg/mt), vertical member of size 92mm x 31.75mm x 1.50mm (of Jindal Section no:8933,@ Wt. 1.06 Kg/mt) with sliding shutters of horizontal member size 40 mmx18mm x1.29mm (of Jindal Section no:8947@ wt.of 0.456 Kg/mt), vertical member of size 40mm x 18mm x 1.29 mm (of Jindal Section no:8949 @ wt.of 0.456Kg/mt/ with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminum fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc.

General

This work shall consist of furnishing and placing two track aluminum anodized windows of the shape and dimensions shown on the drawings and conforming to these Specifications or as approved by the Engineer in charge.

1.0 MATERIAL

1.1 Window Sliding Shutter frame of aluminum standard section

Frame of shutters shall be of standard anodized Aluminum hollow sections having standard weight per running meter as described in details in item of schedule B

All sections shall be Free from any scratches or holes or any damages on surface. All section shall have finished luster surface on all sides All sections shall be of best quality and free from any defect

1.2 Glazing clits

Glazing clits shall be of standard anodized Aluminum standard sections having standard weight per running meter as described in details in item of schedule B

Glazing clits shall be Free from any scratches or holes or any damages on surface. All section shall have finished luster surface on all sides and shall be of best quality free from any defect

1.3 Rubber Gasket

Rubber gasket shall be of approved brand and make as approved by Engineer in charge and shall be of best quality free from any defect

2.0 Colour tinted glass

Colour tinted float glass shall be of approved colour and quality. The thickness of the glass shall be as prescribed in description of the item The glass shall be of best quality and shall be free from any defect.

3.0. Fixtures

3.2 Anodized Aluminum Handle

Handle of anodized aluminum shall be heavy type handles of approved size and quality of approved make and shall be fixed in position as directed by Engineer in charge It shall be of best quality and free from any defect

2.0 WORKMANSHIP

The window shall be fabricated as shown in detail architectural drawing and as per instruction of engineer in charge, Only approved material shall be used in door colour of anodizing shall be approved colour and shall be anodized up to the satisfaction of engineer in charge. Completed door shall be fixed in position in true line and level and shall be got tested as shown in the drawing as per instruction of engineer in charge.

3.0 Mode of Measurement & Payment:

3.1. The unit rate of aluminum windows shall include the cost of all materials, cost of anodizing, cost of all necessary fixtures and fastenings, glass for sliding shutters and labour charges for fixing frames, shutters and fixing the window in wall at the place shown in drawing and as instructed by Engineer in charge, all tools and plant required for assembling and fixing in position, finishing as per direction of the Engineer-in-charge, and all other incidental expenses for preparing window frame and shutter of specified size to complete the door structure or its components as shown on the drawings and according to these specifications. They shall also include the cost of making, fixing and making walls good by plaster patch colour etc as required

3.2. The aluminum windows shall be measured for its breath and height limiting dimensions to those specified on plan or as directed.

3.3. The payment will be made on square Meter basis of the finished work.

3.4. The rate shall be for a unit of one square meter.

ITEM NO. 62:

Providing and fixing standared extruded of alluminium section of size 63mm x 38.10mm x 1.2mm (Jindal Section :2434, @ Wt. 0.643 Kg/mt) with colour anodized alluminium frame for ventilation with 5 mm thick frosted glass as details etc complete for Ventilation.

General

The item shall consist of preparing and fixing of aluminum ventilators using square aluminum tubes of specified size having 5 mm thick frosted glass louvers as specified and fixing the same in structure at required places in accordance with the details shown on the drawings or as approved by the engineer in charge.

1.0 MATERIAL

1.1 Main outer frame of rectangular tube

Main frame shall be of standard coloured anodized Aluminum hollow sections as described in details in item of schedule B

Aluminum alloy used in the manufacture of extruded Window section shall confirm to I S designation HEA-WP of I S 733-1975 and also Designation WVG –WP of I S 1285-1975 section shall be as specified in the drawing and design

All sections shall be Free from any scratches or holes or any damages on surface. All section shall have finished luster surface on all sides

1.2 5mm thick frosted glass :- The **5mm. thick frosted glass** shall be of approved colour and quality The thickness of glass shall be as per item description The Glass shall conform to M-38.2 Page No. 18 of General technical specification book for building works

1.3. Rubber Gasket

Rubber gasket shall be of approved make and shall be free from any scratches or holes or any damages on surface. and shall have finished luster surface on all sides

2.0 WORKMANSHIP

The Ventilators shall be fabricated as shown in detail architectural drawing and as per instruction of engineer in charge, Only approved material shall be used in Ventilators colour of anodizing shall be approved and shall be anodized up to the satisfaction of engineer in charge. Completed Ventilators shall be fixed in position in true line and level.

3.0 Mode of Measurement & Payment :

4.1. The unit rate of aluminum Ventilator shall include the cost of all materials, cost of anodizing, cost of all necessary fixtures and fastenings, Glass sheet for louvers labour charges for fixing frames and ventilator and fixing the same in wall at the place shown in drawing and as instructed by Engineer in charge.

4.2. The Ventilator shall be measured in square meter

4.3. The rate shall be for a unit of one square meter.

Item No :-63

Providing and fixing fully fixed stainless grill using 50mm x 8mm (SS 304) stainless steel flats vertical 50mm X 8 mm stainless steel lats horizontal, 16 mm diameter round stainless steel bar at 100 mm center to center fixed to S.S. flats necessary S.S screws and other S.S fittings etc. complete.

1.0. Materials

The Stainless steel shall conform to ASIS SS 304 Grade.

2.0. Workmanship

2.1. The S.S. Grill shall be prepared as per the drawing or as directed for fixing to wooden frames of windows etc.

2.2. The grill shall be fabricated to the designs and patterns shown in the drawings and the weight shall be as directed, and the joints shall be reverted or welded as shown in the plan or as directed. The grill so formed shall be fixed into the frames of the windows etc. before they are erected in position. The outside strip frame of the grill shall be housed to its full thickness into the recess cut into the frame of the windows etc. The grill shall be fixed to the frame with number of bolts and nuts or screws viz. bolt nut/screw per 30 cm. of the length of outer strip subject to minimum of 2 Nos. on each side of the frame or as indicated in the drawing or as directed.

2.3. The bolts and nuts or screws shall be counter sunk and shall be fixed with the top of their heads flush with the face of the frame strips.

3.0. Mode of measurements & payment

3.1. Item includes necessary fixtures and fittings like screw etc.

3.2. The rate shall be for a unit of one square meter.

Item No :-64

Providing and fixing M.S. grills of required pattern to marble/granite frames of window etc. with M.s. flats at required spacing and frames around, square or round bars fixed with round headed bolts and nuts or by screws, including oil painting with one coat of primer of approved quality and brand & two coats of synthetic enamel oil paint etc. complete as per detail drawing and as directed by Engineer in charge.

1.0. Materials

The structural steel shall conform to M-22

2.0. Workmanship

2.1. The M.S. Grill shall be prepared as per the drawing or as directed for fixing to wooden frames of windows etc.

2.2. The grill shall be fabricated to the designs and patterns shown in the drawings and the weight shall be as directed, and the joints shall be reverted or welded as shown in the plan or as directed. The grill so formed shall be fixed into the frames of the windows etc. before they are erected in position. The outside strip frame of the grill shall be housed to its full thickness into the recess cut into the frame of the windows etc. The grill shall be fixed to the frame with number of bolts and nuts or screws viz. bolt nut/screw per 30 cm. of the length of outer strip subject to minimum of 2 Nos. on each side of the frame or as indicated in the drawing or as directed.

2.3. The bolts and nuts or screws shall be counter sunk and shall be fixed with the top of their heads flush with the face of the frame strips.

3.0. Mode of measurements & payment

3.1. No payment shall be made for weight of screws, bolts nuts etc. only weight of grill shall be paid.

3.2. The rate shall be for a unit of one kg.

ITEM NO.65:

Applying two coats of Birla or Asian acrylic lapy (putty) & two coats of primer of approved brand and manufacture on new wall surface to give an even shade including thoroughly brushing the surface free from mortar dropping and other foreign matter and sand papered smooth.

General :

Scope of work includes cleaning off the entire surface , remove all loose particles, dust, scale, smoke, grease from the surface, sand the surface with Emery paper 180 and wipe clean, applying 2 coats of white birla putty.

Material:

manufacturer's standard guide line Putty Make.

Workmanship:

The Putty shall be of approved brand. Plaster filler to be used for filling up uneven surfaces , small cracks and holes etc and it should be done as per the manufacturer's standard guide line. The whole process of paint required 2 times sand with 180 emery paper wipe off and 1 time sand with 320 emery paper wipe off.

Mode of measurement:

All the measurement shall be taken on net surface area actually painted, deduction will be made from the area for fixtures, grills, ventilation, elect boxes and such obstructions not painted , if they are individually more than 0.05 sq.m.

Rate :

Rate is to include for All materials of puttys, sand paper, etc with labour required for scaffolding, cleaning off the surfaces, cleaning the site after completion of job, etc as directed by engineer in charge. Rate is for the net surface area of Painted surfaces in Square metre.

ITEM NO.66:

Wall painting (two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surface to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth. .(A) for wall and similar surfaces.ALL FLOORS

1.0. Materials

Water shall be conform M-1. The plastic emulsion shall conform to I.S.: 5411-1969 (part-1).

2.0. Workmanship

2.1. Scaffolding : The relevant specifications of item-No. 18.11 Para 2.1 shall be followed.

2.2. Preparation of surface : The relevant specification of item No. 18.44 Para 2.2 shall be followed.

2.3. Preparation of Mix :

This shall be done as per manufacturer's instructions. The thinning of emulsion is to be done with water and not with turpentine. The quantity of thinner to be added shall be as per manufacturer instructions.

2.4. Application :

2.4.1. Before pouring into small containers for use, the paint shall be stirred thoroughly in item container. When applying also, the paint shall be continuously stirred in the smaller container, so that its consistency is kept uniform.

2.4.2. The paint shall be laid on evenly and smoothly by means of crossing and laying off the crossing and consist of covering the area over with paint, brushing the surface hard for the first time over and then, brushing alternately

in opposite direction two or three times and then finally brushing lightly in direction at right angles to the same. In this process, no brush Marks shall be left after the laying off is finished. No hair marks from the brush or clogging of paint puddles in the corners of panels, angles of mouldings, etc. shall be left on the work. The full process of crossing and laying off will constitute one coat.

2.4.3. The paint shall be applied with brush or rollers. For undecorated surfaces, the surface shall be treated with minimum two coats of cement water proofing paint. The second or subsequent coat shall not be started until the proceeding coat as become sufficiently hard to resist marking by brushing being used.

2.4.4. The surface on finishing shall present a flat velvety smooth finish. It shall be even and uniform in shade without patches, brush marks, paint drops etc.

2.5. Precautions :

(a) Old brushes if they are to be used with emulsion paints, shall be completely dried of turpentine or oil paint by washing in warm soap water. Brushes shall be quickly washed in water immediately after use and kept immersed in water fusing break periods to prevent the paint from hardening on the brush.

(b) In the preparation of wall for plastic emulsion painting, no oil base petals shall be sued in filling cracks, holes etc.

(c) Splashes on floors etc. shall be cleaned out without delay as they will be difficult to remove after hardening.

(d) Washing or surfaces treated with emulsion paint shall not be done within 3 to 4 weeks of application

2.6. Protective payment : The relevant specifications of item No. 18.11 shall be followed.

3.0. Mode of measurements and payment

3.1. The relevant specifications of item No. 18.11 shall be followed.

3.2. The rate shall be for a unit of One sq. meter.

ITEM NO. 67:

Wall painting (two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surface to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth. (B) for ceilings and soffits .ALL FLOORS.

The Item shall be executed as per the specifications of It. No. 66.

ITEM NO. 68:

Finishing wall with weather proof exterior emulsion paint like Asian apex ultima ,ICI weather shield , Neroleck , or equivalent on wall surface (two coats) to give an required shape even shade after thoroughly brushing the surface to remove all dirt, and remains of loose powdered materials etc. complete.

In general the work shall be carried out as per the standard specifications of P.W.D. / C.P.W.D./GWSSB relevant drawings and as per the instructions of Engineer in Charge. The work shall be carriedout as per item description

Material :

The paint shall be (Textured exterior paint/Acrylic smooth exterior paint/ premium acrylic smooth exterior paint) of approved brand and manufacture. This paint shall be brought to the site of work by the contractor in its original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnight's work. The materials shall be kept in the joint custody of the contractor and the Engineer-in-Charge. The empty containers shall not be removed from the site of work till the relevant item of work has been completed and permission obtained from the Engineer-in-Charge.

