

Specification of Platicizer.

Specification : Conforms to ASTM C – 494 TYPE A: IS 9103:1999

Usage : At Location with congested reinforcement, thin slender section or any other location, where improves workability is required.

For Pumped concrete as it improves the lubricating properties.

Roof slabs for both residential as well as industrial buildings.

Medium to low grade concrete to improve the cohesively.

Water retaining structure.

Method of application :

Add requires quality of plasticizer / water reducing agent either directly to the wet concrete mix in the concrete mixer under operation or along with gauging water.

Dosage : - 350 ml per 50 kg of cement, for best result conduct site trial.

Providing and Laying acrylic modified cementation composite coating system in two coats. 1st coat shall be acrylic polymer and cement and 2nd coat shall be of acrylic polymer, cement and silica sand. The application of both the coats shall be as per manufacturer's manual on terrace.

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Usage:

It is usage with cement to form polymer modified cementations composite (PMCC). In addition, if used with varying of silica / quartz sand produces PMC brush topping. PMC filler and PMC mortar. All the above material are extensively used for waterproofing and strengthening of external surface to prevent ingress of water.

Method of Application:

To Produce a PMC mix whether slurry, brush topping or mortar, requires quantity of Tape create P151 is to be mixed with proper amount of other material. The recommended ratio is 100 parts of OPC 50 parts Tape create P151. The PMC material is placed on the surface to be treated after wetting the surface to saturation but without any free water. The curing of PMC material is only nominal and required for maximum of 4 days starting one day after the application.

Dosage.

Covering capacity (Mix proportion) for tape create P151 coating / slurry: 100 Kg. Cement: 52 Kg Tape create Polymer.

Mode of Measurement:

The Rate includes labor charges for cleaning slab any other surface to applying coat. The rate shall be paid per 01 sqmt. for the work done.

Item No: 60

Synthetic Texture Plaster with Double Coat Smooth plaster : Providing 20mm thick cement plaster in single coat plastering upto floor two level Outside and finished even and smooth in (i) Cement mortar 1:3 (1-cement : 3-sand) as Base Coat and providing 2-3 mm thick synthetic texture plaster of approved texture (Material Shall be Used as Approved By GSPHCL Only) including cost of all materials, labour, conveyance, loading and unloading, taxes, royalties, scaffolding, watering etc. complete for any Height as per Drawing and instructions of Engineer -in-Charge.

Materials: Water shall be conform to M-1.

The cement mortar shall conform to M-11.

Workmanship

Scaffolding: For all plaster work H-frame or double scaffolding independent of the work having two sets of vertical supports shall be provided. The supports shall be sound and strong, tied together with horizontal pieces over which scaffolding planks shall be fixed. In no case scaffolding hole shall be allowed in brick masonry.

Preparation of Back-Ground:

The joints shall be raked out properly. Dust and loose mortar shall be brushed out. Efflorescence if any shall be removed by brushing and scrapping. The surface shall then be thoroughly washed with water, cleaned and kept wet before plastering is commenced. Smooth surface shall be toughened by wire brushing, if it is not hard and by hacking, if it is hard. In case of concrete surface, if a chemical retarder has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the retarders is left on the surface. Trimming of projections on brick/concrete surface where necessary shall be carried out to get an even surface. The raking of joints in case of masonry where necessary shall be allowed to dry out for sufficient period before carrying out plaster work. The work shall be not soaked but only damped evenly before applying the plaster. If the surface become dry, such area shall be moistened again. For external plaster, the plastering operation shall be started from top floor and carried down wards. For internal plaster, the plastering operations may be started wherever the building frame and cladding work are ready and the temporary supports of the ceiling resting on the walls of the floor have been removed. Ceiling plaster shall be completed before starting plaster to walls.

Application plaster:

The plaster about 50 x 50 mm shall be first applied horizontally and vertically at not more than 2 meters intervals over the entire surface to serve as gauge. The surface of these gauge shall be truly in plane of the finished plaster surface. The mortar shall then be applied in uniform surface slightly more than the specified thickness, then brought to a true surface by working a wooden straight edge reaching across the gauges with small upward and sideways movements at a time. Finally the surface shall be finished off true with a trowel or wooden float according as a smooth texture is required. Excessive trowelling or overworking the float shall be avoided. All corners, arrises,

angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering, corners, arriser junctions etc. shall be carried out with proper templates to the size required. Cement mortar shall be used within half an hour after addition of water and mortar or plaster which is partially set shall be rejected and removed forthwith from the site. In suspending the work at the end of the day, the plaster shall be left out clean to the line both horizontally and vertically. When recommencing the plaster, the edges of the old work shall be scraped clean and wetted with cement putty before plaster is applied to the adjacent areas to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of the wall and nearer than 15 cm to any corners or arises. It shall not be closed on the body of features such as plaster bands and cornices nor at the corners or arises. Horizontal joints in plaster work shall not also occur on parapet top and copings as these invariably lead to leakage. No portion of the surface shall be left out initially to be packed up to later on. Each coat shall be kept damp continuously till the next coat is applied or for a minimum period of 7 days. Moistening shall commence as soon as plaster is hardened sufficiently. Soaking of walls shall be avoided and only as much water as can be readily absorbed shall be used, excessive evaporation on the sunny or windward side of building in hot air or dry weather shall be prevented by hanging matting or gunny bags on the outside of the plaster and keeping them wet. Any cracks which appear in the surface and all portion which sound hollow when tapped or found to be soft otherwise defective, shall be cut out in rectangular shape and redone as directed by engineer in charge. No extra payment shall be made for this redone the plaster work. To prevent surface cracks appearing between junctions of column/beam and walls, 180 mm wide chicken wire mesh or fiber mesh (145 GSM) should be fixed with U nails 150 mm centre to 125 centre before plastering the junction. The plastering of walls and beam/column in one vertical plane should be carried out in one go. For providing and fixing chicken wire mesh or fiber mesh (145 GSM) with U nails payment shall be made separately.

PRODUCT DESCRIPTION

Synthetic Fiber Plaster is trowel applied finish incorporating natural stone chips (1-2.5mm), silica sand quartz (60mesh-150mesh) etc. bonded in a synthetic emulsion medium of pure acrylic with silicone and high performance special additives. S.F.P is available in twin pack system, pack-A contains dry material to be mixed with Pack-B which is a special binding medium made up of pure acrylic.

Synthetic Fiber Plaster is reinforced with fine filaments made up of synthetic organic polymers which forms a web like structure inside the film resulting a peel crack resistant film even under acute dampened conditions. Fiber reinforcement gives better anchoring and strength.

To be used on exterior surface. Can be used on interior surfaces of cement plaster, gypsum board and woodwork. It is easy to apply and provides grooved pattern in varied directions, like vertical/horizontal/jumble up.

SURFACE PREPARATION

1. Surface Preparation is the responsibility of the Contractor and the

2. Applicator. To achieve the indicated performance. It must be carried out according to companies' recommendations.
3. The surface must be free of dirt, dust, grease, oil, mouldreleas agents, bond breakers and any other contaminants that may interfere with adhesion.
4. Fresh cementitious substrates should be left for 14 day before coating.
5. There must be less than 15% moisture Wood Equivalent in the surface at the time of coating to ensure optimum coating performance.
6. Surface preparation Surface should be sound and free from loose and flaking material. All cracks to be filled up with Approved polymerized cement surface filler "patch coat" followed by one coat of polyunder primer (pure acrylic based sealer primer) to ensure a sound non-absorbent surface.

APPLICATION

It is recommended that application be carried out by a skilled applicator, and should be totally conversant with the products and systems to validate full material warranty conditions.

The temperature of the substrate should be 10°C minimum and 40°C maximum. No seepage the surface, and weather must be dry during application

Application Methods:-Stainless Steel Trowel and Fiber Trowel

Application Data:-

Mixing Ratio (volume) Thinner/Cleaner

WateronTwin Pack (Dry S.F.P. & Liquid Bonding Agent)

Drying Time:-Drying times are generally related to air circulation, temperature, film thickness and number of coats, and will be affected correspondingly.

Good Ventilation (Free circulation of air)

Typical film thickness

One coat on top of inert substrate Relative humidity 70%

1. The surface should be dry and free from any contamination prior to application of the Subsequent coat.

PRECAUTIONS

1. These Texture finishes will give maximum water proofing to the structure because of its coating system.
2. This is used to upgrade the appearance of a wide range of cementitious substrates, providing economical and aesthetically pleasing long life protection. The rigor finish has a proven track record having been in use for decades with many thousands of successful projects.
3. The high-build film allows some surface imperfection to be filled, minimizing the degree of surface preparation require.
4. These finishes are water-based for applicator safety and ease of use.
5. To achieve indicated performance, surface preparation must be carried out according to the company recommendations.

6. The surface must be free from dust, dirt, grease, oil and other contaminants that may interfere with adhesion.
7. Fresh cementitious substrates should be left for 14 days before coating.
8. These finishes are available only in single colour systems.

Storage

The product must be stored in accordance with national regulations. The product must be kept in a cool and well-ventilated place, protected from heat and direct sunlight. Containers must be kept tightly closed.

Handling Handle with care.

Scaffolding:

For all Synthetic Fiber Plaster work H-frame or double scaffolding independent of the work having two sets of vertical supports shall be provided. The supports shall be sound and strong, tied together with horizontal pieces over which scaffolding planks shall be fixed. In no case scaffolding hole shall be allowed in brick masonry.

RECOMMENDED SYSYEM FOR APPLICATION

STEP 1		STEP 2	
Texture Coat	Dry min.24 hrs.	Texture Coat Dry 4-6 hrs.	
(1 coat)		(2-3 coats)	in
between coats			

Mode of measurement & payments:

The rate shall include the cost of all materials, labour and scaffolding etc. involved in the operations described under workmanship as well as Plaster work includes all grooves, pattas, pattis, Tapak (Plaster Drip) as may be directed by the engineer in charge and GSPHCL Ltd. All the plastering shall be measured in square meter unless otherwise specified. Length, breadth or height shall be measured correct to a centimeter. Thickness of the plaster shall be exclusive of the thickness of key i.e. grooves or open joints in brick work, stone etc. or space between laths. Thickness of plaster shall be average thickness with minimum 10 mm at any point on this surface. This item includes plastering up to floor two level. The measurement of wall plastering shall be taken between the walls or partition (dimensions before plastering being taken) for length and from the top of floor or skirting to ceiling for height. Depth of cover of cornices if any shall be deducted. Soffits of stairs shall be measured as plastering on ceilings. Flewing soffits shall be measured separately. For jambs, soffits, sills etc. for openings not exceeding 0.5 sq.mt. each in area for ends of joints, beams, posts, girders, steps etc. not exceeding 0.5 sq. mt. each in area and for openings exceeding 0.5 sq. mt. and not exceeding 3.00 sq.mt. in each area deductions and additions shall be made in the followings manner:

(a) No deduction shall be made for ends of joints, beams, posts etc. and openings not exceeding 0.5 sq.mt. each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings. For finishing to plaster around ends of joints beams and posts etc.

(b) Deduction for openings exceeding 0.5 sq. mt. But not exceeding 3 sq. mt. each shall be made as follows and no deduction shall be made for reveals, jambs, soffits, sills etc. of these openings.

(c) When both faces of the all wall are plastered with same plaster, deduction shall be made for one side only.

