

STANDARD BIDDING DOCUMENT

PROCUREMENT OF

CIVIL WORKS

COMPLETE BIDDING DOCUMENT

VOLUME-II

NAME OF WORK :

Construction of Revenue Staff quarters (C type-4 Unit, B type-4 Unit, D type-1 Unit) at Jetpur, Dist.Rajkot



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**GOVERNMENT OF GUJARAT
ROAD AND BUILDING DEPARTMENT**

This is a generic SBD to be used for Civil works. Each user/concern department needs to examine and put up their particular bidding requirement like; qualification criteria, contract Data etc., marked at [#] while finalizing their own bidding process.

SECTION - 5
TECHNICAL SPECIFICATION

Name of work :- Construction of Revenue Staff Quarters (C type - 4 unit, B type - 4 unit, D type - 1 unit) at Jetpur , Dist Rajkot.

SPECIFICATION INDEX

Item No.	Item Description	Page No. as per Std. booklet	Item No. as per Std. specification	Remarks
1	2	3	4	5
1	Excavation for foundation upto all depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto all Meter lead.(A) Loose or soft soil	29	4.00.A	The work shall be carried out for all depth and all lead instead of 1.5 m depth and 50 m lead
2	Excavation for foundation upto all depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto all Meter lead.(B)Dense or Hard soil	29	4.0.0.B	The work shall be carried out for all depth and all lead instead of 1.5 m depth and 50 m lead
3	Excavation for foundation upto all depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto all Meter lead.(C) Hard Murrum	29	4.0.0.C	The work shall be carried out for all depth and all lead instead of 1.5 m depth and 50 m lead
4	Excavation for foundation for depth all including sorting out and stacking of useful materials and disposing off the excavated stuff upto all Meter lead. (D) Soft rock not requiring Blasting	32	4.0.0.D	The work shall be carried out for all depth and all lead instead of 1.5 m depth and 50 m lead

5	Providing and laying cement concrete 1:2:4 (1- Cement : 2- Coarse sand : 4- graded stone aggregates 20 mm nominal size) and curing complete including cost of formwork in (A) Foundation and Plinth	43	5.4.1 (A)	
6	Providing and laying cement concrete 1:2:4 and curing etc complete, including the cost of formwork and the cost of reinforcement, for R.C.C. work in Floor Grade Slab	43	5.4.1 (C)	
7	Providing and laying controlled c.c.M.250 & curing complete including the cost of form work but excluding the cost of reinforcement for reinforced concrete work in foundation, footing bases of columns and the like and mass concrete.	47 63	5.8.3 (A) 9.1 A (I)	The payment shall be made for completed item on Cum. basis.
8	Providing and laying Controlled cement concrete M 250 and curing complete including the cost of formwork and excluding cost of reinforcement for reinforced concrete work in Column up to Plinth Level	47 65	5.8.3 (D) 9.1 G (I)	The payment shall be made for completed item on Cum. basis.
9	Providing and laying Controlled cement concrete M 250 and curing complete including the cost of formwork and excluding cost of reinforcement for reinforced concrete work in Plinth Beam .	47 65	5.8.3 (C) 9.1 H (I)	The payment shall be made for completed item on Cum. basis.
10	Providing and laying controlled Cement Concrete M.200 & curing complete including the cost of form work but excluding the cost of reinforcement for reinforced concrete work in Lintel for all Floor	42 66 45	5.8.3 (C) 9.1. (M) 5.4.13	The payment shall be made for completed item on Cum. Basis for all floor.
11	Providing and laying controlled cement concrete M.200 & curing complete including the cost of form work but excluding the cost of reinforcement for reinforced concrete work in Column for all Floor	47 65 45	5.8.2 (D) 9.1 G (I) 5.4.13	The payment shall be made for completed item on Cum. basis.
12	Providing and laying controlled cement concrete M - 200 with curing etc complete, including the cost of formwork but excluding the cost of reinforcement, for R.C.C. work in Beams For all Floor	47 65 45	5.8.2 (C) 9.1 H (I) 5.4.13	The payment shall be made for completed item on Cum. basis.