Preparation of Surface :

For new work, the surface shall be thoroughly cleaned off all mortar dropping, dirt dust, algae, fungus or moth, grease and other foreign matter of brushing and washing, pitting in plaster shall make good, surface imperfections such as cracks, holes etc., should be repaired using white cement. The prepared surface shall have received the approval of the Engineer-in-Charge after inspection before painting is commenced.

Application :

Base coat of water proofing cement paint.

The solution shall be applied on the clean and wetted surface with brushes or spraying machine. The solution shall be kept well stirred during the period of application. It shall be applied on the surface which is on the shady side of the building so that the direct heat of the sun on the surface is avoided. The method of application of cement paint shall be as per manufacturer's specification. The completed surface shall be watered after the day's work.

The second coat shall be applied after the first coat has been set for at least 24 hours. Before application of the second or subsequent coats, the surface of the previous coat shall not be wetted.

For new work, the surface shall be treated with three or more coats of water proof cement paint as found necessary to get a uniform shade.

For old work, the treatment shall be with one or more coats as found necessary to get a uniform shade.

Before pouring into smaller containers for use, the paint shall be stirred thoroughly in its containers, when applying also the paint shall be continuously stirred in the smaller containers so that its consistency is kept uniform. Dilution ration of paint with potable water can be altered taking into consideration the nature of surface climate and as per recommended dilution given by manufacturer. In all cases, the manufacturer's instructions and directions of the Engineer-in-Charge shall be followed meticulously.

The lids of paint drums shall be kept tightly closed when not in use as by exposure to atmosphere the paint may thicken and also be kept safe from dust.

Paint shall be applied with a brush on the cleaned and smooth surface. Horizontal strokes shall be given, First and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks.

The specifications in respect of scaffolding, protective measures, measurements and rate shall include all material and labour involved in all the operations described above.

The rate shall be for a unit of one sq. meter

Item No :-69

Providing & applying single coat of textured at external surface at all floor levels with three coats of weather proof cement exterior paint of approved standard brands make (Asian/Dulux/Narolac) at outer side of the building on RCC or Masonary walls. Rate to include for all labour, materials, staging, scaffolding, cleaing, curing etc. application of texture after thoroughly brushing th`e surface to give an even shade free from mortar dropping/other foreign matter etc. complete. application of textures & paints must be as per company's standard instructions. Texture and colour selection as per approved by engineer in charge.(It is recommended to use low voc paints rated by IGBC)

1.0. Materials

Approved quality **textured finish**

2.0 WORKMANSHIP

2.1. SCAFFOLDING

Wherever scaffolding is necessary it shall be erected in such a way that as far as possible on part of scaffolding shall rest against the surface to be white or colour washed. A properly secured strong and well tied suspended platform (Zoola) may be used for white washing. Where ladders are used, pieces of old gunny bags shall be tied at

top and bottom to prevent scratches to the floors and walls. For white washing of ceilings proper stage scaffolding shall be erected where necessary.

2.2. PREPARATION OF SURFACE

2.2.1 The surface shall be thoroughly cleaned of all dust, dirt, mortar cropping and other foreign matter before white wash is to be applied.

2.2.2 The surface spoiled by smoke soot shall be scraped with steel wire brushes or steel scrapers or shall be rubbed with over-burnt surkhi or brick bats. The surface shall be then broomed to remove all dust, dirt and shall be washed with clean water.

2.2.3 Oil or grease spots shall be removed by suitable chemical and smooth surface shall be rubbed with wire brushes.

2.2.4 All unsound portion of the surface plaster shall be removed to full depth of plaster rectangular patches and plastered again after raking the masonry joints properly. Such portion shall be wetted and allowed to dry. They shall then be given one coat of white wash.

2.2.5 All unnecessary nails shall be removed; the holes cracks patches etc. shall be made good with materials similar in composition to the surface to be prepared. The surface shall be thoroughly wetted with clean water before textured finish is applied.

3.0. Mode of measurements & payment

3.1. The chicken wire mesh shall be measured in Square meter.

3.2. The rate shall be for a unit of one Square meter.

Details specification same as per Item description and as instruction by Engineer-in-charge.

The rate shall be for a unit of one **Square metre**.

Item No :-71

Steel work, welded in built up sections framed work including cutting, hoisting, fixing in position and applying a priming coat of red lead paint. (A) In beams and joists, channels angles Tees, flats, with connecting plates or angle cleats as in main and cross beams. Hip and jack rafters, purlins conneted to common rafters and the like.including applying a priming coat of red lead paint and two coats of oil painting etc complete.

LAYING OUT : The steel structures, as shown in the drawings or as per directions of the Engineer-in-charge, shall be laid out on a level platform to full scale and to full size in parts. A steel type shall be used for measurements to ensure maximum accuracy.

Wooden templates 12 mm to 19 mm thick or steel templates shall be made to correspond to each connecting gusset plate and rivet holes shall be accurately marked on them and drilled. The templates shall be laid on the steel members and holes for revetting and bolting marked on them. The ends of the steel members shall also be marked for cutting. The base of steel columns and the position of anchor bolts shall be carefully set out.

FABRICATION :

The steel sections as specified shall be straightened and cut square and accurately to correct lengths. The cut ends exposed to view shall be finished smooth. No. two pieces shall be welded or otherwise jointed to make up required length of a member except as indicated in the drawing or otherwise specifically permitted by the Engineer - in - charge. All straightening and shping to form shall be done by application of pressure and not by manning. Any bending or cutting shall be carried out in cold condition (unless otherwise directed) in such a manner as not to impair the strength of the metal.

All stiffeners shall be formed by pressure, and where practicable, the metal shall not be cut and welded in making these. In major works or where so specified, shop drawings giving complete details and information for the fabrication of the component parts of the structure, including the locating, type, size, length and details of rivets, bolts or welds shall be prepared in advanced of the actual fabrication and approved by the Engineer-in-charge. The drawing shall indicate the shop and filed rivets, bolts and welds. The steel members shall be distinctly marked or stencilled with paint with the identifca- tion marks as given in the shop drawings.

The bars shall be thickned at the ends so as to provide for screwed threads and gradually tapered off to meet their normal section.

Great accuracy shall be observed in the fabrication of various members. Do that these can be assembled without being unduly packed strained or forced into position and when built-up shall be true and free from twists, bricks buckles or open joints.

Before making holes in individual mambers, for fabrication the steel work intended to be rivetes or bolted to gather shall be assembled or clamped properly and tightly so as to ensure chose abutting or lapping of the surface of the

different members. All stiffeners shall be tightly both at top and bottom without being drawn or caulked. The abutting joints shall be cut or dressed true and straight and fitted close together,

We splice plates and fillers under stiffeners shall be cut to fit within 3 mm of flange angles. We plated or girders which have no cover plates shall have their ends flush with the top of angles forming the flanges unless otherwise required. The we plates, when spliced shall have clearance of not more than 6 mm.

The erection clearance for cleated ends of members connecting steel to steel preferably be not greater than 1.5 mm.

The erection clearance at the ends of beams without web cleats shall not be more than 3 mm. at each end but where for practical reasons, greater clearance is necessary, suitably designed seating shall be provided.

Pins and rollers shall be accurately turned to gauge. These shall be straight and smooth and free from flaws. The roller bearing shall be provided with adequate arrangement for holding the girders or truss resting on it, from lateral displacement.

Expansion bed plates shall be planed true and smooth. The planning of bed plates shall be done in the direction of the movement of the girder or truss resting on it.

Column splices and butt joints of struts and impression members depending on contract for stress transmission shall be accurately machined and closebutted over the whole section. In column caps and bases, the ends of shafts together with the attached gussets, angles, channels etc. after riveting together shall be accurately machined so that the parts connected butt against each other over the entire surface of contact. Connecting angles or channels shall be fabricated and placed in position with great accuracy so that they are not unduly reduced in thickness by machining.

The ends of all bearing stiffeners shall be machined or ground to fit tightly both at the top and bottom.

All holes shall generally be drilled to the required size and at the required position. Sub-punching shall be permitted, provided it is done 3 mm. less in diameter and reamed thereafter to the required size.

Holes for rivets and black bolts shall be large by 0.4 to 6 mm. as shown in appendix-I under column "Coarse" than the nominal diameter of the rivets or black bolts depending upon the dia of rivets. Holes for turned and fitted bolts shall be drilled or reamed large by 0.2 to 3 mm. depending upon the dia of bolts as shown in Appendix under column "Medium".

When the number of plates or sections to be riveted together exceeds three or when their total thickness is 90 mm or more, holes shall be drilled or reamed in position, after the members are assembled and the parts firmly hold together by clamps. Before riveting or bolting up or welding finally. The members shall be taken part and all burns removed.

Holes shall have their axis perpendicular to the surface bore through. The drilling or reaming shall be free from burrs and the holes shall be clean and accurate.

The work or fabrication shall be completed in the work shop as far as it is practicable to do so. Site jointing shall be done with rivets or turned and fitted bolts, or black bolts or welding as shown in drawings or as directed by the Engineer-in-charge. Generally, the following principles shall govern the use of rivets, turned and fitted bolts and black bolts :-

[i] Rivets or turned and fitted bolts shall be used where the connection is such that slip under load has or be avoided.

[ii] Black bolts may be used very sparingly where a force is carried through a connecting without impact, vibration or reversal of stresses (unless such reversal is due to wind forces.)

In the case of welding, holes shall only be made for the bolts used for temporary fastening as shown in drawings.

WELDING :

Welding shall be generally be done by electric process. The electric arc method being economical, is usually adopted. Where public electricity is not available, a suitable generator shall be arranged. Gas welding shall be resorted to using oxyacetylene flame with specific period approval of the Engineer-in-charge.

Gas welding shall not be permitted for structural steel work. Gas welding requires heating of the members to be welded along with the welding rod and is likely to create temperature stresses in the welded members. Precautions shall therefore be taken to avoid distortion of the members due to these temperature stresses.

The work shall be done as shown in the shop drawings which should clearly indicate various details of the joints to be welded, type of welds, shop and site welds, as well as the types of electrodes to be used. Symbol for welding on plans and shop drawings shall be according to IS : 813-1061. As far as possible, every effort shall be made to limit the welding that must be done after the structure is erected so as to avoid the improper welding that is likely to be done due to heights and difficult positions of scaffolding etc. apart from the aspect of economy.

PREPARATION OF SURFACE :

Surfaces which are to be welded together, shall be free from loose mild-scale, rust, paint, grease or other foreign matter. A coating of boiled linseed oil shall be permitted.

PRECAUTIONS :

All operations connected with welding and cutting equipment shall conform to the safety requirement given in IS : 818-1968 for "Safety and Health requirements in Electric and Gas welding and Cutting Operations".

The following points shall be borne in mind during the process of welding :-

[a] Welds shall be made in the flat position. Wherever practicable.

[b] Arc length, voltage and amperage shall be suited to the thickness of materials, type of groove and other circumstance of the work.

[c] The sequence of welding shall be such that where possible, the members which offer the greatest resistance to compression are welded first.

All defective welds which shall be considered, harmful to the structural strength shall be cut out and rewelded.

Finished welds and adjacent parts shall be protected with clean boiled linseed oil and after all slag has been removed. Welds and adjacent parts shall be painted after the same are approved by the Engineer-in-charge. All the members shall be thoroughly cleaned of rust, scales dust etc. and given a priming coat of lead painting before fixing then in position.

RATE :

The rate shall be for a unit of one Kg.

ITEM NO.72

Providing and laying and fixing 50mm/25mm thick expansion joint by hydro cell semi rigid UV resistance with high performance laminated closed cell polythene foam joint filler in sheet foam as directed, etc. complete.

1.0 Material

The material must be Hydrocell is a semi-rigid, UV resistant, cross-linked, non-absorbent, closed-cell polyethylene sheet material used to support joint sealants in expansion joints.

2.0 Workmanship

For pavements having thickness more than 50 MM. cut SIL FLEX of required size & provide markings for Dowel Bars & fix it in position by hammering the SIL FLEX gently through the Dowel Bars. For pavements having thickness up to 50 MM, fix SIL FLEX in position to already casted slab by nailing 50 MM long Mild Steels nails on top of casted. Concrete at suitable intervals & at minimum 50MM from edge & bent forward to hold the SIL FLEX. Remove the nails after 24 hours of casting the next panel.