(d) When two faces of wall are plastered with different types of plasters or if one face is plastered and the other pointed deductions shall be made from the plaster or pointing on the side of frame for door, window etc. on which width of reveals is less than that on the other side but no deductions shall be made on the other side. Where width of reveals on both faces of all are equal, deductions of 50% of area of opening on each face shall be made from areas of plaster and/or pointing as the case may be. (e) For openings having door frames equal to or projecting beyond the thickness of wall, full deduction for opening shall be made each plastered face of the wall. (f) In case of openings of area above 3sq.mt. each deduction shall be made for openings but jambs, soffits and sills shall be measured.

The rate shall be for unit of one Sq. Mt.

Item No. : 69

Steel work, welded in built up sections framed work fabrication & erection including cutting, hoisting, fixing in position and applying a priming coat of paint. in beams and joints, channels angles Tees, flats, with connecting plates or angle cleats as in main and cross beams. Hip and jack rafters, purling connected to common rafters and the like. Rate is inclusive of welding with grinding and applying of mild steel putty into groove to have smooth surface, two coats of oil paint and one coat of yellow zinc chromate primer coat of approved brand only. Oil paint shall be Luxol Enamel paint of Berger paint India limited or Asian paint Apcolite premium gloss Enamel of Asian paint or Dulux premium gloss Enamel of Dulux paint and Nerolac Synthetic Enamel of Nerolac Paint for all floor and at any height only.

Material:

All Structural Steel should be as per to IS: 226-1975. The Steel shall be free from the defects mentioned in IS: 226-1975 and shall have a smooth finish. The material shall be from loose mill scale, rust pits or other defects affecting the strength and durability. Round bars shall conform to IS: 1148-1973.

When the steel is supplied by the contractor test certificate of the manufactures shall be obtained according to IS: 226-1975 and other relevant Indian standard.

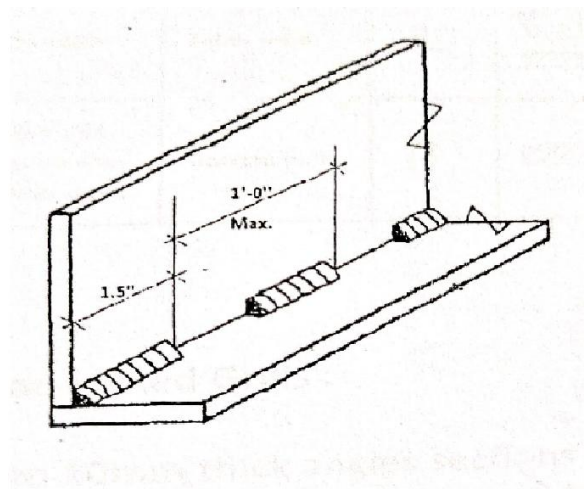
Workmanship:

The Steel work, welded in built up sections framed work shall be prepared as per the drawings and installed as directed. The Steel work, welded in built up sections. shall be fabricated to the consigns and patterns shown in the drawings and the weight shall be directed and the joints shall be welded as shown in the plan of as directed. In beams and joints, channels angles Tees, flats, with connecting plates or angle cleats as in main and cross beams. Hip and jack rafters, purling connected to common rafters and the like.

The joints shall be welds in following manners/ as shown in the drawing of as per IS 816-1969 & SP: 6 (7) - 1972

Welded in built up sections framed work:

- As up to 10mm thick MS Flats are used to build angle section, fillet weld of leg-length 3mm is required and so Size of weld required is 5.4mm; for economy can provide tack weld as fillet weld with single tack length of minimum 1.5 inch at maximum 1'-0" feet centre to centre staggered or both face of joint as shown in figure below



IS : 816 - 1969

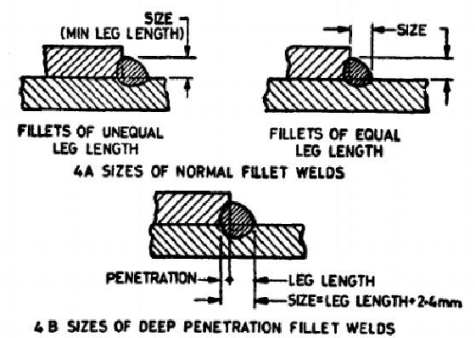


FIG. 4 SIZES OF FILLET WELDS

- MS Gate's built-up frames with angle sections are covered with 2mm thick plates, through weld to plate with frame internally is not possible as plate is too thin. Fillet weld of leg-length 3mm shall be provided with size of weld as 5.00mm internally; for economy can provide tack weld as fillet weld with single tack length of minimum 1.5 inch at maximum 1'-0" feet centre to centre as shown in figure above.
- For 2mm plate's weld of external faces on built-up frames with angle section, through weld to plates with frame externally is not possible, square edges of plates will get damaged due to overheating, here tack weld is suggested without grinding as grinding will reduce size of weld and capacity of joint will be affected.
- According to availability of size of plate, a horizontal joint is provided in 2mm thick plates at nearly sill level to all the gates, here to have smooth surface for esthetic grinding is done externally. It is suggested to provide square butt weld joint on one side of plates with spacing of 2mm between plates and locating joint on MS angle section as backing; here 3.0mm weld size is required and grinding can be done after welding to have smooth surface for esthetic before applying paints. As shown in below Table.


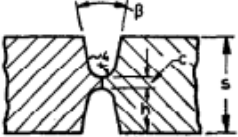

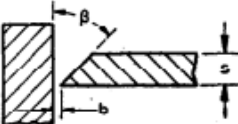
TABLE 10 DETAILS OF JOINTS FOR MANUAL METAL ARC WELDING OF STEEL

(Clause 4.3.1)

PLATE THICKNESS s mm	EXECUTION OF WELD	TYPE OF WELD	SYMBOL	SECTIONAL REPRESENTATION OF WELD PREPARATION	α DEGREE	b^* mm	e mm	h mm
Up to 2	One side	Stitch weld	JL		—	—	—	—
Up to 3	One side	Square butt	Π		—	≈ 3	—	—
Up to 6	Both sides	Square butt	Π		—	$\frac{s}{2}$	—	—

MS Gates and Fixed Grills:

- Up to 10mm thick angles sections are used to build box sections, it is better to use readily available square hollow sections rather than built-up box sections on site with angles; with use of box sections, can optimize thickness as per requirement and will result into economy.
- For fixed grills and entry gates to barracks, angles sections are used to build box sections, here single bevel butt through weld of leg-length 3.5mm is required and so Size of weld required is 6.0mm as shown in table below. Required grinding can be done for esthetics before applying paints and after applying mild steel putty to have smooth surface.

TABLE 10 DETAILS OF JOINTS FOR MANUAL METAL ARC WELDING OF STEEL — <i>Contd</i>								
PLATE THICKNESS s mm	EXECUTION OF WELD	TYPE OF WELD	SYMBOL	SECTIONAL REPRESENTATION OF WELD PREPARATION	α DEGREE	b^* mm	e mm	h mm
Over 30	Both sides	Double-U butt			~ 10	0-3	~ 3	$s/2$
3 to 16	One side	Single bevel butt			45-60	0-3	—	—
6 to 16	Both sides							

- Here if, esthetics is not an issue for economy can provide tack weld as single bevel butt weld with single tack length of minimum 1.5 inch at maximum 1'-0" feet center to center staggered at both flange joints. After welding and before applying paints, application of mild steel putty in to flange grooves can be done to have smooth surface.
- 20mm dia. Mild steel rods are fixed in to box frames to form grills for doors and ventilators. Intermediate welding to rods with frame is not necessary for strength purpose, shall be done at ends only.

Welding with grinding and applying of mild steel putty into groove to have smooth surface, two coats of oil paint and one coat of yellow zinc primer coat of approved brand only. Oil paint shall be Luxol Enamel paint of Berger paint India limited or Asian paint Apcolite premium gloss Enamel of Asian paint or Dulux premium gloss Enamel of Dulux paint only.

Mode of Measurement and Payments :

- No payment shall be made for weight of screws, bolts, nuts etc. Only weight of built-up section shall be paid. coat
- Rates inclusive of applying one coat of yellow zinc primer and two oil paint of oil paint of approved brand.
- The rate shall be for a unit to be One Kg. actual measured at Site.

Item No. 88

Providing and fixing standard extruded of aluminium section of size 63mm x 38.10mm x 1.01mm (Jindal section :20033, @ Wt.0.593kg/Mt) with colour anodized aluminium frame for ventilation with 5 mm thick frosted glass as details etc complete for ventilation.

Materials

Aluminium section for the all around frame is to be used of jindal make 20033 of size 63 x 3810 x 1.01(0.593 Kg/Mt)

Additional vertical members are to be of heavy aluminium anodized with in built system of making louvers up & down with the proper holding knob from movement.

5mm thick glass shall be clear or Dudhiya or Acid wash or colour as instructed by Engineer In-Charge.

Materials shall be of approved quality and shall generally conform to latest IS specifications and size of the sections are as specified in the item description. All units shall conform to AA – Aluminum Standards and data, latest edition. The contractor shall order all the materials required for the execution of work as early as necessary and ensure that such materials are on site well ahead of requirement for use in the work. The work involved calls for high standard of workmanship combined with speed and to the entire satisfaction of the Consultant.

Workmanship

The contractor shall furnish all labour, materials, equipments & appliances required for the complete execution of the work as shown on drawings and as specified herein. The contractor shall make his own arrangement for necessary scaffolding/staging, etc. for erection.

Contractor shall submit Samples prior to work. Samples shall include colour & finish samples for each finish type required.

The aluminum sections shall confirm to the following parameters also

- a) The minimum tensile strength shall be 19kgf/m.
- b) The maximum allowable deviation in length from a straight line shall be 0.5mm/metre.
- c) The maximum allowable deviation from straight line shall be one degree.
- d) The maximum permissible twist shall be 0.5 mm/meter.

The contractor shall execute the works as per working drawings provided of louver units and accessories including plans, elevations, sections & Details showing profiles, angles, spacing of louvers, unit dimensions related to openings & constructions, free areas for each size indicated.

All aluminum section shall be anodized with matt finish colour & shade anodizing shall be 6 microns thick prior to anodizing to all aluminum members shall be rendered uniform in appearance free from scratches, stains or other blemishes.

Mode of measurement and payment

Measurement shall be taken in length and width of completed dimension. The rate includes for execution of whole item and shall be paid for a unit of one sq. meter as per actual work done.

Item No : 117

Providing and Fixing SS cloth hanger (5 hook) as per detail drawing and as directed by Engineer in charge. Rate are inclusive of all material, labour and taxes etc complete Samrat Brand Only Materials:

It should be 100% Teak stainless steel of samrat brand only.

Workmanship:

A contractor has to check and verify the quality of product in terms of size of the product and finishing.

Cloth hanger to be fix on wall or door as directed by Engineer in charge with screws and plug.

Colour of the cloth hanger shall be uniform.

Mode of measurement and payment:

The rate including cost of all materials, tools, plants and labour involved in satisfactory completion of work including cost of plug and screw etc. The rate shall be for unit of one numbers. The work shall be carried out as per detailed architectural drawings and as directed by E.I.C.