13	Providing and laying controlled cement concrete M - 200 with curing etc complete, including the cost of formwork but excluding the cost of reinforcement, for R.C.C. work in Slab for all Floor.	42 64 45	5.8.2 (C) 9.1. B (i) 5.4.13	The payment shall be made for completed item on Cum.
14	Providing and laying controlled cement concrete M.200 & curing complete including the cost of form work but excluding the cost of reinforcement for reinforced concrete work in Chajja for all Floor.	476645	5.8.2(C)9.1(L) 5.4.13	The payment shall be made for completed item on Cum. Basis for All floor.
15	Providing and laying controlled cement concrete M.200 & curing complete including the cost of form work but excluding the cost of reinforcement for reinforced concrete work in Stair case for all Floor.	41 66 45	5.8.2 E 9.1. M 5.4.13	The payment shall be made for completed item on Cum. Basis for All floor.
16	Providing and laying controlled cement concrete M200 and curing etc. complete including the cost of form work and excluding the cost of reinforcement etc. complete in RCC Vertical and Horizontal wall for All floor	47 66 45	5.8.2 K 9.1 Q 5.4.13	The payment shall be made for completed item on Cum. Basis for All floor.
17	Providing and laying controlled cement concrete M-200 for RCC work and curing complete including the cost of form work but excluding the cost of reinforced concrete work in coping on Ground Floor	38	5.3.14A	The payment shall be made for completed item on Cum. Basis
18	Providing TMT Bar FE 500D reinforcement for R.C.C. work including bending, binding and placing in position complete upto floor two level	--- As per attached sheet ---		
19	Filling available excavated earth (excluding rock) in trenches. plinth, sides of foundations etc. in layers not exceeding 20 cm. in depth consolidating each disposed layer by ramming and watering.	35	4.12	

20	Filling in foundation and plinth with murrum or selected soil in layers of 20cm. thickness including watering, ramming and consolidating etc. complete.	35	4.0.0.4	
21	Filling in foundation and plinth with sand in layers of 20 cm. Thickness including watering ramming and consolidating etc. comp.	35	4.24	
22	Filling in foundation and plinth with brick Bats in layers of 20cm. thickness including watering, remming and consolidating etc. complete	36	4.0.0.5	
23	Providing and filling with good quality sinder (steam coal) as directed by engineer in charge in sunks in layers of 15 cm thk, including watering, placing, ramming well etc. as directed for all floor	--- As per attached sheet ---		
24	Carring out plinth treatment to post construction / existing structure by spraying chemical solution for termite control treatment including labour and material consistment with I.S.I specification. Using Chlordene and Chiorpurfiles 20 EC. As Per 6131_paret-II Consentrarion Weight one percent is recommended i.e one litre 20 EC chemical emulsion with 19 liter give 1 % concentration inclusive of one litre chemical emulsion appication at the rate of 5 Litre chemical / Sqm of surface is recommended as per I.S	157	22.00.9	
25	Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:5. (1- Cement : 5 -fine sand) (B) Conventional	51	6.12.B	
26	Brickwork using common burnt Clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in superstructure above plinth level upto floor two level (B) Conventional 1:5. (1- Cement : 5 -fine sand) For All floor	53 54	6.19.B 6.20	