3.0 Mode of measurements & payments:

The rate shall be for a unit of one sq. meter.

ITEM NO.74:

Providing cinder filling in sunken floors including watering, consolidating, ramming complete.

In general the work shall be carried out as per the standard specifications of P.W.D. / C.P.W.D./ GWSSB relevant drawings and as per the instructions of Engineer in Charge. The work shall be carried out as per item description

Material :

Cinder shall conform to M-9 on page-11. The relevant specification shall be followed as per General Technical specification for Building work booklet It.No.4.0.0.5/ P.No.36 except that item is for cinder in sunks instead of filling brick bat charra in foundation.

Mode of Measurement and payment :

The rates includes all materials, labour, tools and plants in satisfactory completion of work as specified above.

The rates shall be for unit of one Cum for actual work done.

ITEM NO.75:

Providing and fixing 150 mm wide, approved quality chicken wire mesh at junction of brick work and RCC work or two dissimilar surfaces, at all heights fixed by nails, rowal plugs or tag by cement mortar 1:3 before applying the plaster, including curing, scaffolding all complete as directed.

Material, Workmanship and Fixtures & Fastening etc. :

The chicken wire mesh shall be provided to prevent cracks appearing between junctions of column /beams and walls, 150 mm wide chicken wire mesh fixed with U nails, 150 mm centre to centre before plastering the junction. The plastering of walls and beam/column in one vertical plane should be carried out in one go.

Mode of measurement & payment :

The rates includes all materials, labor, tools and plants in satisfactory completion of work as specified above. The rates shall be for unit of one Sq.mt. for actual work done.

Item No :-76

Providing and fixing Stainless Steel railing having 50 mm x16G ASIS 304 Grade dia hollow stainless steel pipe as hand rail and 32x32 mmx16G ASIS 304 Grade sq. hollow stainless steel pipe with combination of 10 cm long 16 mmx16G ASIS 304 Grade dia pipe as vertical supports 16 mm x16G ASIS 304 Grade dia hollow stainless steel pipes as intermediate members running through stainless steel 30 mm dia solid runners having threaded screw to fix the runner with vertical support including cutting bending welding & fabrication the structure as per drawing including finishing etc complete

1.0 Materials

1.1 Material shall be best approved quality obtaining and they shall comply with the respective ASTM specification.

1.2 If necessary samples of all material shall be accompanied by the manufacturer's test certificate or by a recognized test laboratory by vendor's own cost.

1.3 The vendor shall submit samples of material before supply for our verification from the original raw materials.

1.4 Stainless steel shall be austenitic chromium nickel steel, possessing rust, acid and heat resistant properties confirming to IS : 6603 and IS : 6911. Mechanical properties / grade for such stainless steel shall be as specified by the accepting authority, but in grades. AISI 304 which is equivalent to grade 04Cr18Ni10 of IS : 6911 satisfies the requirements of mechanical properties of structural steel. Other grades of stainless steel for specific requirements. For application in adverse / corrosive environment, stainless steel shall conform to AISI 316L or 02G17 Ni Mo2 of IS : 6911.

2.0 Workmanship

2.1 There shall be one vertical per step fixed along the edge of the stair.

2.2 The excess welding shall be properly smoothed and burrs removed. The whole railing shall be finished and fixed in true line and level.

2.3 All the railing should be highly polished after grinding.

2.4 After the final finish the railing should be properly wrapped by thin polythene.

2.5 The nature of railing should be straight or curved as per requirement.

2.6 Fixing on the ground should be with SS CSK screw, if necessary anchor fishnet may be used as per requirement.

3.0 TECHNICAL SPECIFICATIONS

3.1 Type : SS 304 grade

3.2 Size of pipes, 38 mm dia. 25 mm dia (14 gauge) – matt polish

SS Hand rail – 50mm dia. Mid rail- 12mm dia Balustrade – 75mm

3.3 Nature of railing : the railing may be straight or curved as per requirement.

3.4 Manufactured conditions should be as follows :

A – Annealed

H – Hardened and tempered at a relative low temperature.

T - Hardened and tempered at a relatively high temperature.

S – Strain hardened relatively high cold work.

B – Relatively severe cold work.

3.5 The specification covers stainless and heat resisting steel pipes, rods and sheets.

Chemical compositions of stainless steel: Alloy	C	Mn	P	S	Si	Cr	Ni
304	0.08	2.00	0.045	0.030	0.75-1.00	18.00 – 20.00	8.002 –

3.6 Mechanical properties of stainless steel pipes :

a. Type – 304 f. Elongation % in 50 MM - 40

b. UNS Designation – S 30400 g. Hardness Brinell – 150,

c. Condition – Annealed h. ASTM Specification – A240

d. Tensile strength Mpa. – Annealed i. Rust Proof and Non Magnetic.

e. % Proof strength Mpa. – 205 j. Polished outside.

ITEM NO.78

Aluminium Composite panelling to drop-fin and front column, etc: Supply & fixing of Aluminium Composite Panel (ACP), 3 mm thick in required colours for interiors/exterior consisting of two layers of aluminium skins of 0.25 mm thick sandwiching a thermo plastic core in continuous lamination process with PVDF coating for interior/exterior grades ensuring long colour and no fungal attacks. Base frame work with aluminium sections of 65mm X 25mm shall be fixed over the brick work and the above aluminium panels shall be fixed to the frame work as cladding with material:- silicone dowcorring 789weather silicone in 995 dow corring.It includes cost of labour, materials, accessories, adhesives, scaffolding, wastages, transport, taxes, fixing into a neat finish in aesthetic point of view, without any undulations in facias all complete as per drawing and Instruction of engineer in-charge.

1.0 Material:

Use all the material Required for Aluminium Composite Panelling / Cladding (4 mm thick) (exterior grade and as per Item Description.

2.0 Workmanship:

As per Item Description and specific method of work should be submitted.

3.0 Mode of measurement:

The work shall be measured in Sq.mt as directed. ,

The rate shall be for a unit of one Sq.mt

ITEM NO.79

Providing & Fixing Cubicle System of MODLE TYPE - TITAN SS SERIES of Cubicle size 1000mm (W) X 1550mm (D) X 1980mm (H) having 12 mm thick Compact Laminate HPL Boards of Single Color with Door Size : 1750mm (H) X 610mm (W) & Overall Height Of Cubicle 1980mm (Including bottom Gap of 150mm) including Accessories of Standard – Merino Make Stainless Steel - 304 Grade)- SS “U” Channel, SS “F” channel, SS Top Rail, SS Coat Hook , SS Privacy Thumb turn c/w Occupancy Indicator, SS Door Knob, SS Hinges with Cover, SS Adjustable Foot - 316 Grade, Rubber Lining for Groove, S.S.Screws 304 G & P.V.C Wall Plugs etc. complete approved by architect/Engineer Incharge.

1.0 Material:

CUBOID -MAXToilet cubicle (of following standard dimension which includes 600mm door size width)made of heat, bacteria, water, chemical, scratch, impact and anti bacterial resistan 12mm thick solid compact laminate panels.

2.0 Workmanship:

As per Item Description and specific method of work should be submitted.

3.0 Mode of measurement:

The work shall be measured in Sq.mt as directed. ,

The rate shall be for a unit of one Number.

Item No.:80

Providing and laying broken chine mosaic flooring for terrace using 12 mm to 20 mm broken pieces of glazed tiles to be laid over cement mortar 1:3 to plain or slope and to be tempered to bring mortar creme out upto surface using white cement including rounding off junctions and extending them upto 15 cm along the wall,clearing with water and oxalic acid etc. as directed.

In general the work shall be carried out as per the standard specification of P.W.D., C.P.W.D. relevant drawing and as per the instruction of Engineer in charge.

1.0 Material:

The cement shall confirm to M-3 (3.1 / P.9 / V.1), water shall confirm to M-1 (1.1 to 1.5 / P.9 / V.1), sand shall confirm to m-6 (6.1 to 6.3 / P.9, 10 / V.1), water proofing compound shall confirm to manufacturer's specification, brick bats shall confirm to M-14 (14.1 to 14.2 / P.12 / V.1) and cement mortar shall confirm to M-11 (11.1 to 11.3.2 / P.11 / V.1). White glazed tiles used for items shall be broken to proper size and shape. Material shall be got approved by Engineer in charge.

2.0 Workmanship:

Immediately on applying the cement slurry over the surface of the brick bat coba and when the slurry applied is still green, Provide in position 6 mm. thick broken glazed tiles in size 12 mm to 20 mm, of odd sizes and shapes laid in approved crazy pattern (with one or more color in pattern, as directed) for floor/ dado having plain or curved surfaces, in cement mortar 1:2 proportion with cement, floating, joints finished with white or

approved color cement including tamping, watering, curing, cleaning with oxalic acid, etc. complete as per the Engineer's instructions.

For Concrete bedding as per General Specification Booklet Item No:5.4.1

3.0 Curing and Testing the Treatment

The entire surface thus treated shall be flooded with water by making ponding arrangement with weak cement mortar, for a minimum period of two weeks.

4.0 Measurement & payment:

- The measurement shall be taken along the finished surface of treatment including the rounded and tapered portion at junction of parapet wall. Length and breadth shall be measured correct to a cm and area shall be worked out to nearest 0.01 sqm. No deduction in measurement shall be made for openings or recesses or chimney stacks, roof lights or khurras of area upto 0.40 sqm., nor anything extra shall be paid for making such openings, recesses etc. For areas exceeding 0.40 sqm., deduction will be made in the measurements for the full openings and nothing extra shall be paid for making such openings.
- The rate shall include the cost of all labour and materials involved in all the operations described above.
- The rate shall be for a unit of one sq. meter.

ITEM NO. 81:

(A) Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc. consisting of following operations.(a) Applying and grouting a slurry coat of neat cement using 2.75 kg/ sqm of cement admixed with proprietary water proofing compound conforming to IS : 2645 over the R.C.C. slab including cleaning the surface before treatment.(b) Laying cement concrete using broken bricks/brick bats 25 mm to 100 mm size with 50 % of cement mortar 1:5 (1 Cement : 5 Coarse sand) admixed with proper water proofing compound confirming to IS : 2645 over 20 mm thick layer of cement mortar of mix 1: 5 (1 cement : 5 Coarse sand) admixed with proprietary water proofing compound confirming to IS : 2645 to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of junction of walls and slabs. (C) after two days of proper curing applying a second coat of cement slurry admixed with proprietary water proofing compound conforming to IS:2645(d) finishing the surface with 20 mm thick jointless cement mortar of mix 1:4 (1 cement : 4 coarse sand) admixed with proprietary water proofing compound conforming to IS: 2645 and finally finishing the surface with neat cement slurry and making of 300 x 300mm square.(e) the whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Eng-in-charge.

Providing and laying water proofing treatment to vertical and horizontal surface of depressed portion of W.C. kitchen and like consisting of (a) I Course of applying cement slurry @ 4.4 Kg./Sq.m. mixed with water proofing compound like S.B.R., (Styrene Butadiene Rubber) like conforming to IS:2645 in recommended proportions. (b) II Course of 20 mm cement plaster 1:3 mixed with water proofing compound in recommended proportion.

Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces, horizontal and vertical surface of depressed portion of W.C., bath etc. consisting of following operations. (a) applying and grouting a slurry coat of neat cement using 2.75 kg/sq.mt. of cement admixed with proportionate water proofing compound conforming to IS:2645 over the R. C.C. slab including cleaning the surface before treatment . (b) Laying cement concrete using broken bricks/brick bats 25 mm to 100mm size with 50% of cement mortar 1:5(1 Cement :5 Coarse sand) admixed with proportionate water cement mortar of mix 1:5 (1 Cement :5 Coarse sand) admixed with proportionate water proofing compound conforming to IS: 2645 to required slope and treating similarly the adjoining walls upto 300mm height including of junctions of walls and slabs. (c) After two days of proper curing, applying a second coat of cement slurry admixed with proportionate water proofing compound conforming to IS: 2645 and finally finishing the surface with trowel with neat cement slurry and making of (300x300) mm square. (e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and

as directed and specified by the engineer –in-charge. With average thickness of 120 mm and minimum thickness at khurra as 65mm.

(1) The whole work is to be executed through specialized agency with a gurantee of 10 years given no a prescribed proforma duly stamped.

(2) The rate shall include for work at all floors and conducting water proof test as directed.

MODE OF MEASUREMENT AND PAYMENT :

Rate including cost of all materials labours, tools, plants etc.required to complete the item.

Horizontal plan area of horizontal surfaces with side adjoining walls upto 300 mm height including of junctions of walls and slabs Verticle surface area shall be actual work carried out at site.