Item No. 118

Providing Supplying and Fixing Single Pipe Bracket System with U Bolt Rubber mounted for Pipe Supporting Clamping System for External Vertical Fixed line with wall distance 3" including nuts, bolts, fasteners etc complete as per detailed Specifications and as directed by Engineer in Charge. (Rain Water Bracket for pipe sizes 75 mm, 90 mm & 110 mm / Mono Bracket for pipe sizes 40 mm & 50 mm)

Pipe Supporting Clamps having Bracket / Clamp of Hot Roll gauge corrected Oil Pickled & Drawn (HROP D) steel material (IS 1079); approx. 3mm thick with Hot Dip Galvanised (IS 2629) + Zinc Aluminium (Zn Al) Flake coated having Salt Spray Test (Test method - ASTM B-117) result - 2000 hrs and U Bolt Zn Al Flake coated having Salt Spray Test (Test method - ASTM B-117) result - 1000 hrs of approx. 7 mm dia. with Zn Al Flake coated Flange (In Built Washer) Nuts (BSW 5/16 x 18 x 8 x 13 with Serration set as per DIN 6923) and Transparent Silicon Rubber [Grade : HS 5272G (Fume Silica)] Sleeve mounted for Vertical Drainage / Rainwater / Water Supply pipes in per unit costing etc. complete for Single Pipe System; Wall Distance 3".

Material:

1.Single Pipe Bracket (Rain Water Bracket (Design Patent No. 373099 – 002) **for pipe sizes 75 mm, 90 mm and 110 mm / Mono Bracket**(Design Patent No. 386382 – 001) **for pipe sizes 40 mm and 50 mm)** having Wall Distance 75 mm (3") made of Low Carbon Hot Roll Gauge Corrected Oil Pickled & Drawn (HROP D) Steel (IS 1079); material size for **a.** Rain Water Bracket with pipe support channel is 32 mm width x 3 mm thickness with ribs and notch and **b.** Mono Bracket is made of strip size 48 mm width x 3 mm thickness with ribs and notch;are Hot Dip Galvanized + Zn Al Flake coated having Salt Spray Test (Test method - ASTM B-117-2019) result 2000 hrs.

2.U bolt Rubber Mounted are made of low carbon mild steel with Rod diameter 7 mm approx.; Zn Al Flake coated having Salt Spray Test (Test method - ASTM B-117-2019) result 1000 hrs with noise absorbing transparent ribbed silicon rubber sleeve; with Hex Flange Nut BSW 5/16 x 18 x 8 x 13 with Serration set as per DIN 6923 - Zn Al Flake coated.

Hot dip Galvanizing: As per IS 2629 (1985) - 610 grams/m² (> 85 microns).

Material Grade: IS 1079 used as per MTC confirms to EN 10204 3.1.

Workmanship:

Providing support to drainage and water supply pipes with Plumbing Pipe support clamping system at a specified distance from the wall for vertical lines fixed at intervals of every 1.5 meter.

1. Prepare a sample plumbing clamping system where the pipes would be running at site area with the types of U bolts of specific pipe od (outer diameter) size to be used with Single Pipe Bracket (Rain Water Bracket for pipe sizes 75 mm, 90 mm & 110 mm / Mono Bracket for 40 mm & 50 mm) + U bolt rubber mounted system

2. Single Pipe Bracket System will be provided & used with respect to the pipe size at per requirement at the site area.

3. Single Pipe bracket shall be fixed at every one and half meter distance on external wall and it's fixing shall be such that the vertical alignment of pipes is maintained.
4. The Single Pipe brackets shall be fixed using frame anchor (10 x 80) or GI coated nails 6.5 mm thick & 63 mm inch long on brick / solid block wall and Stud / Bullet anchor fastener (M8 or M10 size) on RCC member.
5. The U bolt rubber mounted to be used for pipe supporting plumbing solutions shall be confirmed with Outer dia. (OD) of pipes and used to fix the pipe on the Single Pipe Bracket so as it maintains proper vertical alignment.

Mode of measurement and payment

- The rate includes cost of all materials and contractor profit.
- The rate shall be for a unit of one item each.

Item No 119

Providing Supplying and Fixing S4 Channel System (S4 Channel + Profile Bracket + U Bolt Rubber mounted System) for multiple Pipes for External Vertical Fixed line with wall distance 3" including nuts, bolts, fasteners etc complete as per detailed Specifications and as directed by Engineer in Charge.

Supplying & Fixing Pipe Supporting Clamps having Bracket / Clamp made of Hot Roll gauge corrected Oil Pickled & Drawn (HROP D) steel material (IS 1079); approx. 3mm thick with Hot Dip Galvanised (IS 2629) + Zinc Aluminium (Zn Al) Flake coated having Salt Spray Test (Test method - ASTM B-117) result - 2000 hrs and U Bolt Zn Al Flake coated having Salt Spray Test (Test method - ASTM B-117) result - 1000 hrs of approx. 7 mm dia. with Zn Al Flake coated Flange (In Built Washer) Nuts (BSW 5/16 x 18 x 8 x 13 with Serration set as per DIN 6923) and Transparent Silicon Rubber [Grade : HS 5272G (Fume Silica)] Sleeve mounted for Vertical Drainage / Rainwater / Water Supply pipes in per unit costing etc. complete for S4 Channel + Profile Bracket + U Bolt Rubber mounted System ; Wall Distance 3".

Material:

1.Profile Bracket(Design Patent No. 373099 – 001) having Wall Distance 75 mm (3") made of Low Carbon Hot Roll Gauge Corrected Oil Pickled & Drawn (HROP D) Steel (IS 1079); material size 32 mm width x 3 mm thickness with ribs and notch are Hot Dip Galvanized + Zn Al Flake coated having Salt Spray Test (Test method - ASTM B-117-2019) result 2000 hrs with SS304 Hex Flange Bolt with Serration 5/16 x 3/4 (A/F 13mm) as per DIN 6921 and SS304 Hex Flange Nut BSW 5/16 x 18 x 8 x 13 with Serration as per DIN 6923.

2.S4 Channel (Continuous Slotted "C" Channel)(Design Patent No. 373100 – 001) with ribs to be used of size 250 mm (10") made of Low Carbon Hot Roll Gauge Corrected Oil Pickled & Drawn (HROP D) steel (IS 1079); material size 48 mm width x 3 mm thickness with ribs are Hot Dip Galvanized+ Zn Al Flake coated with material thickness of 3mm.

3.U bolt Rubber Mounted are made of low carbon mild steel with Rod diameter 7 mm approx.; Zn Al Flake coated having Salt Spray Test (Test method - ASTM B-117-2019) result 1000 hrs with noise absorbing transparent ribbed silicon rubber sleeve; with Hex Flange Nut BSW 5/16 x 18 x 8 x 13 with Serration set as per DIN 6923 - Zn Al Flake coated.

Hot dip Galvanizing: As per IS 2629 (1985) - 610 grams/m² (> 85 microns).

Material Grade: IS 1079 used as per MTC confirms to EN 10204 3.1.

Workmanship:

Providing support to drainage and water supply pipes with Plumbing Pipe support clamping system at a specified distance from the wall for vertical lines fixed at intervals of every 1.5 meter.

1. Prepare a sample plumbing clamping system where the pipes would be running at site area with the types of U bolts of specific pipe od (outer

diameter) size to be used with S4 channel + Profile Bracket + U bolt rubber mounted system

2. For S4 Channel (Continuous slotted c channel) length above 2.5 feet, an additional profile bracket support needs to be provided for every 1.5 feet increase in channel length.

3. S4 Channel (Continuous slotted c channel) will be provided with pre-cut size and treated as per project requirement.

4. Profile bracket shall be fixed on the horizontal RCC member wherever (floor slab / sunk slab / horizontal beam) available in the duct with stud / bullet anchor fasteners. In between subsequent floor slabs the pipes shall be supported by Profile bracket system at every one and half meter distance on external wall. The type of Profile bracket and it's fixing used shall be such that the vertical alignment of pipes is maintained.

5. The Profile brackets shall be fixed at both ends with its legs facing inside using frame anchor (10 x 80) or GI coated nails 6.5 mm thick & 63 mm inch long on brick / solid block wall and Stud / Bullet anchor fastener (M8 or M10 size) on RCC member.

6. The U bolt rubber mounted to be used for pipe supporting plumbing solutions shall be confirmed with Outer dia. (OD) of pipes and used to fix the pipe on the S4 Channel so as it maintains proper vertical alignment.

Mode of measurement and payment

- The rate includes cost of all materials and contractor profit.
- The rate shall be for a unit of one item each.

Item No. : 120

Providing 3nos Groove in Total Length of Stair Case Tread of size 10mmX10mm finished smooth in parallel line equally spaced as per direction of Engineer-In-Charge in all type of Flooring etc. Complete.

1.0 General:

3 nos. groove in total length of staircase tread of size 10mm*10mm finished smooth in parallel line, equally spaced in all type of flooring/stone work, treads of steps as per detailed architecture drawing supplied by GSPHC and as per direction of engineer in-charge.

2.0 Mode of measurements and payment:

The rate shall be paid for a unit of running meter.

Item No : 124

Providing and Fixing Teak wood door frame patti 40mm x 10mm thick as per detail drawing and as directed by engineer in charge. Rates are inclusive of all material, labour and taxes etc. complete

Materials:

It should be 100% Teak wood patti of size 40mm x 10mm of superior finish product.

Workmanship:

A contractor has to check and verify the quality of product in terms of size of the product and finishing.

Teak wood door patti to be fix between door frame and wall with superior finish.

Colour of the teakwood patti should be exactly match with the colour of frame and door.

Mode of measurement and payment:

The rate including cost of all materials, tools, plants and labour involved in satisfactory completion of work including cost of primers & painting etc. The rate shall be for unit of one running meter of teak wood patti as visible. The work shall be carried out as per detailed architectural drawings and as directed by E.I.C.

Item No : 125

Providing and Fixing wpc door frame patti 26mm x 8mm thick as per detail drawing and as directed by engineer in charge. Rates are inclusive of all material, labour and taxes etc. complete

Materials:

It should be 100% wpcpatti of size 26mm x 8mm of superior finish product.

Workmanship:

A contractor has to check and verify the quality of product in terms of size of the product and finishing.

wpcpatti to be fix between door frame and wall with superior finish.

Colour of the wpcpatti should be exactly match with the colour of frame and door.

Mode of measurement and payment:

The rate including cost of all materials, tools, plants and labour involved in satisfactory completion of work including cost of primers & painting etc. The rate shall be for unit of one running meter of teak wood patti as visible. The work shall be carried out as per detailed architectural drawings and as directed by E.I.C

Item No.: 128

Providing & Fixing 3 mm thick acrylic sheet with Vinyl letter color-2073 dark grey for - 2199-white letter with required screws.... Etc. as per required sizes complete etc. as per specification & instruction of Engineer in charge.

3mm thick acrylic sheet with Vinyl letter colour for back ground and letter colour as suggested by Engineer In Charge or as per architectural drawing with required screws to fix...etc. as per required sizes complete etc. as per specification, drawings & instruction as per Engineer In Charge. acrylic sheet is photo luminescent auto glow type of approved quality including fixing on door, wall, ceiling complete with installation as directed.

Mode of Measurement & Payment

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

Item No. 129

P & F stainless steel Letters 32.50cm Height and 4.5cm wide with spraying colour on surface etc. complete.

304 grade with spraying colour on surface etc. complete as directed. Size of the S.S. letters etc...

Letter of required size shall be prepared out of stainless steel metal

Font pattern shall be as directed by Engineer – In – Charge.

Letter Size as per specify in Description etters shall be prepared in English and or Gujarati as required by Engineer – In – Charge.

Letters shall be fixed on ACP panel of size as per SS Letter required building with required screws and at any height as shown by the Engineer – In – Charge.

Payment shall be made per No of each letters.