27	Half brick masonry in common burnt clay building bricks having crushing strength not less than 35 Kg/Sq.Cm. in Cement mortar 1:5 (1- Cement : 5 -coarse sand) in superstructure above floor two level.(B) Conventional For All floor	54 56	6.30.II.A 6.33.B	
28	Steel work, welded in built up sections framed work including cutting, hoisting, fixing in position and applying a priming coat of red lead paint. In beams and joists, channels angles Tees, flats, with connecting plates or angle cleats as in main and cross beams. Hip and jack rafters, purlins conneted to common rafters and the like	80	11.4.A	
29	Providing and fixing of Ridge flashing for roof panel shall be made out of 0.5 mm thick pre coated GI sheet . The Precoated sheet shall be of minimum 240 mpa steel grade confirming to IS 14246:1995 and shall have zinc coating of minimum 120 gsm as per IS:277:1992 , 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 micron. The PPGI Sheet shall have plastic protective guard film of minimum 25 microns to avoid scratches during transportation. The ridge shall be fixed to the steel members by pop rivet or self drilling/self stitching fastners @ maximum 450 mm c/c along length of capping/flashing etc complete .	--- As per attached sheet ---		
30	Providing and fixing 38mm Single/double shutter flush door solid core (MD, ,D,D1)laminated both side of 1 mm thickness pattern and design is to be approved by the Architect, with Stainless Steel handle size 30 Cm Long, Tower Bolt size 15cm, & Heavy Stainless steel Aldrop as per attached detail architectural drawing	--- As per attached sheet ---		

31	Providing and fixing FRP frame size 125x65 mm and 35mm thick FRP shutter having extra reinforcement on sides & edges in polish finish. The core of the shutter & frame is to be filled up with injected polyurethane foam done in situ alongwith embedded wooden pieces for stiffening & also taking hinges & fixtures. The whole FRP frame & shutter is to be water proof weather proof, termite proof & resistance to mild acid/alkali. Rates are to be inclusive of S.S hinges with necessary screws & alluminium S.S fixtures & fastenings & fastener sleeve.	--- As per attached sheet ---
32	Providing and fixing FOUR track sliding window (3 Glass shutters & 1 Mosquito net shutter) using standard extruded color anodized aluminum section equivalent to Jindal series E (30mm) section numbers: frame bottom with weep holes - 21198, frame top & sides 21204, shutter top & Bottom - 20993, Shutter interlock - 20550, Shutter side (Handle) - 20553 with 5mm thick transparent tinted float glass, with EPDM rubber gasket, air lock strip and finishing joints with transparent silicon sealant, with alluminium powder coated fittings and fixtures.	--- As per attached sheet ---
33	Providing and fixing THREE track sliding window (2 Glass shutters & 1 Mosquito net shutter) using standard extruded color anodized aluminum section equivalent to Jindal series E (30mm) section numbers: frame bottom with weep holes - 20928, frame top & sides 20837, shutter top & Bottom - 20993, Shutter interlock - 20550, Shutter side (Handle) - 20549 with 5mm thick transparent tinted float glass, with EPDM rubber gasket, air lock strip and finishing joints with transparent silicon sealant, with alluminium powder coated fittings and fixtures.	--- As per attached sheet ---

34	Providing and fixing standard extruded of aluminium section of size 63mm x 38.10mm x 1.2mm (of Jindal section No. 2434, @ Wt. 0.643 Kg per mt) with colour anodized aluminium frame for ventilation with 5 mm thick frosted glass as details etc. complete.	--- As per attached sheet ---		
35	Providing and fixing window having extruded aluminum Colour anodized section frame main outer size 63.50 x 38.10 x 1.95 mm, @ Wt 1.094 Kg / Rmt, horizontal two track member size 61.85 mm x 31.75 mm x 1.20mm @ wt.of 0.695 Kg/mt, vertical member of size 61.85 mm x 31.75mm x 1.30 mm @ wt.of 0.659 Kg/mt with sliding shutters of horizontal member size 40mm x 18mm x 1.29mm @ wt.of 0.456Kg/mt, vertical member of size 40mm x 18mm x 1.29mm @ wt.of 0.456Kg/mt, @ Wt. 0.457 Kg/mt with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminum fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc complete for window.	--- As per attached sheet ---		
36	Providing and fixing in position collapsible steel shutters with vertical channels 20 x 10 x 2mm braced with flat iron diagonals 20x5mm size with top and bottom rails of T-Iron 40 x 40 x 6mm with 38 mm dia steel pullets complete with bolts, nuts, locking arrangement, stoppers handles including applying a priming coat of red lead paint	81	11.6	
37	Providing and fixing M.S.Grills of required pattern with M.S.Flats at required spacings and frame around, square or round bar, with round headed bolts and nuts or by screws plain grill including approval quality of primer and two coat of oil painting etc.	75 139 138	10.100.A 19.12 19.7	
38	Providing and laying 24" X 24" Vitrified 8 mm thick tile flooring over 20 mm {average} base of cement mortar 1:6 { 1 cement : 6 coarse sand } on new surface or fixing on existing flooring by adhesive materials including dismantling of existing flooring and jointed with colour cement slurry including finished with flush pointing & cleaning the surface etc. complete for LIGHT shade	98	14.43	The work shall be carried out Vitrified tiles of size 24" X 24" i/o Kota Stone.