The rate shall be for a unit of one sq. mt.

ITEM NO.83:

Providing and fixing washbasin with single hole for pillar trap at all floor level with C.I. or M.S. Brackets painted white including cutting holes and making good the same including (A) Vitreous china flat back wash basin 550mm x 400mm size in white colour (a) providing and fixing C.P. brass waste for wash basin or sink(A) 32mm (b) providing and fixing M.I.fisher union for wash basin or sink(A) 32mm (c) piller tap, capstan head, screw down high pressure with screw shanks and back nuts for 15mm dia. for all floor (d)brass screw down stop tap (e)Rubber plug for sink or washbasin (f) chromium plated bottle trap with necessary coupling of approved quality for wash basin.

1.0. Materials

1.1. The white glazed earthenware wash basin shall be 550 mm. x 400mm. of 1st quality and make as approved by the Engineer-in-charge. The wash basin shall-conform to M-59.

2.0. Workmanship

2.1. The washbasin shall be fixed on the wall as and where directed. The wash basin shall be supported on a pair of M.S. or C.I. brackets fixed in C.M. 1:3 (1 cement : 3 sand). The bracket shall conform to I.S. : 775-1962. The wall plaster on the rear shall be cut to rest the top edge of the washbasin. After fixing the basing, plaster shall be made good and surface finished to match the existing one.

2.2. The brackets shall be painted white with ready-mixed paint.

2.3. The C.I. brass trap and union shall be connected to 32 mm. dia. waste pipe which shall be suitably bent towards the wall and which shall discharge into an open drain leading to a gully trap or direct in to gully-trap on the ground floor and shall be connected to a waste pipe through a floor trap on the upper floors. C.P. brass trap and union may not be provided where the surface drain or a floor trap is placed directly under the basin and the waste is discharged in to vertically.

2.4. The height of the front edge to the wash basin from the floor level shall be 80 cms.

2.5. The necessary inlet, outlet connections and fittings such as pillar cocks, CP dress waste trap waste pipe, stop cock, chain wish rubber plug etc. shall be fixed.

2.6. The payment of fittings shall be made separately under separate items.

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(a) Providing and fixing 32 mm, dia. C.P. brass waste for wash basin or sink.

1.0. Materials

1.1. The C.P. brass trap and unions shall be of 32 mm. dia. and of best quality and make as approved by the Engineer-in-charge

2.0. Workmanship

2.1. C.P. brass waste trap and union shall be connected to 32 mm dia waste pipe which shall be suitably bent towards the wail which shall discharge into drain through a floor trap The C.P brass waste trap shall be provided for wash basin or sink as the case may be.

(b) providing and fixing M.I.fisher union for wash basin or sink(A) 32mm

1.1. The relevant specifications of item No. 23, 136 (A) shall be followed except that the diameter of M I fisher union shall be 32 mm. dia.

(c) pillar tap,capstan head, screw down high pressure with screw shanks and back nuts for 15mm dia. for all floor

1.0. Materials : The capstan head pillar tap of specified dia. of C.R over brass shall be best quality and shall conform to I.S. : 1975 - 1961. The pillar taps shall be tested quality.

2.0. Workmanship

2.1. The capstan head pillar tap of specified dia. shall be fixed as directed with required washers of selected leather or rubber asbestos composition or of plastic as directed. The cock shall fixed with pipe line white Zink end spun yarn, to make joint water tight. The work shall be carried out in best workman like manner.

(d)brass screw down stop tap:

1.0. Materials : The brass screw down stop cock of specified dia shall conform to IS. : 781 -1977 The stop cock shall be of tested quality.

2.0 Workmanship

The stop cock shall be fixed in position by means of Jam nut and socket. The stop cock shall be fixed near the inlet of the water meter or as directed. The joints shall be done with white zinc and spun yarn. The joint shall be tested for leak proofing.

(e)Rubber plug for sink or washbasin:

1.0. Material: The rubber plug for sink or wash hand, basin shall be best quality and make as approved by the Engineer-in-charge.

2.0. Workmanship :

2.1. The rubber plug with plain shall be fixed in wash basin or sink as directed.

(f) chromium plated bottle trap with necessary coupling of approved quality for wash basin.

1.0. Materials : The chromium plated bottle trap shall be approved make and of best quality. The bottle trap shall be provided with coupling.

2.0. Workmanship

The bottle trap shall be fixed on wash hand basin with wooden gullies and screws as directed. The work shall be carried out in best workman like manner.

3.0. Mode of measurements and payment

3.1. The rate includes cost of all materials and labour involved for satisfactory completion of this item.

3.2. The rate shall be for a unit of One number.

ITEM NO.84:

Providing & fixing 600 mm. x 450 mm. mirror of superior glass at all floor levels, mounted on 6 mm. th. A.C. sheet or plywood sheet & fixed to wooden plugs with C.P. brass screws and washers etc. for all floor.

1.0. Materials

1.1. The 600 mm. x 450 mm. size mirror shall be of superior glass with edge rounded & beveled as specified. It shall be free from flaws, specks, or bubbles and its thickness shall not be less than 6 mm. The glass for the mirror shall be uniformly silver plated at the back and shall be free from silvering defects. Silvering shall have a protective uniform covering of red lead paint. The 6 mm thick plywood shall conform to M-37. The 6 mm. thick A.C. sheets shall conform to M-24.

2.0. Workmanship

2.1. The mirror of 600 mm. x 450 mm. size mounted on A.C. Sheet or plywood 6 mm thick with C.P. brass clips shall be fixed as directed, by fixing wooden plugs in wall and C.P. brass screws and washers. The work shall be carried out in best workman like manner.

3.0. Mode of measurements & payment

3.1. The rate includes cost of all labour and materials, tools and plant etc. required for satisfactory completion of this item. The rate shall be for a unit of One number.

ITEM NO.91:

Constructing brick masonry for underground C.I. inspection chamber and bends with bricks having crushing strength not less than 35 kg/cm² in c:m 1 :5 C.I. cover with frame 445mm x 610mm internal dimension total weight of cover with frame to be not less than 38 kg.(wt. of cover 23 kg. and wt of frame 15 kg.) R.C.C. top slab with 1:2:4 (1 cement : 2 coarse sand : 4 grade stone aggregate 20mm size) foundation concrete 1: 5: 10 inside plaster 15 mm thick with cement mortar 1: 3 finished smooth with a floating coat of neat cement on walls and bed concrete etc. comp. (i) inside dimension 455mm X 610mm X 450mm deep.

1.0. Materials : Water shall conform to M-1. Cement shall conform to M-3. Coarse sand shall conform to M-5. Brick shall conform to M-15. Stone aggregate shall conform to M-12. Brick bat shall conform to M-14 M.S. bar shall conform to M-18.

2.0. Workmanship

2.1. C.I. inspection chamber with provision of C.I. bends of specified size with bolts, nuts and felt washers for underground drain shall be enclosed in masonry chamber which shall be constructed as under:

2.2. The excavation shall be done true to dimensions and level shown in one of the plans or as directed.

2.3. Bed concrete shall be 15. Cms, thick C.C. 1:5:10 (1 cement : 5 coarse sand : 10 graded brick bat aggregates). The projection of bed concrete beyond the masonry walls shall be 7.5 cms.

2.4. Masonry walls and plaster work shall be carried out as per relevant specifications of item 24.40.

2.5. The cover slab shall be constructed as per relevant specifications of 24.27 (I).

3.0. Mode of measurements and payment

3.1. The earth work in excavation, providing and laying C.I. inspection chamber and bends shall be measured and paid for separately.

3.2. The rate shall be for a unit of One number.

ITEM NO.92:

Providing, & laying (to level or slopes) and joining R.C.C NP2 CLASS pipe in C.M 1:1 of following nominal internal diameter with collars and butt ends prepared for collar joints including testing of pipes and joints etc. Complete

1.0. Materials : The reinforced concrete light duty non-pressure pipes of specified diameter shall conform to I.S. 458-1971.

2.0. Workmanship

2.1. The relevant specifications of item No. 24.1. A shall be followed for work of trenches except that the excavation in trenches shall be for. Reinforced concrete pipes of specified diameter.

2.2. Laying

2.2.1. The pipes shall be lowered into the trenches carefully. Mechanical appliances may be used. Where necessary pipe shall be laid in straight lines or with easy curves and true to line and gradient as specified. The laying of pipe shall proceed upgrade of a slope. In the pipe spigot and socket joints, the socket ends shall face upstream. In case of pipes with joints to be made with loose collars, the collars shall be slipped on before the next pipe is laid.

2.2.2. In case where the foundation conditions are unusual such as the proximity of trees or holes, under existing or proposed all round in 150 mm. thick cement concrete 1:5:10 (1 cement: 5 fine sand : 10 graded stone aggregate 40 mm. nominal size) or compacted sand or gravel:

2.2.3. In case where the natural foundation is inadequate the pipes shall be laid either in concrete cradle, supported on proper foundations or on any other suitably designed structure. If concrete bedding is used, the depth of concrete below bottom of the pipe shall be at least 1/4th of the internal diameter of the pipe subject to a minimum of 100 mm. and a maximum 300 mm. The concrete shall be extended up the sides of the pipe at least to a distance of 1/4th of the outside diameter for pipes 300 mm. and over in diameter.

2.2.4. The pipes shall be laid in the concrete bedding before the concrete has set. Pipes laid in trenches in earth shall be bedded evenly and firmly and as far as up to the haunches of the pipe as to safely transmit the load expected from the back fill through the pipe to the bed. This shall be done either by excavating the bottom of the trenches to fit the curve of the pipe or by compacting the earth under a round curve of the pipe to form an even bed, Necessary provision shall be made for joints wherever required.

2.3. Jointing

2.3.1. The joints shall be done by slipping the collar over and clear of the end of the pipe. The recess of the end of the pipe shall be filled with jute braiding in hot bitumen. The new pipe shall then be brought forward until the bitumen ring in recess of first pipe is set into the recess of the second pipe. The process shall be repeated for two or three pipes which shall then jacked up so as to thoroughly compress the bitumen. The quantity of jute and bitumen shall be just enough to fill the recess when pressed hard by jacking, care being taken that no offset of the jute braiding shall be visible either outside or inside of pipe. The collar shall then be set up over the joints covering equally both the pipe and leaving, an even caulking space all round. Cement and sand mortar: 1: 1.1/2 shall then be well punched or pressed home with a caulking tool within this caulking space. Care shall be taken that the underside of the joints is properly filled with mortar.

2.4. Curing

2.4.1. Every joints shall be kept wet for about 10 days for maturing. The section of the pipe line laid and jointed shall be covered immediately to protect from weather effects. Minimum bore of 100 mm. is considered adequate.

2.4.2. The joints shall be left exposed for observation.

2.5. Testing of Joints :

2.5.1. The testing of joints shall be done as per relevant specifications of item No. 24.1 (A) except that the testing of reinforced concrete pipes shall be done.

3.0. Mode of measurements & payment

3.1. The relevant specifications of item 24.1 .(A) shall be followed except that the rate includes for laying to level or slope in trenches etc. (measured separately), making the joints a; Seated and testing to stand the water test.

3.2. The measurements shall be net without any allowance for cutting and waste. The length of bends, junctions and other connections (measured along the centre line) shall be included in the total length of the pipes, the connections being numbered afterwards and paid for extra over pipes.

3.3. The size of bend, junctions, etc, shall suit the size of pipe. The bore (internal diameter of pipe) shall be the criterion for payment.

3.4. Nothing extra shall be paid separately for the use of mechanical appliances, where necessary, as described above.

3.5. The rate shall be for a unit of One running meter.

ITEM NO.93:

Providing laying and jointing in true line and level 15mm dia. U.P.V.C. Pipe (SCH- 40) for cold water including fittings make PRINCE / SUPREME / ASTRAL / FINOLEX or equivalent as approved by Engineer In Charge. Pipe shall be fixed on the wall with the help of clamp at every two metre C/C or shall be cancelled as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.

Pipes shall conform to IS 13592 : 1992 (Type A). The internal and external surfaces of the pipes shall be smooth and clean and free from grooving and other defects. The end shall be clearly cut and shall be square with the axis of the pipe. The end may be chamfered on the plain sides. Slight shallow longitudinal grooves or irregularities in the wall thickness shall be permissible provided the wall thickness remain within the permissible limit.

Colour of Pipe :

Surface colour of the pipes shall be as specified.

Marking :

Each pipe shall be clearly and indelibly marked with the following information at intervals not more than 3 metre.