Rates are inclusive of all materials labour for fixing & Finishing etc complete.

In Gujarati Rates are inclusive of Punctuation marks.

Item No. 142

Providing & Fixing Precast R.C.C Frame with cover MD 10 Ton (Rubber Mould Finish) inner size 600 x 450mm with all necessary fittings.

Materials

Precast RCC cover size of 0.60 x 0.45 m. with Frame. Frame size 0.60m x 0.80m (out to out), and Mixing proportion M200 (1: Cement; 1.5: Coarse Sand and 3: 20mm Nominal size Agregate of best quality.

Workmanship

Precast RCC frame fixing on IC with Cement mortar 1:4, If necessary outer side plaster finish with plaster in 1:4 finish smooth. cover shall be fixed on Precast RCC frame.

Mode of measurements & payment

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

The rate shall be for a unit of one number.

Item No. 144

Drilling of 215mm. dia. bore hole in overburden strata by DTH rig upto required depth including fixing of 200 mm dia. PVC pipe further drilling of 165mm dia bore hole in soft/hard rock by DTH drilling method upto total depth 150 Mtr. (0 to 150 Mtr.)

Drilling of 215mm dia bore hole for 175mm dia PVC pipe upto required depth in over burden strata (maximum upto 30 meters) and further drilling of 165mm dia. bore hole in remaining rocky and sand stone strata upto 0 to 500 mtr depth or as per the recommendation of Geologist. The drilling shall be done by the hole type drilling Rig. payment for supplying 175mm dia. PVC pipes and bore plug will be done separately. The carting of pipes and other materials etc. should be carried out by contractor from market to site of work at his own cost.

Drilling work shall be carried out at the sites by the Department. The diameter of the hole should be 215mm dia. in over burden strata and 165mm dia in rocky and sand stone strata upto over all specified depth of 0 to 500 mtr. The drilling shall be carried out in over burden strata upto maximum 30 meters as per the actual site requirement or the recommendation of Geologist. If further drilling cannot be done due to over burden upto 30 meter or in rocky or sand stone strata due to mechanical failure upto specified depth the drilling shall have to be stopped in consultation with Engineer-In-charge and no payment shall be made for the drilling carried out by the contractor.

The 175mm dia PVC pipes should be lowered by the contractor in overburden strata. The jointing of pipes will be carried out by the contractor as desired by the Engineer-In-Charge. Necessary jointing materials, PVC coupler & jointing materials of solvent etc. should be provided by the contractor at the own cost.

DRILLING OPERATION :

The drilling operation for construction of tube well should be carried out by suitable rig to satisfy following.

[A] For Drilling through over burden :

[1] The diameter of the bore in the over burden shall be sufficient for insertion of 175mm dia PVC pipe casing pipes with the joints and leaving sufficient annular space for grouting the casing pipe with sticky clay or local soil etc. Annular space between bore hole and casing pipes should be filled up with sticky clay or local materials etc. by the contractor with out any extra cost, i.e. at his own cost.

[2] The boring in the over burden should be contained through the rock / sand stone at least up to 0.15 Mtrs. So, that casing pipes can be properly embedded in the rocky / sand stone formation.

[3] After the casing pipes embedded in the rock / sand stone, the same is to be grouted with materials like sticky clay or local materials etc. So, as to avoid leaking of drain water in the bore.

[4] Drilling of 215mm dia. in over burden strata, upto 30 Mtrs. are compulsory, if required.

[B] FOR DRILLING THROUGH ROCK :

Boring through rocks shall be of 165mm dia. and the total depth from the ground level of the bore shall upto 0 to 500Mtr. or as per the recommendation of the hydrologist / Jr. Geologist./ Engineer-In-Charge of GSPHC Limited.

Lowering of Casing Pipes :

[1] Casing pipes shall be properly socketed, jointed & screwed, so as to ensure a continuous length lowered through the over burden, so as to reach at least 0.15 Mtr. inside the hard rock. The length of casing pipes should be kept such that at least 0.30 Mtr. remains projected above the ground level. After completion of the work at site, the top of the casing pipes shall have to be closed either by a screwed or by PVC cap plug unless power is fitted immediately after completion of the bore.

[2] The casing pipe shall be lowered in such a manner so that it remains vertical so as to ensure installation of power pump.

[3] All the tools and plants and other suitable machinery required for work for al drilling, developing, etc. for the tube well shall be provided by the contractor at his own cost at the site of work.

[4] In case of any item not covered by the specification stated herein such work shall be carried out by the contractor strictly, according to the written instructions of In Charge Engineer, which will be binding to the contractor and shall have to carry out such work at departmental schedule. The rates shall be mutually agreed upon. However, the decision of the Executive Engineer will be final.

[5] During the drilling operation if the water bearing strata found at a depth lesser than estimated depth the Executive Engineer or his representative shall have authority to instruct the contractor to stop the work, for reduction in the quantity of the work, the contractor shall not be eligible for any compensation.

[6] If the bore is required to be drilled above the specified depth, the contractor shall be bound to carry out such additional work, including drilling providing and lowering of casing pipes as may be necessary. The relevant specifications regarding drilling providing and lowering pipes, taking yield test and strata sample etc. Shall also apply in case of such additional work. The rates for additional work will be paid as per the rate fixed.

[7] Lowering and fixing of housing and casing shall be carried out in workman like manner. The contractor shall be responsible for workman compensation in case of any accident. In case of dispute or over items the decision of the Executive Engineer shall be final and binding to contractor.

[8] No further drilling if tube wells allowed, if more than two bores will remains untested at a time. This clause will be applicable without any prejudice (i.e. compensation for delay)

[9] The contractor shall clear the site before starting of the work and after completion of the work and shall hand over the bore with final finishing of the work. As directed by the Executive Engineer-In-Charge which shall have to be done by the contractor at his own cost.

[10] The approach roads to site of work, may be kachha roads and contractor shall have to make his own arrangement for repairing of the road

and maintaining the same for transporting his materials and equipment at his cost which shall be utilized by the department for inspection etc. purpose.

[11] The contractor will have to make arrangement at his own for cleaning of bore hole, if filled – up by clay, sand, dust & boulders etc.

[12] If bore is not completed upto designed / recommended depth due to mechanical failure or any other reason on payment shall be made for such abandoned bore.

[13] The contractor will have to make arrangement at his own cost for :

- A.** Rig Vehicle, Machineries etc.
- B.** Facilities for moving bulky materials.
- C.** Releasing the transporting materials.
- D.** Keeping in custody department materials until finally taken over by the Office-In-Charge of the work.
- E.** Repairing to the damage caused in the process of the executing the works.
- F.** Approach road to the site.
- G.** The rate shall be paid per running meter of work done.

Item No. 145

Supplying & jointing 200mm dia size slotted PVC 10Kg./ Sq.cm pipe of approved quality at site including jointing materials etc. completed by Engineer In Charge.

Slotted PVC casing pie shall be of required specified dia with 10Kg./ Sq.cm working pressure shall be confirm to relevant I.S. The specials and fitting required shall be of best quality. The pipe shall be in random length of 6.0m to 7.0m.

For jointing of pipes the pipes and socket shall be accurately cut. The ends of pipes and fitting shall be absolutely free from dirt and dust. The out side surface of the pipe and inside of the fitting shall than be roughed with Emery paper and then solvent cement joint. Since solvent cement is aggressive to PVC care must be taken to avoid applying excessive cement to the inside to pipe sockets as any surplus cement cannot be wiped off after jointing. It any manufacturer recommended its own methods of jointing the same shall be adopted after necessary approval from the Engineer-In-Charge.

Rate shall be paid per running meter of pipe supplied and lowered. The materials required for jointing casing pipe shall be supplied by the contractor. After drilling of bore has been upto certain depth or upto hard strata casing pipe or required length shall be lowered as directed necessary jointing materials shall be brought by contractor, casing pipe shall be fixed in true vertical position.

Rate shall be paid per running meter of casing pipe fixed as directed.

Item No. 146

Providing and fixing 200mm dia MS Plate cap with locking arrangement.

M.S. plate shall be of required outside dia. It shall be of good quality and suitable for capping the bore. The plate cap shall be fixed with nut bolt, at the end of pipe. The casing pipe shall be closed with plug tightly. At top of casing pipe locking arrangement shall be made by the contractor after testing of bore.

The payment shall be made on Number basis M.S. plate cap provided and fixed.

Item No. 150

Supplying of murrum binding materials upto any lead.

1. Material for the purpose shall be approved quality. Any material which is found inferior shall be rejected and the contractor shall remove such rejected material from the site at his own cost. The material shall be collected from quarries approved by the Executive Engineer. The material shall be granular gritty.
2. The material shall be got approved by the Executive Engineer prior to collection on site. It shall be free from all rubbish, dust and any organic materials as well as clods of black cotton soils. Materials shall not be allowed to be collected from within the road boundary. Material to be used as crust and for side shoulders shall be as per C.B.R. report and that to be used as bindage in W.B.M. road construction shall have P.I. value of less than 6 as determined in accordance with IS 2720 (Part-V). The material to be used should be got tested prior to its use in road construction. Testing charges shall be borne by the contractor.
3. River or nala or sea sand required for the work shall be clear, sound, properly, graded, free from organic materials silt clay etc. and shall be got approved by the Engineer-in-charge. The sand shall be obtained and brought from the source approved by the Engineer-in-charge. The payment shall be made on cubic metre basis.
4. Stacking shall be done by filling in the standard steel boxes of 2m x 1.5m size which shall be supplied by the Department if available on rent, otherwise contractor shall make his own arrangement. No deduction for voids shall be made from the grade measurements. Where any doubt exists as to whether the quantity of stacks of murrum in an hectometer is not confirming with the cubic content of the standard pharas (2 x 1.5 x 0.5m) the same shall be got corrected by the contractor if so ordered by the Engineer-in-charge for which no extra payment shall be claimed by the contractor. If the quantity of murrum in any stack in a particular hectometer is found to be less than the standard measurements viz. 1.5 cmt the entire collection in the hectometer shall be paid on the basis of the quantity so found. Regular stacks shall be done by the Contractor on a fairly level ground stacking of the murrum shall be done in a manner as directed by the Engineer-in-charge.
5. For road work completed stacking of murrum as per requirement shall be carried out in 2 km length before spreading. The collection shall always, be commenced at one end of the k.m. and be carried continuously toward the other end unless the Engineer-in-charge shall direct otherwise.
6. The payment shall be made on cubic metre basis without deduction for voids. The contractor shall maintain all stacks in regular and proper size till the whole materials are collected, measured and finally accepted by the Department. The spreading of materials shall be not be allowed till the materials are fully stacked and completed kilometer wise.
7. The rate includes cost of collection, conveyance to the site with all lead and lift and filling the boxes including all labour, tools, equipment and other incidental expenses.
8. The rate quoted are inclusive of all shall such tools, duties, fees, royalties, taxes etc.

[b] Spreading of material shall be started after the full supply in a particular K.M. is collected, measured and recorded in the measurement books. Permission of the Engineer-in-charge shall be obtained before spreading. It shall be seen that the formation is dressed to the required camber and grade. If the murrum is to be spread over the metalled surface then the spreading shall be uniform and as it has to act as binding surface, it shall be used for filling the interstices of metal and forming a smooth running surface as far as possible. Murrum blindage shall be used then specified as blindage shall be spread evenly with a twisting motion of the baskets. No more murrum shall be used then specified as blindage. The rate is for gross measurements and no deduction of voids shall be made. If the murrum is to be spread over earthen embankment as a sub-base or for side shoulders or as blindage, it shall be spread in a manner as directed by the Engineer-in-charge and as per required width and thickness. The contractor shall make good all unevenness, depression, projections etc. during consolidation work. Rate of this item includes all these operations except consolidation. The payment shall be made on cmt. Basis.