(a) Manufacturer's name or trade mark.

(b) Nominal outside dia of pipe.

(c) Type 'A'

(d) Batch number.

The pipe may also be marked with standard mark.

Dimensions :

UPVC water pipes shall be of the dia, as specified and shall be in nominal lengths of 2,3,4 or 6 metres either plain or with sliding / grooved socket, unless shorter lengths are required at junctions with fittings. The sizes, weights, sockets and tolerances of pipes shall be as shown in Table 1,2,3 & 4. Tolerance on specified length shall be + 0.10mm.

TABLE -1**DIMENSIONS OF PIPES**

All Dimensions in mm

Nominal out side diameter	Mean out side diameter		Out side diameter if any point		Wall thickness S type A	
	Min	Max	Min	Max	Min	Max
75	75	75.3	74.1	75.9	1.8	2.2
100	110	110.4	108.6	111.4	2.2	2.7

TABLE -2**MINIMUM WALL THICKNESS OF SOCKETS ON PIPES**

All Dimensions in mm

Nominal Outside Diameter	S 2 Min Type A	S 3 Min Type A
75	1.6	1.0
100	2.0	1.2

TABLE -3**DIMENSIONS FOR SLIDING SOCKETS**

All Dimensions in mm

Nominal Outside Diameter	Socket Dept, C	Mean Inside Diameter of Socket at Midpoint, DI	
		Min	Max
75	40	75.1	75.3
110	48	110.1	110.4

TABLE -4**DIMENSIONS OF GROOVED SOCKET**

All Dimensions in mm

Nominal Outside	Inside Diameter of Socket, D1	Inside Diameter of Beading, D2	Length of Beading	Neck of Socket	Length beyond
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Diameter					and Neck A	B	beading C
	Min	Max	Min	Max	Min	Max	Min
75	75.3	76.2	84.5	85.5	20	5	35
100	110.4	111.3	120.3	121.3	26	6	32

Fixing and Jointing

Pipes shall be either fixed on face of wall or embedded in masonry as specified.

Plain pipes shall be secured to the walls at all joints with PVC pipe clips by means of 50 x 50x 50 mm hard wood plugs, screwed with MS Screws of required length including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand). The clips shall be kept about 25mm clear off finished face of wall, so as to facilitate cleaning of pipes.

Pipes shall be fixed perfectly vertical or to the lines as directed. The pipes shall be fitted to fittings with seal ring conforming to IS : 5382 allowing 10mm gap for thermal expansion.

Installation in Wall/Concrete:

The walls/concrete slots should allow for a stress free installation. Pipes and fittings to be inserted into the slots without a cement base, have to be applied first with a thin coat of PVC solvent cement followed by sprinkling of dry sand (medium size) and then allowed to dry. The process gives a sound base for cement fixation. This process is repeated while joining PVC material to CI/AC materials.

Fittings :

Fittings used shall be of the same make as that of the PVC pipes and shall have a minimum wall thickness of 3.2mm. The fittings shall be supplied with proved socketted ends with square grooves and provided with Rubber Gasket conforming to IS : 5382. The plain ends of the fittings should be chamfered. The fittings shall be joined with the help of Rubber lubricant.

Note : These pipes shall be used only in shaft or unexposed location to avoid damage to these pipes due to willful act.

Method of Measurement And Payment

The measurement shall be recorded in running meter of pipe length laid along the centerline of axis of pipeline including tees, enlarges, reducers and bends, correct up to 0.01 m length. No payment shall be made for overlaps etc. The payment shall be made after completion of whole made item as mentioned in price bid on Running Meter basis and 15% shall be withheld for satisfactory hydraulic testing.

The rate includes cost of all materials, tools, plants and labour involved in satisfactory completion of work as specified above.

The rate shall be for a unit of one Rmt of actual work done.

ITEM NO.94:

Providing laying and jointing in true line and level 25mm dia. U.P.V.C. Pipe (SCH- 40) for cold water including fittings make PRINCE / SUPREME / ASTRAL / FINOLEX or equivalent as approved by Engineer In Charge. Pipe shall be fixed on the wall with the help of clamp at every two metre C/C or shall be cancelled as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.

The relevant specification of Item no 93 shall be followed but dia of pipe is 25 mm.

ITEM NO.95:

Providing laying and jointing in true line and level 40mm dia. U.P.V.C. Pipe (SCH- 40) for cold water including fittings make PRINCE / SUPREME / ASTRAL / FINOLEX or equivalent as approved by Engineer In Charge. Pipe shall be fixed on the wall with the help of clamp at every two metre C/C or shall be cancelled as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.

The relevant specification of Item no 93 shall be followed but dia of pipe is 40 mm.

ITEM NO.101:

Providing & fixing G.I. Rain water spout of 50 mm dia & 30 cm length etc.

1.0. Materials : G.I.M.S. type of 50 mm. dia. shall conform to M-56.

2.0. Workmanship

2.1. The G.I. pipe of 30 cms. fixed as rain water pipe as directed. The pipe shall be fixed about 1/4 dia. below the floor level so as to make approach of water easy. The inlet of pipe shall be rounded off for easy entry of rain water pipe. The pipe shall be fixed in C.M. 1:3.

3.0. Mode of measurements & payment

3.1. The rate includes of all labour and materials required for satisfactory completion of this item.

3.2. The rate shall be for a unit of One number.

ITEM NO.102

Providing and fixing in position P.V.C. cowl vent to pipes of prince, suprim, jain make etc. comp. (b)100 mm dia.

Materials:

Cowl vent shall conform to I.S.1626:1960 for pipes fixing P.V.C. pipe cowl vent conform to M-68-A.

Workmanship:

Cowl vent diameter size and type shall be specified in the item. All cowl vent shall be fixed at location indicated on drawings or as directed by Engineer-in-charge. Cowl vent shall be secured to face of wall below all joints by M.s.clamps with wooden gutties.

Mode of measurement and payment :

The rate includes all labor materials tools and plants etc. required for satisfactory completion of this item. The rate shall be for a unit of one number.

ITEM NO.103:

Providing erecting and fixing double coated Syntex or equivalent PVC (ISI) mark water tank of required capacity each with all necessary fitting and connection etc. comp on terrace.

PVC Water tank of specified capacity and of I.S.I. mark of approved in liters of approved make and quality equivalent to syntax product. Net capacity shall be net volume of water stored between the lowest level of overflow and lowest specified level.

Nipple

Galvanize pipe nipple shall be of approved make and of best quality Relevant specification given in Booklet of Building specification shall be applied for the execution of this item

Ball valve

Ball valve shall confirm specification no 23.00.5 (A) on page 172 of specification booklet for building works.

Ball valve shall be of approved make and of best quality. Relevant specification given in Booklet of Building specification shall be applied for the execution of this item

Connections

Connections shall be of approved make and of best quality. Relevant specification given in Booklet of Building specification shall be applied for the execution of this item

Workman Ship

Tank shall be approved quality and as per IS standard make. Material used in manufacturing tank shall be confirmed to relevant IS code. The material of tank and lead and fittings which may come in contact of water should be such that it does not impart any taste, colour or odor. It does not have any toxic effect and it does not contaminate the water. Thereby making it unpotable.

The tank shall be fixed properly in a level position and making all required necessary correction like inlet outlet flushing overflow and air vent. Tank shall be satisfying the standards of public health.

The item includes two coats of silver paint to outside of water tank.

Mode of Measurement & Payment:

The payment will be made on capacity in litter's basis of the finished work.

All necessary labour materials Equipment tools and plant, conveyance including loading and unloading etc shall be provided by the Contractor as directed by the Engineer in charge
The item shall be measured for its capacity in litters limiting dimensions to those specified on plan or as directed.
The rate shall be for a unit of one Litter.

ITEM NO.107:

Box cutting the road surface to proper slope & camber for making a base for road work including removing the excavated stuff, and depositing on the road side slopes as directed up to 50 Mt. lead

1. Specification No. 162 and 553 of P.W.D. Hand Book volume II and the following additional specifications shall be here.
2. Cutting shall be done in proper grade & camber as per measurements given. Care must be taken the tall slopes are evenly and truly dressed. Cutting shall be done to the exact depth required and shall be as per formation level in proper grade and the camber. If extra depth of cutting is done due to negligence of contractor the same shall be refilled with approved quality of materials duly consolidated to the satisfaction of the Engineer-in-charge (without extra cost) Box cutting for soling and metalling in required width the depth shall be done.
3. The stuff received from the cutting shall be utilized for filling cuts and correcting side slopes of bank with all lead and lift directed. Useful Stuff shall be carefully stacked separately as directed,
4. The measurement shall be taken as per cross section measurement of the cutting based on length,breadth, depth measured with tape at every 25 metres interval.
5. The payment shall be made on Cmt. basis.

Item No.108

Rolling and Consolidating of soling including filling in depression which occurs during the process with power roller 8 tonne to 12 tonne. and compacting the bed as per specifications to core test 97% compacting complete in all respects to the entire satisfaction of the Engineer-in -charge.

1.0 Rolling

Rolling shall be done with a 8-12 tonne power roller. Rolling is continued ll the required density achieved is at least 98 % of MDD the material determined by Proctor density as per IS 2720 Pt.VII) and a smooth surface obtained without leaving any roller marks on the surface. During rolling surface should be checked for grade and camber and irregularities corrected.

1.1 Curing

The compacted surface shall be cured for a minimum period of 7days before the next layer is placed. Curing is done by sprinkling water over the surface five or six times a day. The surface shall not be allowed to dry during the curing period. Curing by ponding shall not be adopted.

1.2 Surface Irregularities

The finish surface should be checked for line, level and grade and surface finish. The maximum permissible undulation in longitudinal profile shall not exceed 15 mm when checked with 3 meter straight edge and in cross profile the variation from specified profile shall not exceed 12 mm.

2.0 Measurements and Payment: -

- 2.1 The length and breadth shall be taken to the nearest centimetre. The consolidated net plane area shall be calculated in square metres, correct to two places of decimals.
- 2.2 The rate shall be for a unit of one square meter.
- 2.3 The contract unit rate includes cost of mechanical roller required for consolidation including all labour, equipments fuel, hire charges, tolls, and incidentals necessary.

ITEM NO.109:

Providing and fixing pre- cast concrete kerb stone of gray cement based concrete block 30 cm length, 30 cm height and 15cm thick of 250 grade concrete as per approved design and including excavation for fixing in proper line and level, fillig the joint with C: M 1:3 (1 Cement : 3 Fine Sand) etc. complete

1.0 Material:

Water shall confirm to M-1, sand shall confirm to M-6, Cement shall confirm to M-3. Pre-cast concrete kerb stone of gray cement based concrete block 35cm length, 30cm height and 15cm thick of M250 grade concrete approved shape.

2.0 Workmanship:

Sub grade shall be cleaned, levelled, wetted and rammed as directed. kerb stone of approved colour, shape and size, shall be laid in different pattern/design as shown in the drawing or as directed by Consulting Architect/Engineer in charge as directed on top, pressed, tapped gently to bring it in line and level and inter lock with others. The joint shall be as fine as possible. The finished surface shall be true to levels and slopes as directed. Necessary testing of blocks is to be carried out.

3.0 Mode of Measurement and Payments:

The rate shall include the cost of all materials and labour involved in all the operations described above. The rate shall be for a unit of running meter.

Item No :-110

Providing, laying, spreading and consolidation graded stone aggregate to wet mix macadam 150mm compacted thick as per MORT & H specifications including premixing the material with water at OMC in mechanical plant carriage of mixed material by tippers to site, laying in uniform layers with paver in sub base/ base course on well prepared surface and compacting with vibratory roller to achieve the desired density.

406.1 SCOPE

This work shall consist of laying and compacting clean, crushed, graded aggregate and granular material, premixed with water, to a dense mass on a prepared subgrade sub base/ base or existing pavement as the case may be in accordance with the requirements of these specifications. The material shall be laid in one or more layers as necessary to lines, grades and cross-sections shown on the approved drawings or as directed by the Engineer. The thickness of a single compacted Wet Mix Macadam layer shall not be less than 75mm. When vibrating or other approved types of compacting equipment are used, the compacted depth of a single layer of the sub-base course may be increased to 20cm upon approval of the Engineer.

406.2 MATERIALS

406.2.1 AGGREGATES

406.2.1.1 PHYSICAL REQUIREMENTS :

Course aggregates shall be crushed stone. If crushed gravel / shingle is used, not less than 90 percent by weight of the gravel / shingle pieces retained on 4.75 mm sieve shall have at least two fractured faces. The aggregates shall conform to the physical requirements set forth in Table 400-10 below.