Item No. 151

Spreading blindage or road crust filling the gapes in metal and levelling to camber and gradient as directed (I) Murrum.

1. Material for the purpose shall be approved quality. Any material which is found inferior shall be rejected and the contractor shall remove such rejected material from the site at his own cost. The material shall be collected from quarries approved by the Executive Engineer. The material shall be granular gritty.
2. The material shall be got approved by the Executive Engineer prior to collection on site. It shall be free from all rubbish, dust and any organic materials as well as clods of black cotton soils. Materials shall not be allowed to be collected from within the road boundary. Material to be used as crust and for side shoulders shall be as per C.B.R. report and that to be used as bindage in W.B.M. road construction shall have P.I. value of less than 6 as determined in accordance with IS 2720 (Part-V). The material to be used should be got tested prior to its use in road construction. Testing charges shall be borne by the contractor.
3. River or nala or sea sand required for the work shall be clear, sound, properly, graded, free from organic materials silt clay etc. and shall be got approved by the Engineer-in-charge. The sand shall be obtained and brought from the source approved by the Engineer-in-charge. The payment shall be made on cubic metre basis.
4. Stacking shall be done by filling in the standard steel boxes of 2m x 1.5m size which shall be supplied by the Department if available on rent, otherwise contractor shall make his own arrangement. No deduction for voids shall be made from the grade measurements. Where any doubt exists as to whether the quantity of stacks of murrum in an hectometer is not confirming with the cubic content of the standard pharas (2 x 1.5 x 0.5m) the same shall be got corrected by the contractor if so ordered by the Engineer-in-charge for which no extra payment shall be go claimed by the contractor. If the quantity of murrum in any stack in a particular hectometer is found to be less than the standard measurements viz. 1.5 cmt the entire collection in the hectometer shall be paid on the basis of the quantity so found. Regular stacks shall be done by the Contractor on a fairly level ground stacking of the murrum shall be done in a manner as directed by the Engineer-in-charge.
5. For road work completed stacking of murrum as per requirement shall be carried out in 2 km length before spreading. The collection shall always, be commenced at one end of the k.m. and be carried continuously toward the other end unless the Engineer-in-charge shall direct otherwise.
6. The payment shall be made on cubic metre basis without deduction for voids. The contractor shall maintain all stacks in regular and proper size till the whole materials are collected, measured and finally accepted by the Department. The spreading of materials shall be not be allowed till the materials are fully stacked and completed kilometer wise.
7. The rate includes cost of collection, conveyance to the site with all lead and lift and filling the boxes including all labour, tools, equipment and other incidental expenses.

8. The rate quoted are inclusive of all shall such tools, duties, fees, royalties, taxes etc.

[b] Spreading of material shall be started after the full supply in a particular K.M. is collected, measured and recorded in the measurement books. Permission of the Engineer-in-charge shall be obtained before spreading. It shall be seen that the formation is dressed to the required camber and grade. If the murrum is to be spread over the metalled surface then the spreading shall be uniform and as it has to act as binding surface, it shall be used for filling the interstices of metal and forming a smooth running surface as far as possible. Murrum blinding shall be used then specified as blinding shall be spread evenly with a twisting motion of the baskets. No more murrum shall be used then specified as blinding. The rate is for gross measurements and no deduction of voids shall be made. If the murrum is to be spread over earthen embankment as a sub-base or for side shoulders or as blinding, it shall be spread in a manner as directed by the Engineer-in-charge and as per required width and thickness. The contractor shall make good all unevenness, depression, projections etc. during consolidation work. Rate of this item includes all these operations except consolidation. The payment shall be made on cmt. Basis.

Item No. 155

Supplying and fixing Cat Eye (Stimsonite) made out from Acrilo beaultile sterine injuction high compressed molding with reflector made of MMC (prismatic type size 12cm x 6cm x 2.5cm) provided with bituminous adhesive 100g. with each unit for fixing. (High Intensity grade)

1.0 General

The colour, configuration, size and location of Cat eye (stimsonite) reflector for highways other than Expressways shall be in accordance with the code of Practice for Road Signs, IRC:67 or as shown on the drawings or as directed by the Engineer.

The Cat eye (stimsonite) reflector shall be reflectorised as shown on the drawings or as directed by the Engineer. It shall be of retro-reflectorised type and made of encapsulated lens type reflective sheeting vide Clause 801.3, fixed over aluminium sheeting as per these specifications.

In general, cautionary and mandatory signs shall be fabricated through process of screen printing. In regard to informatory signs with inscriptions, either the message could be printed over the reflective sheeting, or cut letters of non-reflective black sheeting used for the purpose which must be bonded well on the base sheeting as directed by the Engineer.

1.2 Materials :

The various materials and fabrication of the Cat eye (stimsonite) reflector shall conform to the following requirements.

The adhesive materials shall be of standard quality and it shall be high resistance quality against heavy moving vehicles.

The materials shall be used for the body of the Cat eye (stimsonite) reflector is of high density PVC materials.

The dimensions and size of the Cat eye (stimsonite) reflector shall be as per IS standard. The retro-reflective sheeting used on the cat-eye shall consist of the white or coloured sheeting having a smooth outer surface which has the property of retro reflection over its entire surface. It shall be weather resistant and show colour fastness. It shall be new and unused and shall show no evidence of cracking, scaling, pitting, blistering, edge lifting or curling and shall have negligible shrinkage or expansion. A certificate of having

tested the sheeting for these properties in an unprotected outdoor exposure facing the sun for two years and its having passed these tests shall be obtained from a reputed laboratory, by the manufacturer of the sheeting. The reflective sheeting shall be either of Engineering Grade material with enclosed lens or of High Intensity Grade with encapsulated lens. The type of the sheeting to be used would depend upon the type, functional hierarchy and importance of the road.

High intensity grade sheetings : This sheeting shall be of encapsulated lens type consisting of spherical glass lens, elements adhered to a synthetic resin and encapsulated by a flexible, transparent water-proof plastic having a smooth surface. The retro-reflective surface after cleaning with soap and water and in dry condition shall have the minimum co-efficient of retro-reflection determined in accordance with ASTM Standard E:810)

TABLE 800.1
ACCEPTABLE MINIMUM CO-EFFICIENT OF RETRO-REFLECTION FOR HIGH
INTENSITY GRADE SHEETING
 [CANDEL AS PER LUX PER SQUARE METRE]

Observation (in degree)	Entrance angle (in degree)	White	Yellow	Orange	Green/ Red	Blue
0.2	-4	250	170	100	45	20
0.2	+ 30	150	100	60	25	1.1
0.5	- 4	95	62	30	15	7.5
0.5	+ 30	65	45	25	10	5.0

When totally wet, the sheeting shall not show less than 90 percent of the values of retro reflective indicated in Table 800-1. At the end of 7 years, the sheeting shall retain at least 75 percent of its original retro-reflectance.

Engineer grade sheetings : This sheeting shall be of enclosed lens type consisting of microscopic lens elements embedded beneath the surface of a smooth, flexible, transparent, water proof plastic, resulting in a non-exposed lens optical reflecting system. The retro-reflective surface after cleaning with soap and water and in dry condition shall have the minimum co-efficient

of retro-reflection determined in accordance with ASTM Standard E:810) as indicated in Table 800.2.

TABLE 800.2
ACCEPTABLE MINIMUM CO-EFFICIENT OF
RETRO-REFLECTION FOR HIGH INTENSITY GRADE SHEETING
[CANDEL AS PER LUX PER SQUARE METRE]

Observation (in degree)	Entrance angle (in degree)	White	Yellow	Orange	Green	Red	Blue
0.2	-4	70	50	25	9.0	14.5	4.0
0.2	+ 30	30	22	7.0	3.5	6.0	1.7
0.5	-4	30	25	13.5	4.5	7.5	2.0
0.5	+ 30	15	13	4.0	2.2	3.0	0.8

When totally wet, the sheeting shall not show less than 90 percent of the values of retro reflective indicated in Table 800-2. At the end of 5 years, the sheeting shall retain at least 50 percent of its original retro-reflectance.

1.3 Processed and applied in accordance with recommended procedures, the reflective material shall be weather resistant and, following cleaning, show no appreciable discolouration, cracking, blistering or dimensional change and shall not have less than 50 percent of the specified minimum reflective intensity values (Table 800-1 and 800-2) when subjected to accelerated weathering for 1000 hours, using type E or EH Weatherometer (AASHTO Designation M 268).

1.4 INSTALLATION:

The Cat eye (stimsonite) reflector shall be installed directly on road surface, after cleaning completely by removing all dust and other foreign materials from the surface of the road.

1.5 MEASUREMENT FOR PAYMENT :

The measurement Cat eye (stimsonite) reflector shall be in numbers, these shall be measured in **No.**

1.6 RATE :

The Contract unit rate shall be payment in full for the cost of making Cat-Eye, including all materials, installing it at the site and incidentals to complete the work in accordance with the specifications.

Item No. 156

Road marking with Hot applied Thermoplast compound with reflectorising glass beads on bituminous surface and laying of hot applied thermostatic compound 2.5mm thick including reflectorised glass beads @ 250 grams / sq.mt. area, thickness of 2.5mm is exclusive of surface applied glass beads as per IRC 35. The finished surface to be level uniform and free from streaks & holes.

1.1. General

The colour, width and layout of road markings shall be in accordance with the code of practice of Road Markings with paints, IRC: 35 and specified in the drawings or as directed by the Engineer.

1.2. Materials

Road marking shall be of hot applied thermoplastic compound and reflectorised paint specified in the item and the material shall meet the requirements as specified below.

1.3 Hot Applied Thermoplastic Road Marking

1.3.1 General:

- (i) The work under this section consists of marking traffic stripes using a thermoplastic compound meeting the requirements specified herein.
- (ii) The Thermoplastic compound shall be screeded /extruded or to the pavement surface in a molten state by suitable machine capable of controlled preparation and laying with surface application of glass beads at a specific rate. Upon cooling to ambient pavement temperature, it shall produce an adherent pavement marking of specified thickness and width and capable of resisting deformation by traffic.
- (iii) The colour of the compound shall be white or yellow (IS colour no. 356) as specified in the drawings or as directed by the engineer.

1.3.2 Thermoplastic materials

1.3.2.1 General:

The thermoplastic material shall be homogeneously composed of aggregate, pigment, resins and glass reflectorizing beads.

1.3.2.2 Requirement:

In composition the pigment, beads and aggregate shall be uniformly dispersed in the resin. The material shall be free from all skins, dirt and foreign objects and shall comply with requirements indicated in Table 800:-3.

Table 800-3 PROPORTIONS OF CONSTITUTENTS OF MARKING MATERIAL

(Percentage by weight)

Component	White	Yellow
Binder	18.0 min.	18.0 min.
Glass Beads	30 - 40	30 - 40
Titanium dioxide	10.0 min.	–
Calcium Carbonate and Inert Fillers	42.0max.	See
Yellow pigments	–	Note

Note: Amount of yellow pigment, calcium carbonate and inert fillers shall be at the option of the manufacturer, provided all other requirement of this specification are

II Properties :

The properties of thermoplastic material, when tested in accordance with ASTM 036/IS-3262 (Part-I) shall be as below:

- A) Luminance:
White: Daylight luminance at 45 degree 65 percent min. as per AASHTO M 249.
- B) Drying time:
When applied at a temperature specification by the manufacturer and to the required thickness, the material shall set to bear traffic in not more than 15 minutes.
- C) Skid resistance: not less than 45 as per BS 6044
Cracking resistance at low temperature : The material shall show no cracks on application to concrete blocks.
- E) Softening point: 102.5 + 9.5 C as per ASTM 0 36.
- F) Flow resistance: Not more than 25 percent as per AASHTO M

249.