TABLE 40-10 PHYSICAL REQUIREMENT OF COARSE AGGREGATES FOR WET MIX MACADAM FOR SUB-BASE / BASE COURSES

Test	Test Method	Requirements
1.*Los Angeles Abrasion value	IS : 2386 (Part-4)	40 percent (Max)
Aggregate impact value	IS : 2386 (Part-4) or IS : 5640	30 percent (Max)
2. Combined Flakiness and Elongation indices (Total)**	IS : 2386(PART-1)	30 percent (Max)

* Aggregates may satisfy requirements of either of the two tests.

** To determine this combined proportion, the flaky stone from a representative sample should first be separated out. Flakiness index is weight of flaky stone metal divided by weight of stone sample only the elongated particles be separated out from the remaining (non flaky stone metal. Elongation index is weight of elongated particles divided by total non flaky particles. The value of flakiness index and elongation index so found are added up.

If the water absorption value of the coarse aggregate greater than 2 percent, the soundness test shall carried out on the material delivered to site as per 2386 (Part – 5).

406.2.1.2 Grading requirements :

The aggregates shall conform to the grading given in Table 400-11

TABLE 400-11. GRADING REQUIREMENTS OF AGGREGATES FOR WET MIX MACADAM.

Is Sieve Designation	Percent by weight Passing the IS sieve
53.00 mm	100
45.00 mm	95-100
26.50 mm	-
22.40 mm	60-80
11.20 mm	40-60
4.75 mm	25-40
2.36 mm	15-30
600.00 micron	8-12
75.00 micron	0-8

Materials finer than 425 micron shall have plasticity index (P.I) not exceeding 6.

The final gradation approved within these limits shall be well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve or vice- versa.

406.3 Construction Operation :

406.3.1 Preparation of base : Clause 404.3.1 as below shall apply.

404.3.1 Preparation of base: The surface of the subgrade/sub-base/base to receive the water bound macadam course shall be prepared to the specification lines and cross fall(camber) and made free of dust and other extraneous material. Any ruts or soft yielding places shall be corrected in an approved manner and rolled unit firm surface is obtained if necessary by sprinkling water. Any sub-base/base/surface irregularities, where predominant, shall be made good by proving appropriate type of profile corrective course(levelling course) to clause 501 of these specification.

As far as possible, laying water bound macadam course over an existing thick bituminous layer may be avoided since it will cause problems of internal drainage of the pavement at the interface of two course. It is desirable to completely pick out the existing thin bituminous wearing course where water bound macadam is proposed to be laid over it. However, where the intensity of rain is low and the interface drainage facility is efficient, water bound macadam can be laid over the existing thin bituminous surface by cutting 50 mm x 50 mm furrows at an angle of 45 degrees to the centre line of the pavement at one metre intervals in the existing road. The directions and depth of furrows shall be such that they provide adequate bondage and also serve to drain water to the existing granular base course beneath the existing thin bituminous surface.

406.3.2 Provision of lateral confinement of aggregates :

While constructing wet mix macadam arrangement shall be made for the lateral confinement of wet mix. This shall be done by laying materials in adjoining shoulders along with that of wet mix macadam layer and following the sequence of operations described in Clause 407.4.1 as below.

407.4 Construction Operations:

407.4.1 Shoulder: The sequence of operations shall be such that the construction of paved shoulder is done in layers each matching the thickness of adjoining pavement layer . Only after a layer of pavement and corresponding layers in paved and earth shoulder portion have been laid and compacted, the construction of next layer of pavement and shoulder shall be taken up.

Where the materials in adjacent layers are different ,these shall be lad together and the pavement layer shall be compacted first. The corresponding layer in paved shoulder portion shall be compacted thereafter, which shall be followed by compaction of earth shoulder layer. The adjacent layers having same material shall be laid and compacted together.

In all cases where paved shoulders have to be provided along side of existing carriageway, the existing shoulders shall be excavated in full width and to the required depth as per clause 301.3.7 under no circumstances, box cutting shall be done for construction of shoulders.

Compaction requirement of earthen shoulder shall be as per table 300-2 in the case of bituminous courses, work on shoulder(earthen/hard/paved), shall start only after the pavement course has been laid and compacted.

During all stages of shoulder (earth/hard/paved) construction, the required cross fall shall be maintained to drain off surface water

Regardless of the method of laying, all shoulder construction material shall be placed directly on the shoulder. Any spilled material dragged on to the pavement surface shall be immediately removed, without damage to the pavement, and the area so affected thoroughly cleaned.

406.3.4 Preparation of mix :

Wet Mix Macadam shall be prepared in an approved mixing plant of suitable capacity having provision for controlled addition of water and forced / positive mixing arrangement like pug-mil or pan type mixer of concrete batching plant.

Optimum moisture for mixing shall be determined in accordance with IS : 2720 (Part – 8) after replacing the aggregate fraction retained on 22.4 mm sieve with material of 4.75 micron to 22.4 mm size. While adding water, due allowance should be made for evaporation losses. However, at the time of compaction, water in the wet mix should not vary from the optimum value by more than agreed limits. The mixed material should be uniformly wet and so segregation should be permitted.

406.3.4 Spreading of mix :

Immediately after mixing, the aggregates shall be spread uniformly and evenly upon the prepared sub grade / sub-base / base in required quantities. In no case should these be dumped in heaps directly on the area where these are to be laid nor shall their hauling over a partly completed stretch be permitted.

The mix may be spread either by a paver finisher or motor grader. For portions where mechanical means cannot be used, manual means as approved by the Engineer shall be used. The motor grader shall be capable of spreading the material uniformly all over the surface. Its blade shall have hydraulic control suitable for initial adjustments and maintaining the same so as to achieve the specified slope and grade.

The paver finisher shall be self – propelled, having the following features :

- (i) Loading hoppers and suitable distribution mechanism
- (ii) The screed shall have tamping and vibrating arrangement for initial compaction to the layer as it is spread without rutting or otherwise marring the surface profile.
- (iii) The paver shall be equipped with necessary control mechanism so as to ensure that the finished surface is free from surface blemishes.

The surface of the aggregate shall be carefully checked with templates and all high or low spots remedied by removing or adding aggregate as may be tested by depth blocks during construction.

No segregation of larger and fine particles should be allowed. The aggregates as spread should be allowed. The aggregates as spread should be of uniform gradation with pockets of fine materials.

406.3.5 Compaction :-

After the mix has been laid to the required thickness, grade and camber the same shall be uniformly compacted, to the full depth with suitable roller. If the thickness of single compacted layer does not exceed 100mm, as smooth wheel roller of 80 to 100 KN weight may be used. For a compacted single layer up to 200mm, the compaction shall be done with the help of vibratory roller of minimum static weight of 80 to 100 KN or equivalent capacity roller. The speed of the roller shall not exceed 5 km/h. In portions having unidirectional cross fall / super elevation rolling shall commence from the lower edge and progress gradually towards the upper edge. Thereafter, roller should progress parallel to the center line of the road. Uniformly over-lapping each preceding track by at least one fourth width until the entire surface has been rolled. Alternate trips of the roller shall be terminated in stops at least 1 m away from any preceding stop.

In portions in camber, rolling should be at the edge with the roller running forward and backward until the edges have been firmly compacted. The roller shall progress gradually towards the center parallel to the center line of the road uniformly overlapping each of the preceding track by at least one – Fourth width until the entire surface has been rolled.

Any displacement occurring as a result of reversing of the direction of a roller or from any other cause shall be corrected at once as specified and / or removed and made good.

Along forms, Kerbs, walls or other places not accessible to the roller, the mixture shall be thoroughly compacted with mechanical tampers or a plate compactor. Skin patching of an area without scarifying the surface to permit proper bonding of the added material shall not be permitted.

Rolling should not be done when the sub grade is soft or yielding or when it caused a wave-like motion in the sub – base/ base course or sub grade. If irregularities develop during rolling which exceed 12mm when tested with a 3 meter straight edge, the surface should be loosened and premixed material added or removed as required before rolling again so as to achieve a conforming to the desired grade and cross fall. In no case should the use of unmixed material be permitted to make up the depressions.

Rolling shall be continued till the density achieved is at least 98 per cent of the maximum dry the material as determined by the method outlined in IS : 2720 (Part-8)

After completion, the surface of any finished layer shall be well-close, free from movement under compaction equipment or any compaction planes, ridges, cracks and loose material. All loose, segregated or otherwise defective areas shall be made good to the full thickness of the layer and re-compacted.

406.3.6 Setting and drying :

After final compaction of wet mix macadam course, the road shall be allowed to dry for 24 hours.

406.4 Opening to Traffic :

Preferably no vehicular traffic of any kind should be allowed on the finished wet mix macadam surface till it has dried and the wearing course laid.

406.5 Surface Finish and Quality control of work

406.5.1 Surface evenness :

The surface finish of construction shall conform to the requirements of Clause 902 of MORT & H specifications.

406.5.2 Quality Control :

Control on the quality of materials and works shall be exercised by the Engineer in accordance with section 901 of MORT & H specifications

406.6 Rectification of Surface Irregularity :

Where the surface irregularity of the wet mix macadam course exceeds the permissible tolerances or where the course is otherwise defective due to subgrade soil getting mixed with the aggregates, the full thickness of the layer shall scarified over the affected area. Reshaped with added premixed material or removed and replaced with fresh premixed material as applicable and recomputed in accordance with Clause 406.3 of this item . The area treated in the aforesaid manner shall not be less than 5m long and 2m wide. In no case shall depressions be filled up with unmixed and ungraded material or fines.

406.6.7 Arrangement for Traffic :

During the period of construction, arrangement of traffic shall be done as per Claus 112 of MORT & H specifications

406.8 Measurements for Payment :

Wet mix macadam shall be paid as finished work in position on cross sectional measurements and computing the volume of WMM work in cubic meters by average area method.

406.9 Rate : The Contract unit rate for wet mix macadam shall be payment in full for carrying out the required operations including full compensation for all components listed below.

- i) Making arrangement for traffic to Clause 112 as above Except for initial treatment to verges, shoulders and Construction of diversions :
- ii) Furnishing wet materials o be incorporated in the work including all royalties, fees, rents where necessary and all leads and lifts ;
- iii) All labour, tools, equipment and incidentals to complete the work to the specifications
- iv) Carrying out the work in part widths of road where directed ; and
- v) Carrying out the required tests for quality control.

The payment shall be made on Cum basis.

Item No :-111

Providing & laying of specified compacted thickness Granular sub base (GSB) in specified grading in table 400-1 of the specification MORT&H and compactor to the required density with 8 - 10 tonne vibratory roller with plain drum or heavy pneumatic tyred roller of minimum 200 to 300 KN weight in all seasons as per MORT&H , maintaining the required slope & grade during the operation as approved by the engineer in charge & watering to the proper moisture content and sprinkled with the help of truck mounted water tank fitted with suitable arrangement .(fully saturated having CBR value greater or equal to 30) compacted thickness of 150 mm consisting of Machine crust stone aggregate as per grading 1 in table 400-1 of the specification MORT&H fifth Revision

SCOPE This work shall consist of laying and compacting well-graded material on prepared subgrade in accordance with the requirements of Specifications. The material shall be laid in one or more layers as sub-base or lower sub-base and upper sub-base (termed as sub base hereinafter) as necessary according to lines, grades and cross sections shown on the drawings or as directed by the Engineer.

2 MATERIALS

2.1 The material to be used for the work shall be natural sand, gravel, crushed stone, or combinations thereof depending upon the grading required. The material shall be free from organic or other deleterious constituents and conform to grading (given below). While the gradings in Table -1 are in respect of close-graded granular sub-base materials, one each for maximum particle size of 75 mm, 53 mm and 26.5 mm, the corresponding gradings for the coarse-graded materials for each of the three maximum particle sizes are given at Table -2. The grading to be adopted for a project shall be as specified in the Contract.

2.2 Physical requirements The material shall have a 10 per cent fines value of 50 kN or more (for sample in soaked condition) when tested in compliance with BS : 812 (Part 111). The water absorption value of the coarse aggregate shall be determined as per IS :2386 (Part 3); if this value is greater than 2 per cent, the soundness test shall be carried out on the material delivered to site as per IS : 383. For Grading II and III materials, the CBR shall be determined at the density and moisture content likely to be developed in equilibrium conditions which shall be taken as being the density relating to a uniform air voids content of 5 per cent.