Yellowness index (for white thermoplastic paint) : not more than 0.12 as per AASHTOM 249.

III Storage Life : The materials shall meet the requirement of there specifications for period of one year. The thermoplastic material must also melt uniformly with no evidence of skins or un-melted particles for the one year storage period. Any material not meeting the above requirements shall be replaced by the manufacturer / supplier / contractor.

IV Reflectorisation : shall be achieved by incorporation of beads the grading and other properties of the beads shall be as specified in clause 803.4.3 of MORT&H specification.

V Marking: Each container of the thermoplastic material shall be clearly and indelibly marked with the following information.

The name, trademark or other means of identification of manufacturer.
Batch number. Date of manufacture.(Colour (white or yellow).

Maximum application temperature and maximum safe heating temperature.

- VI **Sampling and testing** : The thermoplastic material shall be sampled and tested in accordance with the appropriate ASTM/BS method. The contractor shall furnish to the employer a copy of certified test reports from the manufacturer of the thermoplastic material showing results of all tests specified therein and shall certify that the materials meets all requirements of this specification.

1.3.3 Reflectorizing glass beads:

- 1.3.3.1 **General** : The specification covers types of glass beads to be used for to production of reflectorised pavement markings.

Type 1 beads are those which are a constituent of the basic thermoplastic compound vide Table 800-3 and type-2 beads are those which are to be sprayed on the surface vide clause 803.6.3

- 1.3.3.2 The glass beads shall be transparent, colourless and free from miliness, dark particles and excessive air inclusions. This shall conform to the requirements spelt out in clause 803.4.3.3.

1.3.3.3 Specific requirements

- Gradation** : The glass beads shall meet the gradation requirements for the two types as given in Table 800-4.

TABLE 800-4 GRADATION REQUIREMENT FOR GLASS BEADS

Sieve size	Percent Retained	
	Type 1	Type 2
1.18 mm	0 to 3	-
850 micron	5 to 20	0 to 5
600 micron	-	5 to 20
425 micron	65 to 95	-
300 micron	-	30 to 75
180 micron	0 to 10	10 to 30
Below 180 Micron		00 to 15

Roundness : The glass beads shall have a minimum of 70 percent true spires.

Refractive index: The glass beads shall have a minimum refractive index of 1.50.

Free flowing properties: The glass beads shall be free of hard lumps and clusters and shall dispense readily under any conditions suitable for paints striping. They shall pass the free flow test.

1.3.3.4 Test methods : The specific requirement shall be tested with the following methods.

Free flow test: Spread 100 grams of beads evenly in a 100 mm diameter glass dish. Place the dish in a 250 mm inside diameter desiccators which is filled within 25 mm of the top of a desiccators plate with sulphuric acid water solution (specific gravity 1.10) cover the desiccators and let it stand for 4 hours at 20 to 29 degree C. Remove sample from desiccators, transfer beads to a pan and inspect for lumps or clusters. Then pour beads into a clean dry glass funnel having a 100 mm stem and 6 mm orifice. If necessary, initiate flow by lightly tapping the funnel. The glass spheres shall be essentially free of lumps and clusters and shall flow freely through the funnel.

II. The requirements of gradation, roundness and refractive index of glass beads and the amount of glass beads obtained from a reputed laboratory showing results of all tests specified therein and shall certify that material meets all requirements of this specification. However, if so required, these tests may be carried out as directed by the engineer.

1.3.4 Application properties of thermoplastic material.

1.3.4.1 The thermoplastic materials shall readily get screed/extruded at temperatures specified by the manufacturers for respective method of application to produce a line of specified thickness which shall be continuous and uniform in shape having clear and sharp edges.

1.3.4.2 The materials upon heating to application temperatures shall not exude fumes, which are toxic, obnoxious or injurious to persons property.

1.3.5 Preparation:

The materials shall be melted in accordance with the manufacturer's instruction in a heater fitted with a mechanical stirrer to give a smooth consistency to the thermoplastic materials to avoid local overheating. The temperature of the mass shall be within the range specified by the manufacturer and shall on no account be allowed to exceed the maximum temperature started by the manufacturer. The molten material should be used as expeditiously as possible and for thermoplastic materials which has natural binders or is otherwise sensitive to prolonged heating the materials shall be maintained in a molten condition for more than 4 hours.

ii) After transfer to the laying equipment the material shall be maintained within the temperature range specified by the manufacturer for achieving the desired consistency for laying.

1.3.6 Properties of finished road marking:

The stripe shall not be slippery when wet.

The marking shall not lift from the pavement in freezing weather.

After application and proper drying the stripe shall show no appreciable deformation or discoloration under traffic and under road temperatures up to 60 C.

The marking shall not deteriorate by contact with sodium chloride calcium chloride or oil drippings from traffic.

The stripe of marking shall maintain its original dimension³ and position.

Cold ductility of the material shall be such as to permit normal movement with the road surface without chopping or cracking.

The colour of yellow marking shall conform to IS colour no. 356 as given in IS : 164.

Reflectorised Paint: Reflectorised paint, if used, shall conform to the specification by the manufacturers and approved by the engineer. Reflectorising glass beads for reflectorising paints where used shall conform to the requirements of clause 803.4.3.

Application

1.3.7 Marking shall be done by machine. For locations where painting cannot be done by machine, approved manual methods shall be used with prior approval of the engineer. The contractor shall maintain control over traffic while painting operations are in progress so as to cause minimum inconvenience to traffic compatible with protecting the workmen.

1.3.8 The thermoplastic materials shall be applied hot either by sereeding or extrusion process. After transfer to the laying apparatus, the material shall be laid at a temperature within the range specified by the manufacturer for the particular method of laying being used. The paint shall be applied using a screed or extrusion machine.

1.3.9 The pavement temperature shall not be less than 10 C during application.

All surfaces to be marked shall be thoroughly cleaned of all dust, dirt, grease, oil and all other foreign matter before application of the paint.

The material, when formed into traffic stripes, must be readily renewable by placing on overlay of new material directly over an old line of compatible material. Such new material shall so bond itself to the old line that no splitting or separation takes place.

Thermoplastic paint shall be applied in intermittent or continuous lines of uniform thickness of at least 2.5 mm unless specified otherwise. Where arrows or letters are to be provided, thermoplastic compound may be hand-sprayed. In addition to the beads included in the material, a further quantity of glass beads of type-2, conforming to the above noted specification shall be sprayed uniformly into a monolayer on to the hot paint line in quick succession of the paint spraying operation. The glass beads shall be applied at the rate of 250 grams per square meter area.

1.4.4 The minimum thickness specified is exclusive of surface applied glass beads. The method of thickness measurement shall be in accordance with appendices B and C of BS - 3262 (Part-3)

1.4.5 The finished lines shall be free from ruggedness on sides and ends and be parallel to the general alignment of the carriageway. The upper surface of the lines shall be level, uniform and free streaks.

1.5 Measurement for Payment:

1.5.1 The painted marking shall be measured in sq. meters of actual area marked (excluding the gaps, if any).

1.5.2 In respect of markings line directional arrows and lettering, etc. the measurement shall be by numbers.

1.6 Rate: The contractor unit rate for road markings shall be payment in full compensation of furnishing all labour, materials, tools, equipment, including all incidental costs necessary for carrying out the work at the site confirming to these specification complete as per the approved drawing(s) or as directed by the engineer and other incidental cost necessary' to complete the work to these specifications.

Item No: 157

Providing and fixing Rubber Speed Breaker of Size-500 (L) x 350 (W) x 50(H) of 2 pieces in 1 Meter (1 No. Yellow & 1 No. Black) installation with 4 inch zink plated 12mm thick bolt with epoxy hardner etc. Complete as per direction of Engineer incharge.

Materials:

Rubber Speed Breaker shall be of specified size as 500 (L) x 350 (W) x 50(H). Length of bolt shall be of specified size as 4 inch zink plated 12mm thick bolt.

Workmanship:

Mark the hole locations and drill holes using suitable drill bit. Locate the speed breaker and fasten the same using bolts with epoxy hardner.

Rubber Speed Breaker shall be arranged alternatively in black and yellow colors. Two end pieces are provided for each length of speed breakers.

Mode of measurement and payment:

The rate including cost of all materials, tools, plants and labour involved in satisfactory completion of this item. The rate shall be for unit of one running meter. The work shall be carried out as per directed by E.I.C.

Item No. 158

Providing and fixing CAPCELL HD 100 pre- moulded compressible filler board in black colour confirming to MORT&H Specifications (Clause 1015).

12 To 20 mm thickness of SILFLEX (CAPCELL HD - 100) pre-moulded compressible filler board in black colour confirming to MORT&H Specifications (Clause 1015)

Minimum density 95kg/cum.metre, non-staining with less than 1% water absorption & compression recovery of 93% minimum as per specification for 20 mm wide & 100 mm deep Expansion Joint finished or sealed with two component pre-packed capable of + or -20% of joint movement sealing compound of elastic PU coal tar .

Mode of payment & Measurement :

Rate shall be paid on Unit of Sq. mtr. Area basis. Rate including all labours materials and operations.

Item No. 159

Providing and fixing 25 mm diameter backup rod having minimum density 22 kg per cum (ASTMD - 3575) & compression strength of 0.40 kg per sqm (ASTM 5249) and finishing with polysulphide sealant etc. complete. For 20 mm wide expansion joint

Materials for Joint Sealing**Joint Sealing**

The joint sealing compound shall be of hot poured, elastomeric type or cold polysulphide type having flexibility, durability and resistance to age hardening.

Manufacturer's certificate shall be produced by the contractor for establishing that the sealant is not more than six months old and stating that the sealant complies with the relevant standard mentioned below.

The material for cold poured joint sealant shall conform the following: Polysulphide IS:11433(Part I)-1985(Reaffirmed 2020), BS:5212 (Part II)

Steel Forms

All side forms shall be of mild steel. The steel forms shall be of M.S. Channel sections and their depth shall be equal to the thickness of the pavement.

The use of bent, twisted or worn out forms shall not be permitted.

Mode of payment & Measurement :

Rate shall be paid on Unit of running metres . Rate including all labours materials and operations.

Item no : 160

Providing Groove cutting in C.C. Road in cluing cleaning etc. complete as per direction of Engineer in charge

Groove Cutting is cutting the laid concrete providing grooves of size 5mm wide and one third of the thickness of the concrete (or as required at site) within 48 hours of laying of the concrete.

Form bays of 3Mtrs X 3Mtrs using heavy duty cutting machine with diamond cutting wheel and filling of the grooves with appropriate sealant.

Cleaning the groove with air compressor.

Mode of payment & Measurement :

Rate shall be paid on Unit of running metres . Rate including all labours materials and operations.