S. No.	Item	Ref. Code	Frequency
1	Granular Sub Base		
1.1	Gradation	IS:2720 (Part 4)	1 Tests/400 m ³
1.2	Atterberg's limits	IS:2720 (Part 5)	1 Tests/400 m ³
1.3	Moisture Content prior to compaction	IS:2720 (Part 2)	1 Tests/400 m ³
1.4	Field Density of compacted layer	IS:2720 (Part 28)	1 Tests/1000 m ³
1.5	Deleterious content test	IS:2720 (Part 27)	As required
1.6	CBR	IS:2720 (Part 16)	Minimum 30%, as required.

Table 400-1 : Grading for Granular Sub-base Materials

IS Sieve Designation	Percent by Weight Passing the IS Sieve					
	Grading I	Grading II	Grading III	Grading IV	Grading V	Grading VI
75.0 mm	100	-	-	-	100	-
53.0 mm	80-100	100	100	100	80-100	100
26.5 mm	55-90	70-100	55-75	50-80	55-90	75-100
9.50 mm	35-65	50-80	-	-	35-65	55-75
4.75 mm	25-55	40-65	10-30	15-35	25-50	30-55
2.36 mm	20-40	30-50	-	-	10-20	10-25
0.85 mm	-	-	-	-	2-10	-
0.425 mm	10-15	10-15	-	-	0-5	0-8
0.075 mm	<5	<5	<5	<5	-	0-3

3 STRENGTH OF SUBBASE

3.1 It shall be ensured prior to actual execution that the material to be used in the sub-base satisfies the requirements of CBR and other physical requirements when compacted and finished

3.2 When directed by the Engineer, this shall be verified by performing CBR tests in the laboratory as required on specimens remoulded at field dry density and moisture content and any other tests for the “quality” of materials, as may be necessary.

4 CONSTRUCTION OPERATIONS

4.1 Preparation of sub grade Immediately prior to the laying of sub-base, the subgrade already finished as applicable shall be prepared by removing all vegetation and other extraneous matter, lightly sprinkled with water if necessary and rolled with two passes of 8 -10 Ton smooth wheeled roller.

4.2 Spreading and compacting The sub-base material of grading specified in the Contract shall be spread on the prepared sub grade with the help of a motor grader of adequate capacity, its blade having hydraulic controls suitable for initial adjustment and for maintaining the required slope and grade during the operation or other means as approved by the Engineer.

When the sub-base material consists of combination of materials mentioned above, mixing shall be done mechanically by the mix-in-place method.

Manual mixing shall be permitted only where the width of laying is not adequate for mechanical operations. The equipment used for mix-in-place construction shall be a rotator or similar approved equipment capable of mixing the material to the desired degree. If so desired by the Engineer, trial runs with the equipment shall be carried out 9 of 9 to establish its suitability for the work.

Moisture content of the loose material shall be checked in accordance with IS : 2720 (Part II) and suitably adjusted by sprinkling additional water from a truck mounted or trailer mounted water tank and suitable for applying water uniformly and at controlled quantities to variable widths of surface or other means approved by the Engineer so that, at the time of compaction it is from 1 per cent above to 2 per cent below the optimum moisture content corresponding to IS : 2720 (Part VIII). While adding water, due allowance shall be made for evaporation losses. After water, has been added, the material shall be

processed by mechanical or other approved means like disc harrows, rotators until the layer is uniformly wet. Immediately thereafter, rolling shall start. If the thickness of the compacted layer does not exceed 100 mm, a smooth wheeled roller of 8 to 10 Ton weight may be used. For a compacted single layer upto 225 mm the compaction shall be done with the help of a vibratory roller of minimum 8 to 10 Ton static weight with plain drum or pad foot drum or heavy pneumatic tired roller of minimum 200 to 300 kN weight having a minimum tyre pressure of 0.7 MN/m² or equivalent capacity roller capable of achieving the required compaction. Rolling shall commence at the lower edge and proceed towards the upper edge longitudinally for portions having unidirectional cross fall and super elevation and shall commence at the edges and progress towards the center for portions having cross fall on the both sides.

Each pass of the roller shall uniformly overlap not less than one third of the track made in the preceding pass. During rolling, the grade and camber shall be checked and any high spots or depressions which become apparent corrected by removing or adding fresh material. The speed of the roller shall not exceed 5 km per hour.

Rolling shall be continued till the density achieved is at least 98% of the maximum dry density for the material determined as per IS : 2720 (Part 7). The surface of any layer of material on completion of compaction shall be well closed, free from movement under compaction equipment and from compaction planes, ridges, cracks or loose material. All loose, segregated or otherwise defective areas shall be made good to the full thickness of layer and re-compacted.

4.3 Surface Finish and quality Control of Work

The finished surface shall be checked for lines, levels and regularity. The surface evenness of completed surface in longitudinal and transverse direction shall be within the tolerances specified.

5 MODE OF MEASUREMENTS:

The surface finish of construction shall conform to the requirements. Granular sub-base shall be measured as finished work in position in cubic meters.

ITEM NO.112:

Providing and fixing pre-cast Rubber Dye / steel Dye inter locking concrete block 60mm thick with grade of concrete M300 pneumatic compressed / vibrated mechanically and as per approved design Confirming to IS 15658 : 2006 including 35 mm Sand layer for levelling and filling the joint with sand in proper line and level as per guidelines of IRC : SP 63- 2018 etc. Complete.

1.0 Material:

The concrete pavers should have perpendicularities after release from the mould and the same should be retained until laying.

The surface should be anti skid and anti flare type.

The pavers should have uniform special chamfers to facilitate easy drainage of surface run off.

The pavers should have uniform interlocking space of 2 to 3mm. to ensure compacted sand filling after vibration of the paver surface.

The pavers should have the following Engineering properties when tested as per IS 2185.

Crushing strength - minimum 300 kg. per sq.cm.

% of water absorption - 3% max.

Abrasion resistance - As per relevant IS codes.

The ingredients of pavers shall meet the specifications of relevant IS code (IS 15685-2006)

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2.0 Workmanship:

Providing & fixing 60 mm thick rubber mould inter locking paver blocks using concrete grade M:250 for heavy pedestrian movement (in different colour combination) to be used in the walk way areas on 75 mm thick sand layer including compacting the pavers with mechanical compactor & joint filling with fine sand as approved by the Architect or Engineer – in – charge

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3.0 Mode of Measurement and Payments:

The rate shall be for a unit of one square meter.

Item No:-113

Dry Lean Cement Concrete Sub- base (Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 150 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver with electronic sensor, compacting with 8-10 tonnes vibratory roller, finishing and curing.

Scope-

DLC acts as a sub-base for the cement concrete pavements or pavement quality concrete (PQC) DLC material has no slump i.e. zero slump

Material

Cement

Any of the following type of cement may be used with **prior approval of the Engineer in charge.**

S. No.	Type	Conforming to
i)	Ordinary Portland Cement 43 Grade	IS:8112
ii)	Portland Slag Cement	IS:455
iii)	Portland Pozzolana Cement	IS:1489-Part I

If the subgrade soil contains soluble sulphates in a concentration more than 0.5%, sulphate resistant cement conforming to IS:6909 shall be used.

Aggregate

Aggregate for lean concrete shall be natural material complying with IS:383. Aggregate shall not be alkali reactive. In case engineer consider that the aggregates are not free from dirt, the same may be washed and drained for at least 72 hours before batching, or as directed by the engineer.

Coarse aggregate

Coarse aggregate shall consist of clean, hard, dense, strong, durable and non-porous pieces of crushed stone and crushed gravel and shall be devoid of pieces of disintegrated stone, soft flaky, elongated, very angular, splintery pieces. The Max. size of aggregate is 26.5 for pavement concrete. No aggregate which has water absorption more than 2% shall be used in concrete mix. The aggregate shall be tested for soundness in accordance with IS:2386(part-5). After 5 cycle of testing, the loss shall not be more than 12%, If sodium sulphate solution is used, 18% If magnesium sulphate solution is used. The combined flakiness index and elongation index of aggregate shall not be more than 35% and the Los Angeles abrasion value shall also not be exceed 35.

The aggregate gradation shall comply with Table 600-1 given below..

Table 600-1 aggregate gradation for Dry Lean concrete (DLC)

Sieve Designation	Percentage by weight passing the sieve
26.5 mm	100
19.0 mm	75-95
9.50 mm	50-70
4.75 mm	30-55
2.36 mm	17-42
600 micron	08-22
300 micron	07-17
150 micron	02-12
75 micron	0-10

Fine aggregate

The fine aggregate shall consist of clean natural sand and crushed stone sand or a combination of the two and shall conform to IS :383. Fine aggregate shall be free from soft particles, clay, shale, loam, cemented particles, mica and

organic and other foreign matter. The fine aggregate shall have a sand equivalent value of not less than 50 when tested in accordance with the requirement of IS:2720 (part 37).

Water

Water used for mixing and curing shall be clean and free from injurious amounts of oils, acids, alkalis, salts, sugar, organic materials or other substances that may be deleterious to concrete or steel. Potable water is generally considered satisfactory for mixing concrete. Water found satisfactory for mixing is also suitable for curing of concrete.

Moisture Content

The optimum water content shall be determined and demonstrated by rolling during trail length construction and the optimum moisture content and degree of compaction shall be got approved by the engineer. While laying in main work, the lean concrete shall have a moisture content between the optimum and optimum +2 percent, keeping in view the compaction and compensate evaporation losses.

Cement Content

Cement content in DLC shall be such that the strength specified in concrete strength (Next point) is achieved. The minimum cement content shall be 150 kg/cu.m of concrete. In case fly ash is blended at site as part replacement of cement, the quantity of fly ash shall not be more than 20% by weight of cementitious material and the content of OPC (Ordinary Portland Cement) shall not be less than 120 kg/cu.m.

Concrete Strength

The average compressive strength of each consecutive group of 5 cubes shall not be less than 10 MPa at 7 days. In addition, the minimum compressive strength of each cube shall not be less than 7.5 MPa at 7 days. The design mix shall be got approved from the engineer and demonstrated in the trail length construction.

Construction of DLC Layer (Construction Procedure)

The DLC shall be laid on the prepared granular drainage layer. The dry lean concrete (DLC) sub-base shall be overlaid with concrete pavement (viz. Pavement quality Concrete (PQC)) only after 7 days of sub base construction.

Batching and Mixing & Transporting

Plant mix lean concrete shall be transported in tipping trucks at the required point and discharged immediately. Protection from weather is done by covering the tipping trucks with tarpaulin during transit. Each tipping truck shall be washed with water jet before next loading.

Placing

Lean concrete shall be placed by a paver with electronic sensor on the drainage layer or as specified in the contract. DLC material shall be laid in one layer in even manner without segregation with suitable equipments. The paver machine shall have high amplitude tamping bars to give good initial compaction to the sub-base. One day before placing of the DLC sub base, the surface of the granular sub base /drainage layer shall be given a fine spray of water and rolled with smooth wheeled roller. Preferably the lean concrete shall be placed and compacted across the full width of the two lane carriage way by constructing it one go. In roads with carriage way more than 2 lanes a longitudinal joint shall be provided. Transverse butt type joint shall be provided at the end of the construction in a day. The DLC shall be laid in such way that it is at least 750 mm wider on each side than the proposed width including paved shoulder of the concrete pavement.

Compaction

The shall be carried out immediately after the material is laid and levelled. Rolling shall be continued on the full width till there is no further visible movement under the roller and the surface is well closed.

The minimum dry density obtained shall not be less than 98% of that achieved during the trail length construction (of max dry density). The density achieved at the edge i.e. 0.5 meter from the edge shall not be less than 96% of the that achieved during the trail length construction (of max dry density). The spreading, compacting and finishing of the lean concrete shall be carried out as soon as possible and time between the mixing of first batch of concrete in any transverse section of the layer and the final finishing of the same shall not exceed 90 minutes when the temperature of concrete is between 25°C and 30°C, and 120 minutes if less than 25°C. This period may be reviewed by the Engineer in the light of the results of the trial run but in no case shall it exceed 120 minutes. Work shall not proceed when the temperature of the concrete exceeds 30°C. If necessary, chilled water or addition of ice may be resorted to for bringing down the temperature. It is desirable to stop concreting when the ambient temperature is above 35°C. After compaction has been completed, roller shall not stand on the compacted surface for the duration of the curing period except during commencement of next day's work near the location where work was terminated the previous day.

Double drum smooth-wheeled vibratory rollers of minimum 80 to 100 kN static weight are suitable for rolling dry lean concrete.