Item No. 161**Providing pre-moulded asphalt filler joints as per drawings (A)12 mm**

1. Open joints shall be constructed at the locations as directed by the Engineer-in charge using a wood strip, metal plate, other suitable material which is subsequently removed. When removing the material, care shall be exercised to avoid chipping or breaking the corners of the concrete. The edge of the concrete at the joints shall be edge finished. Reinforcement shall not extend across as open joint.
2. When performed filler is to be provided the filler shall be placed in correct position before concrete is placed against the filler. The filler material shall form part of the joint and while concreting the slab, care shall be taken to prevent the former from being displaced. After the work is completed, the exposed face of the joint shall be cleaned of all loose material sticking to it.
3. The material used for filling expansion joint shall be bitumen impregnated felt which shall conform to the requirements of IS: 1838, and shall be got approved from the Engineer in-charge. The joint shall consist of large pieces and assembly of small pieces to make up the required size shall be avoided.

Mode of payment & Measurement :

The expansion joint shall be measured in Sqmt. Thickness of the expansion joint will be 12 to 20 mm. Width of the expansion joint shall be equal to full depth of the slab.

The rate shall include the cost of all materials, labour, equipments and other incidental charges for fixing the joints complete in all respect as per these specifications.

Item No.164

Job Work of Geohydrological ground water investigation including water sample chemical analysis including Pin-Point survey. [with Veichel Charges]

The Job of Geohydrological ground water investigation shall be carried out as Per G.W.S.S.B. manual and pin point survey shall be contractor all the liason work for the Geohydrological & pin point marking at site with GWSSB Shall be carried out by contractor at his own cost and finally report of Geohydrological and pin point survey shall be submitted to the Engineer-in-Charge of GSPHC limited.

The quality of water shall be tested for all the physical, chemical and Bacteriological parameters as normally done for any drinking water sample. The water sample for bacteriological analysis shall be collected from the Representative of the public health Engineering laboratory/GWSSB Laboratory or the laboratory as directed by the Engineer-in charge of GSPHC Limited.

The rate shall be for entire job.

Item No. 165

Supplying of bore plug of made from 5mm thick M.S. plate with 3 holes at equal distance on circumstances for nut bolt and locking arrangements.

M.S. bore plug shall be of required outside dia. It shall be of good quality and suitable for fit in coupling. The plug shall be fixed with nut bolt, at the end of pipe. The casing pipe shall be closed with plug tightly. At top of casing pipe locking arrangement shall be made by the contractor after testing of bore.

The payment shall be made on Number basis M.S. bore plug provided and fixed.

Item No.166

Pumping test of the Bore well by submersible pump of adequate capacity & with necessary pumping machinery & pipe line running minimum for 24 hours including submission of Bore chart & discharge of Bore.

Submersible pump set of adequate capacity shall be lowered at required depth and run for minimum 24 hours arrangement of providing, lowering and running of suitable pumping machinery including electric power for this test shall have to be done by contractor at his own cost, for electric power supply, temporary arrangement shall be done by contractor at his own cost, details of discharge with provided pumping machinery, details shall be submitted to the Engineer-in-charge.

The Rate shall be for a Unit of 1 Job lump sum basis.

Item No- 167

Providing, fixing, testing and commissioning of MS class C ISI Marked pipe line with jointing and fitting materials clamps & screws erecting masonry supports including wrapping of pipe with bitumenous cloth complete

(A) 150mm dia MS Pipe,

Material: - M.S. Pipe 150mm

Class: - 'C' Class

Standard: - Relevant IS or as directed

Pipe end:- Plain/beveled

Painting:- Two coats of primer & two coats of Synthetic enameled paint shall be applied on the pipe before lowering the pipe as directed (Tac-approved paint) & warping of pipe with bituminous cloth complete or as directed.

Workmanship:-

Based on the approved drawing the contractor shall supply and do fabrication and erection, testing, painting & commissioning of M.S pipes 150mm dia with jointing & fitting materials, clamps & screws & fixing pipe with supports as directed. During erection of the pipe line, necessary excavation, refilling the trenches, making of necessary masonry & all type of supports & also necessary holes to slab, beam, masonry walls, flooring should be carried out in such a manner that the structure may not be disturbed. Repairing & finishing of holes shall be carried by the contractor at his own cost as directed by the engineer in charge with PCC, RCC & with bituminous filler etc. completed or as directed.

Mode of measurement & payment:-

Measurement & payment of the pipe lines shall be as per the running meter basis.

(B) 100mm dia MS Pipe

Material: - M.S. Pipe 100mm

Class: - 'C' Class

Standard: - Relevant IS or as directed

Pipe end:- Plain/beveled

Painting:- Two coats of primer & two coats of Synthetic enameled paint shall be applied on the pipe before lowering the pipe as directed (Tac-approved paint) & warping of pipe with bituminous cloth complete or as directed.

Workmanship:-

Based on the approved drawing the contractor shall supply and do fabrication and erection, testing, painting & commissioning of M.S pipes 100mm dia with jointing & fitting materials, clamps & screws & fixing pipe with supports as directed. During erection of the pipe line, necessary excavation, refilling the trenches, making of necessary masonry & all type of supports & also necessary holes to slab, beam, masonry walls, flooring should be carried out in such a manner that the structure may not be disturbed. Repairing & finishing of holes shall be carried by the contractor at his own cost as directed by the engineer in charge with PCC, RCC & with bituminous filler etc. completed or as directed.

Mode of measurement & payment:-

Measurement & payment of the pipe lines shall be as per the running meter basis.

(C) 80mm dia MS Pipe.

Material: - M.S. Pipe 80mm

Class: - 'C' Class

Standard: - Relevant IS or as directed

Pipe end:- Plain/beveled

Painting:- Two coats of primer & two coats of Synthetic enameled paint shall be applied on the pipe before lowering the pipe as directed (Taco-approved paint) & warping of pipe with bituminous cloth complete or as directed.

Workmanship:-

Based on the approved drawing the contractor shall supply and do fabrication and erection, testing, painting & commissioning of M.S pipes 80mm dia with jointing & fitting materials, clamps & screws & fixing pipe with supports as directed. During erection of the pipe line, necessary excavation, refilling the trenches, making of necessary masonry & all type of supports & also necessary holes to slab, beam, masonry walls, flooring should be carried out in such a manner that the structure may not be disturbed. Repairing & finishing of holes shall be carried by the contractor at his own cost as directed by the engineer in charge with PCC, RCC & with bituminous filler etc. completed or as directed.

Mode of measurement & payment:-

Measurement & payment of the pipe lines shall be as per the running meter basis

necessary holes to slab, beam, masonry walls, flooring should be carried out in such a manner that the structure may not be disturbed. Repairing & finishing of holes shall be carried out by the contractor at his own cost as directed by the engineer in charge with PCC, RCC & with bituminous filler etc. completed or as directed.

Mode of measurement & payment:-

Measurement & payment of the pipe lines shall be as per the running meter basis

(D) 25mm dia MS Pipe.

Material:- M.S. Pipe 25mm

Class:- 'C' Class

Standard:- Relevant IS or as directed

Pipe end:- Plain/beveled

Painting:- Two coats of primer & two coats of Synthetic enameled paint shall be applied on the pipe before lowering the pipe as directed (Taco-approved paint) & warping of pipe with bituminous cloth complete or as directed.

Workmanship:-

Based on the approved drawing the contractor shall supply and do fabrication and erection, testing, painting & commissioning of M.S pipes 25mm dia with jointing & fitting materials, clamps & screws & fixing pipe with supports as directed. During erection of the pipe line, necessary excavation, refilling the trenches, making of necessary masonry & all type of supports & also necessary holes to slab, beam, masonry walls, flooring should be carried out in such a manner that the structure may not be disturbed. Repairing & finishing of holes shall be carried out by the contractor at his own cost as directed by the engineer in charge with PCC, RCC & with bituminous filler etc. completed or as directed.

Mode of measurement & payment:-

Measurement & payment of the pipe lines shall be as per the running meter basis

Item No. 168

Providing and fixing of CI Sluice/ Butterfly valve ISI marked with gunmetal working parts with stainless steel spindle with necessary jointing materials fitting etc. complete as directed.

- [A] 150 mm dia
- [B] 100 mm dia.
- [C] 80 mm dia.

Sluice gate valve shall be of best quality and of approved make and shall confirm the relevant IS-780. All working parts shall be gun metal. Few turns of fine hamp yarn dipped in white zinc shall be taken over threaded end of the pipe and socket ends of the sluice valve shall be screwed even the pipe with necessary appliances or as directed.

Workmanship:-

The workmanship shall be as per the specification of the It no 28(23.99) P.no-115 para 2.00 of general technical specification for building work booklet. Except that is for C.I slave or butterfly valve instead of Gun metal check or non-return valve & Item is for 100mm / 80mm dia or as directed.

Mode of measurement & payment:-

Item shall be measured & paid on number basis.

Item No. 169

Providing, fixing, testing and commissioning of non-return valve of following sizes conforming to IS: 5312 complete with rubber gasket, GI bolts, nuts, washers etc. as required.

- [A] 150 mm dia
- [B] 100 mm dia.
- [C] 80 mm dia.

Non return valve shall be of best quality and of approved make as per IS-5312 latest additional. All working parts shall be gun metal a few turn of fine hemp yarn dipped in white Zink shall be taken over the threaded ends of pipe and socket ends of valve or as directed. Non return valve shall be screwed over the pipe with necessary appliances or as directed.

Workmanship:-

Non return valve shall be fixed as directed by the engineer in charge.

Mode of measurement & payment:-

Item shall be measured & paid on number basis.

ITEM NO : 170

Supplying and fixing orifice plate made out of 6 mm thick stainless steel (Grade 304) with orifice of required size to be fitted between flange & landing valve of external and internal hydrants to reduce pressure at the outlet to the level of 3.5 kg/cm² complete as required.

Providing & fixing orifice plate on fire hydrant valve including jointing materials having suitable base for reducing the pressure hydrant outlet etc. as directed.

The orifice plate of suitable dia with bolt holes same hydrant shall be made of copper having a suitable orifice size in center to reduce the pressure to 3.20 kg/cm²

Workmanship:

The plate shall be installed before the hydrant valve with best workmanship to achieve the coerces pressure of hydrant valve without any leakage.

Mode of measurement & payment: Item shall be measured & paid on number basis.

ITEM NO: 171

Providing, fixing, testing and commissioning of Standard Gun /SS metal branch pipe with nozzle of 20 mm etc...

63mm dia gun metal/ SS Single headed ISI marked oblique pattern hydrant landing valves as per the IS-5290 with 80mm dia flanged inlet & 63 mm dia female outlet completed with instantaneous coupling of gun metal best quality & make shall be fixed or as directed.

All working parts shall be of gun metal /SS, the hard wheel shall be operated in clock wise and antic lock wise direction or as directed.

Mode of measurement & payment:-

Item shall be measured & paid on number basis.

ITEM NO. 172

Providing and fixing 63 mm dia reinforced rubber lined RRL fire hose of approved brand conforming to IS 636 type A having brushing pressure of 37.20 Kg/cm² and 2 Nos of ISI marked of 15 mtr length fitting with necessary gun metal 63 mm delivered hose pipe with 63 mm dia. Male and female gun metal couplings duly binded with GI wire, rivets etc. conforming to IS 636 (type-A) as required.

Material & Workmanship :

Hoses pipes shall be of fabric reinforced rubber lines as per IS:636 Type A or canvas hose as per IS:4927, with nominal size of 63 mm and lengths of 15 meter as per quantities specified for in schedule or bill of quantity.

All hose pipes shall carry ISI marking on the body of the hose.

The hose shall have instantaneous spring lock-type coupling on ends. The instantaneous coupling shall be as per IS:901. It shall be fixed to each other by copper rivets and galvanized M.S. wires and leather bands. All coupling shall be interchangeable with each other, and shall bear ISI markings.

Mode of measurement :

Measurement shall be in number executed.

Item No. : 173

Providing, fixing, testing and commissioning of Weather proof standard fire hose cabinet wall mounting type(750mm x 600mm x 250 mm deep) having single opening with M.S. Fabricated Stand, necessary locking arrangement by allan key suitable for housing 2 nos. hose pipe, 1no. Branch pipe & nozzle spanner.

Material & Workmanship:

The hydrant cabinet shall hold 2 hoses, one branch pipe & nozzle spanner as required. The cabinet shall be of minimum 18 Gauge M.S. sheet with center opening, double glass front doors (cleat glass of 4mm thickness). The glass shall be firmly fixed by means of steel clips and screw with rubber beading. Hinges shall also be screwed and not welded. The corner members (frame) shall be of 25 x 25 x 3 mm thick angle. The hose box shall be firmly fixed to the wall/support by means of brackets and dash fasteners. The steel work shall have one coat of primer and two coats of red paint. The words "Internal Hydrant" etc. should be painted in white or red on the glass in 75 mm high letters. The hose box shall be lockable. Hose box shall be as mentioned in BOQ.

Mode of measurement :

Measurement shall be in number executed.

Rate shall be in unit of No. basis.

Item No. : 174

Supplying and fixing specially designed SS 304 orifice plates (minimum 6 mm plate thickness) to be fitted between flange and landing valve of external & internal hydrant outlets of hydrant valves for reducing delivery pressure to 3.5 kg/ sq.cm at hydrant valve

Providing & fixing orifice plate on fire hydrant valve including jointing materials having suitable base for reducing the pressure hydrant outlet etc. as directed.

The orifice plate of suitable dia with bolt holes same hydrant shall be made of copper having a suitable orifice size in center to reduce the pressure to 3.20 kg/cm²

Workmanship:

The plate shall be installed before the hydrant valve with best workmanship to achieve the coerces pressure of hydrant valve without any leakage.

Mode of measurement & payment:

Item shall be measured & paid on number basis.

Item No- 175

Supplying and fixing First Aid hose reel with MS construction spray painted in post office red, conforming to IS 884 with upto date amendments, complete with the following as required. 30m long 25mm (nominal internal) dia water hose thermoplastic (textile reinforced) type-2 as per IS: 12585 25mm (nominal internal) dia S.S. Shut up valve & nozzle. Drum and brackets for fixing the equipment's on wall. Connections from riser with stop valve (GM) & M.S. pipe.

First aid hose reel should be made of aluminum along with M.S sheet side with spray painted in post office red conforming to IS-884 with up to date amendments. Complete with 30.00 long 25mm nominal internal dia water hose thermoplastic (textile reinforced) type-2 as per IS-12585 or as directed 25mm nominal internal diameter S.S shutup valve & nozzle
Entire assemble of drum and baskets shall be installed on the wall with connections from riser with stop valve & M.S. pipe or as directed.

Mode of measurement & payment:-

Item shall be measured & paid on number basis.

Item No. : 176

Supplying and fixing single headed internal hydrant valve with instantaneous Stainless Steel coupling of 63 mm dia with cast iron wheel ISI marked conforming to IS 5290 (Type -A) with blank Gunmetal/Stainless Steel cap and chain as required. With all necessary required tools and hardware.

Material & Workmanship :

Internal hydrant shall be provided at each landing or at suitable location consisting of single / twin headed gunmetal landing valve as indicated in BOQ with 63 mm dia oblique female instantaneous pattern with caps & chains. Outlet and 80 mm inlet (IS: 5290-1969) with separate shut off valve. Landing valves shall be 63 mm dia. oblique female instantaneous pattern with caps and chains. Landing valves shall be of gunmetal and fitted with instantaneous coupling conforming to IS: 901. The valve body, stop valve, check valve, nut, instantaneous female outlet and blank cap shall be of leaded-tin bronze conforming to Grade-II of IS: 318-1962. The valve spindle shall be of brass rod conforming IS: 320 - 1962. The hand wheel shall be mild steel or cast iron washers gaskets shall be of rubber conforming to IS:638 - 1965 or leather conforming to IS:581 : 1969. The coupling shall be fitted with an internal plug secured by chain landing valves shall be installed on hydrant riser at a height of 1.0 to 1.2 meter from the floor level.

Each internal hydrant shall be provided with two nos. 63 mm. Diameter 15 mtr. Long hose pipe with gunmetal /SS male and female instantaneous type coupling, machined wound with G.I. wire hose of IS 636 type A and couplings to IS:903 with IS certification, gunmetal /SS branch pipe with nozzle conforming to IS:903. Hydrant shall be tested at 15 kg/cm² pressure for minimum 2 hours pressure.

Mode of measurement:

Measurement shall be in number executed including fitting, supports & painting

Item No. 177

Providing & fixing SITC of test & drain assembly with all piping, sight glass, 25mm dia. test & drain valve etc complete.

SITC of test & drain assembly with all piping, sight glass, 25mm dia. shall be of best quality and of approved make and shall confirm the relevant IS-780. All working parts.

Workmanship:-

The workmanship shall be as per the specification of the It no 28(23.99) P.no-115 para 2.00 of general technical specification for building work booklet. Except that is for SITC of test & drain assembly with all piping, sight glass, 25mm dia. test & drain valve or as directed.

Mode of measurement & payment:-

Item shall be measured & paid on number basis.

ITEM No- 178

Supply & Installation of Mainfold for fire hydrant distrubution 200 mm dia system as directed.

25mm dia gunmetal S.S gate valve with 25mm dia nipple shall be of best quality and of approved make and shall confirm the relevant IS

All working parts shall be gun metal / SS few turns of fine hemp yarn dipped in white zink shall be taken over threaded ends of the pipe and socket ends of the gate valve with nipple shall be screwed even the pipe with necessary appliances

Workmanship:-

The workmanship shall be as per specification of Item no 28(23.99) P.115 para 2.00 of general specification for building work booklet except that is for 25mm dia gun metal ISI mark SS Gate valve with 15mm dia nipple instead of gun metal check or non-return valve or as directed.

Mode of measurement & payment:-

Item shall be measured & paid on one set basis.

Item No- 179

Providing & fixing emergency escape signs printed on rigid PVC sheet / acrylic sheet 4 mm thick photo luminescent auto glow type of approved quality including fixing on door, wall, ceiling complete with installation as directed.

(A)Escape signs

Emergency escape signs printed on rigid PVC sheet/Acrylic sheet 4 mm thick photo luminescent auto glow type of approved quality or as directed.

Emergency escape signs shall be fixed on door,wall,ceiling with necessary fixing accessories or as directed.

The entire work shall be carried out as per the requirement & satisfaction of the engineer in charge. The work shall be carried out in the best workman like manner or as directed.

Mode of measurement & payment:-

Item shall be measured & paid on square inch basis.

(B)Fire signs

Emergency Fire Signs printed on rigid PVC sheet/Acrylic sheet 4 mm thick photo luminescent auto glow type of approved quality or as directed.

Emergency Fire signs shall be fixed on door,wall,ceiling with necessary fixing accessories or as directed.

The entire work shall be carried out as per the requirement & satisfaction of the engineer in charge. The work shall be carried out in the best workman like manner or as directed.

Mode of measurement & payment:-

Item shall be measured & paid on square inch basis.

Item No- 180

Making of Core in RCC work of size 200 mm etc. complete RCC Core Cutting

The core size should be 200mm as specified.

Workmanship:

Clearance requirements of the core hole are the responsibility of the agency and should be determined prior to starting work.

Mechanical equipment use for core cutting as per industry standard.

Agency should prohibit access and clear machinery or equipment directly under the area to be core drilled so that falling cores do not injure any persons or damage any property.

Mode of measurement and payment:

The rate including cost of all materials, tools, plants and labour involved in satisfactory completion of this item. The rate shall be for unit of one numbers.

The work shall be carried out as per directed by E.I.C.

Item no 181

Getting provisional NOC and Final NOC and Renewal of NOC (During Defect Liability Period) for Fire Hydrant, Sprinkler system, Fire Extinguisher, Fire alarm system etc. from local fire authority or any other relevant statutory authority initial stage and required various other stages of construction work, including preparation of reports /drawings as per fire authority requirement. Rate also include renewal of Fire NOC during defect liability period as per requirement. Main agency has to give demonstration of all fire system to fire officer police / concern beneficiaries & GSPHCL. Agency has to submit FDR of approved bank as per clause 2.0, section 3, of Rs 20000.00 Or Quoted rate which ever is higher to GSPHCL for minimum maturity period of Four years in favour of GSPHC, which will be released after Successful Submitting of All Fire NOC at the completion of defect liability period. Renewal Fire N.O.C. shall be submitted final S.D. proposal. Agency has to borne charges like preparing and submission of all the documents, Photographs, CD/DVD required to get the N.O.C. from concern fire department and also liaising work with concern departments. Main civil agency has to get the pre-NOC from fire & emergency department well before starting civil & the fire hydrant work including sump & pump room work. For that professional & experience fire agency has to prepare drawing of fire hydrant system, sprinkler system, fire alarm system, DG set etc. as per tender item and making floor layout of all fire pump panel, cable earthing etc in pump room. If any changes required in drawings of sump & pump room. Main agency has to inform in written before excavation of pump & sump room. Agency has to calculate the total head & discharge required as per NBC/local fire office requirement and as per site situation and submit fire pump OEM specification curve foundation detail etc & get approval of cable, panel drawings & specification. After completion of fire hydrant related work as per pre-NOC, tenders specification & drawing approved by fire department, agency has to do site visit with fire department & give the testing & demonstration to fire officer & get the final NOC before handing over of the building. Agency has to give live testing & demonstration of all system to GSPHCL & police department jointly. For fire NOC fee separate item is taken in tender. Agency has to quote the rate as per latest Gazette in respective tender item.

1. Getting provisional NOC and Final NOC and Renewal of NOC for Fire Hydrant, Sprinkler system, Fire Extinguisher from local fire authority or any other relevant statutory authority at initial and at required various other stages of construction work till defect liability period.
2. Preparing of reports/drawings as per fire authority requirement for NOC approval.
3. Contractor should prepare all documents for Renewal of Fire NOC each year during defect liability period.
4. All Testing of Fire Fighting System shown to Fire Chief Officer or related officer as per Guide Line by the contractor. If any query occurs then final decision of Fire authority or engineer in charge will be final.

Mode of measurement & payment: -The rate includes preparing and submission of all the documents, Photographs, CD/DVD required to get the provisional NOC and Final NOC and Renewal of NOC from concern fire department and also liaising Work with concern departments. Rate also includes renewal of Fire NOC each year during defect liability period. The legal and other charges to get N.O.C. also will be born by contractor to involved in satisfactory completion of work. Agency has to submit FDR of approved bank as per clause 2.0, section 3, of Rs 20000.00 Or Quoted rate which ever is higher to GSPHCL for minimum maturity period of Four years in favour of GSPHC, which will be released after Successful Submitting of All Fire NOC at the completion of defect liability period. Each year Renewal of Fire N.O.C. to be submitted at with Last S.D. proposal released by Department. The rate shall be for unit of Job/each.

I/C Ex Engineer
G.S.P.H.C.Ltd
Junagadh