The number of passes required to obtain maximum compaction depends on the thickness of the dry lean concrete. Except on super elevated portions where rolling shall proceed from the inner edge to the outer, rolling shall begin from the edges gradually progressing towards the centre. First, the edge/edges shall be compacted with a roller running forward and backward. The roller shall then move inward parallel to the centerline of the road, in successive passes uniformly lapping preceding tracks by at least one half width. A preliminary pass without vibration to bed the Dry Lean Concrete down shall be given followed by the required number of passes to achieve the desired density and, a final pass without vibration to remove roller with vibration marks and to smoothen the surface.

For repairing honeycombed/hungry surface, concrete with aggregates of size 10 mm and below shall be spread and compacted as per Specifications. Any level/thickness deficiency shall be corrected after applying concrete with aggregates of size 10 mm and below after roughening the surface. Surface regularity also shall be checked with 3 m straight edge.

Joints

Transverse butt type joint shall be provided at the end of the construction in a day. Longitudinal construction joint shall be provided only when full width paving is not possible. Transverse joints in Dry Lean concrete shall be staggered from the construction butt type joint in Concrete pavement by 800-1000 mm. Longitudinal joint in Dry Lean Concrete shall be staggered by 300-400 mm from the longitudinal joint of concrete pavement

Curing

As soon as the lean concrete surface is compacted, curing shall commence.

Curing may be done by covering the surface by gunny bags/hessian, which shall be kept wet continuously for 7 days by sprinkling water.

Measurement for Payment

The unit of measurement for dry lean concrete pavement shall be in cubic metre of concrete placed, based on the net plan area for the accepted thickness shown on the drawings or as directed by the Engineer.

Item No :-114

Cement Concrete Pavement: Providing and Laying of un-reinforced, dowel jointed, M250 pavement cement concrete pavement over a prepared sub base with 53 grade cement with coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing Compound, finishing to lines.

Scope of Work:

This methodology shall be applicable for construction of dowel jointed or plain cement concrete pavement in accordance with the lines, grades, camber and thickness as shown in the drawings using fixed forms.

1.0 Material:

2.0 Cement:

These shall consist of Ordinary Portland Cement from approved source. The minimum cement content shall be 400 Kg/cum. However, optimum cement content shall be determined by carrying out concrete mix design in accordance with IRC: 44-2008 and establishing a job mix formula, approval of which shall be obtained from EIC

Admixtures:

The admixtures shall conform to IS 6925 and IS 9103 shall improve the workability of concrete or extension of time and they will not have any effect on the properties of concrete. The performance of these admixtures will be proved both on laboratory trials and in trial paving works. The admixtures containing calcium chloride shall not be used.

Aggregates:

The aggregates shall be of crushed stone or Crushed gravel, conforming to IS 383. The coarse aggregates shall be clean, hard, strong, dense and durable of crushed stone. The Los Angeles Abrasion value shall not be more than 35%. The fine aggregate shall be of clean natural sand or crushed stone sand or combination of both. These shall be free from clay, shale, loam, mica and other organic matter. The limit of deleterious material content shall not exceed the requirements set out in IS:383. Coarse aggregates and fine aggregates shall satisfy all the requirements specified in Sections 602.2.4.2 and 602.2.4.3 of MORTH (3rd Rev.)

Water:

Water used for mixing and curing of concrete shall be free from oil, salt, acid and other substances, which are harmful to concrete. It shall meet the requirements stipulated in IS: 456.

Mild steel bars for dowel and tie bars:

Dowel bars shall conform to S 240 (with yield strength 840 Mpa) and tie bars (deformed or plain) to grade Fe500 deformed steel bars as per IS: 1786/IS: 432

Pre-Molded joint filler:

This shall be used for expansion joints abutting structures like bridges, culverts and at end of the day work. These shall be of 20-25mm thickness or as shown in drawings, complying to IS 1838. It shall be 25mm less in depth than the thickness of slab provided in suitable lengths, which shall not be less than lane width. Holes shall be made to accommodate dowel bars.

Joint sealing compound:

While carrying out joint sealing, the provision made under codes viz. IRC: 57-2006, IRC: 15-2011 and IRC: 58-2011 shall be taken into consideration. This shall be hot poured Elastomeric type as per AASHTO M282 or cold poured Polysulphide type as per BS 5212-part2 having flexibility, resistance to age hardening and durability.

Separation membrane:

A separation membrane of impermeable plastic sheeting 125 microns thick shall lay between the concrete slab and sub-base by nailing with concrete nails to the lower layer. Where overlap is necessary the same shall be laid by at least 300mm.

2.0 Workmanship:**Mix: M250**

The mix shall be designed as per IRC: 44-2008. And the design shall be based on the flexural strength of concrete. The water content shall be minimum required to provide workability for full compaction of the concrete to the required density. The maximum free water cement ratio shall be 0.5. The mix shall be proportioned to give an average strength at 28 days exceeding the specified strength (4.8Mpa) by 1.65 times the standard deviation calculated from the flexural strength of the first 30 beams first during the trial length and then the job control test beams (during the actual execution). The workability requirements at the batching plant and at site shall be established by slump tests while doing trial length. A slump value of 30 ± 15 mm is reasonable for slip form paving and 50 ± 15 mm for fixed form paving. Avg. strength Ratio \otimes of 7 days and 28 days compressive strength of cubes prepared from each batch shall be determined periodically during construction. If R value so obtained is found less than those determined as the time of mix design, 5% extra cement shall be added to the mix.

Mixing:

The materials shall be mixed in a mechanized batching plant consisting air-conditioned centralized control cabin, minimum 4bins, weigh hoppers, separate scales for cement, fine and coarse aggregate

with weighing balances calibrated, aggregates being proportioned by automatic weighing devices using load cells. The concrete ingredients shall be mixed thoroughly by a mixer with automatic timing/alarm device to mix and discharge (in case of failure of timing/alarm device concrete shall be mixed as per Manufacturer's recommendations) capable of mixing to get a homogenous mix without being segregated while discharge.

Joints, dowel and tie bars:

The location and type of joint shall be as shown in the drawings.

Contraction Joints

Transverse joints shall be contraction and expansion joints, cut with mechanical saw, could start as early as 6-8 hours, i.e. initial hardening of concrete, after paving. The contraction joints shall consist of mechanical sawn joint groove, 3 to 5mm wide and 1/4 to 1/3 depth of the slab. The expansion joints shall consist of a joint filler board positioned vertically with the prefabricated assemblies along the line of joint. The dowel bars shall mild steel with details and dimensions as indicated in the drawings. Unless otherwise shown in the drawings the dowel bars shall be positioned at the mid depths of the slab with suitable tools/means within ± 20 mm tolerances. The dowel bars shall be covered with plastic sheath for at least 2/3rd from one end for contraction joint, and 1/2 length +50mm for expansion joint. For expansion joints, a closely fitting cap of 100mm long shall be provided at the sheath end. To block the entry of cement slurry between dowel and cap a compressible sponge may be used. The dowel bars shall be supported on cradles / chairs in pre-fabricated joint assemblies positioned prior to the construction of slab or mechanically inserted with vibration into the plastic concrete by a method which ensures correct placement of the bars besides full re-compaction of the concrete around the dowel bars.

Longitudinal Joints:

The longitudinal joints shall be saw cut as shown in the drawings. A groove of 1/3rd the depth of the slab may be cut after the final set of the concrete. The tie bars shall be deformed steel bars of 415 Mpa complying to IS 1786. Tie bars shall be painted with bituminous paint for 75mm at the both ends and positioned with suitable tools/means. Tie bars shall be placed within the middle third of the slab depth. Tie bars in the longitudinal joints shall be made up into rigid assemblies with adequate supports to remain firmly in position during the construction of slab.

Construction Joints:

Transverse construction joints shall be place whenever concreting is completed for the day's work on is suspended for more than 30 minutes. These shall be provided at regular location of contraction joints using dowel bars as stated above.

Using sealants, not before 14days after construction of slab shall seal all transverse and longitudinal joints, but prior to allowing the traffic ply on the new construction.

Separation membrane:

A separation membrane of impermeable plastic sheeting 125 microns thick shall lay between the concrete slab and the sub base by nailing with concrete nails to the lower layer. Wherever overlap is necessary, the same shall be laid by at least 300mm. Before placing the separation membrane the subbase shall be swept clean of all extraneous materials using high pressure water jetting or compressed air.

Construction by fixed form:

This shall consist of straight side forms made of steel of thickness not less than 5mm and of minimum 3000mm length. These shall have a depth equal to the prescribed thickness of the pavement. These forms shall be straight and free from bends and warps. Side forms shall be of sufficient rigidity in the form and in the interlocking connection with adjoining form such that springing will not occur under the weight of the sub grade and paving equipment or from pressure of concrete.

The vibrators for concreting shall be either surface pan type or internal type with immersed tube or multiple spuds. The surface vibrators shall a frequency not less than 3500 impulse per minute and the internal type vibrators shall have frequency more than 5000 impulse per minute.

Curing:

Curing shall be done manually by sprinkling water on PQC surface. Wet Jute bags shall be used to cover whole surface. Curing shall be start day after concreting and shall be done everyday up to 14th day. After the side forms are removed, edges of slabs shall be corrected wherever irregularities have occurred by using fine concrete consisting 1:3 ratio of cement to fine chips and aggregate.

After the final regulation of the slab and before the application of curing membrane, the surface of the

concrete shall be brush-textured at right angles to the longitudinal axis. The wire brush used for this purpose shall be made of 32 gauge type wired grouped together in tufts at 10mm centers and of width not less than 450mm.

Joints sealing:

When saw cuts joints are adopted in construction, they are not made to provide the minimum width specified in the drawings, they shall be widened subsequently by sawing before sealing, and the width and depth are controlled by gauges. When sealants are applied, an appropriate primer shall also be used, if recommended by the manufacturer and it shall be applied in accordance with their requirements. The sealant shall be applied within the minimum and maximum drying time of the primer recommended by the manufacturer. Before sealing, the temporary seal provided for blocking the ingress of dirt, soil, etc. should be removed. A highly compressible heat resistant paper-backed de-bonding strip as shown in drawing shall be inserted in the groove to serve the purpose of breaking the bond between sealant and the bottom of the groove and to plug the joint groove, so that the sealant may not leak through the cracks.

Machinery Requirement:

Batching plant, Transit Miller, Fixed form concrete paver machine with Vibrating screed roller, Water Tanker, Vibrator, Shovels, Broom, Wire brush, Straight edge.

Setting out will be done prior to work demarking the area of execution.

Measurement for Payment

The unit of measurement for M300 pavement cement concrete pavement shall be in cubic metre of concrete placed, based on the net plan area for the accepted thickness shown on the drawings or as directed by the Engineer.

The rate shall be for a unit of one cubic meter.

Item No :-115

Supplying of crushed stone aggregates, chippings etc. of hard stone of following nominal size free of disintegrated pieces deleterious and organic matter and grading as per I.R.C. Code.(iii) 25mm

Materials

Coarse aggregate shall be of machine crushed stone of black trap (B.T.Metal) or equivalent hard stone and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.

The aggregates shall generally be cubical in shape. Unless special stones of particular quarries are mentioned, aggregates shall be machine crushed, from the best, black trap or equivalent hard stones as approved.

If aggregate is covered with dust it shall be washed with water to make it clean.

Workmanship

As soon as the work of bed concrete of Percolation Well chamber has been completed the **stone aggregate (40mm. size)** layer 600mm. in thickness shall be laid. Care shall be taken to avoid any major voids being left in the layer while filling filter media, around PVC slotted pipe in the Percolation Well chamber. Above this layer **stone aggregate (25mm. size)** layer of 300mm. in thickness shall be laid.

Mode of Measurements & Payment

The payment shall be made for filling in filter media in the Percolation Well chamber. No deduction shall be made for shrinkage or voids, if filled as instructed above.

The rate shall be for a unit of one cubic meter of actual work done.

Item No :-116

Supplying of crushed stone aggregates, chippings etc. of hard stone of following nominal size free of disintegrated pieces deleterious and organic matter and grading as per I.R.C. Code.(ii) 40mm

Same as Item no. 115 but done for 40mm.

The rate shall be for a unit of one cubic meter of actual work done.

Item No :-117

Spreading the stone aggregate including filling the interstices to required camber and gradient (excluding spreading of Blindage)(iii) 25mm to 50mm size crushed stone

Same as Item no. 115 but done for 25mm to 50mm size crushed stone.

The rate shall be for a unit of one cubic meter of actual work done