39	Providing and laying Vitrified tiles 8 to 10 mm thick , in skirting risers of steps and dedo on 10mm thick cement plaster 1:3 (1-cement : 3-coarse sand) and jointed with white cement slurry	97	14.32	The work shall be carried out Vitrified tiles 8 to 10 mm i/o 6mm thick glazed tiles.
40	Providing and laying Kota stone slab flooring over 20 mm. (average thick base of cement mortar 1:6 (1 cement : 6 coarse sand) of L.M. 1:1.5 and laid over and jointed with grey cement slurry including rubbing and polishing complete.(A) 25 mm thick	99	14.43.B	
41	Providing and laying Ceramic tiles 6mm thick in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3-coarse sand) finishing with flush pointing in white cement.	96	14.29	The work shall be carried out with Ceramic Tiles 6 mm thick
42	Providing and laying coloured glazed tiles of the size 300 mm x 200 mm x 8 mm / 300 mm x 450 mm x 8 mm in skirting, risers of steps and dedo on 10 mm. thick cement plaster 1:3 (1 cement : 3 coarse sand) & jointed with white cement slurry.	97	14.32	The work shall be carried out with 300 X 200 X 8mm / 300 X 450 X 8mm Coloured Glazed Tiles
43	Providing and fixing 18mm thick Granite in Stair steps threds and risers over 10mm (Average) thick base of cement mortar 1:3 (1-cement : 3-coarse sand) laid over and jointed with grey cement slurry including rubbing and polishing etc. complete selected as per attached detail architectural drawing	97	14.36.A	The work shall be carried out with 18 mm thick granite in single piece as per the width of stairs including rounding the edges with bed of 10 mm thick in CM 1:3.

44	Providing and Fixing Sandwich type standing platform in kitchen using 18mm thick Black GRANITE in top and sides and 25 to 30 mm thick one side polished Kota Stone in base including 0.60 mt. wide vertical support of both side polished polished Kota Stone and one horizontal shelf 60 cm wide below platform as required and including 50mm wide facia patti in front incl. moulding the exposed edges in half round with all material, tools and labour etc. complete as directed by Engineer-In-Charge.	--- As per attached sheet ---		
45	Providing & laying 20mm thick Kotah stone Shelf Doble side polishing with making the grooves in the walls and fixing the kotah stone Shelf finishing the same with cement mortar 1:2 etc. complete as directed by Engineer-In-Charge.	99	14.44	(The work shall be carried out for Double side Polished Kotah Stone)
46	Providing and laying polished Granite stone slab 18 mm (Average) thick for For Doors / WIndows cill & Jams Clading as per design incl. half round edge in laid on 10 mm thick cement mortar 1:3 (1 -cement : 3 coarse sand) jointed with grey cement slurry including rubbing and polishing etc. complete as directed by Engineer-In-Charge.	97	14.36.A	The work shall be carried out with 18 mm thick granite in single piece as per the width of jams/sills including rounding the edges with bed of 10 mm thick in CM 1:3.
47	Providing and fixing pre-cast Rubber Dye inter locking concrete block 60mm thick with grade of concrete M200 pneumatic compressed by mechanically pressed and as per approved design including 75mm sand layer for levelling and filling the joint with sand in proper line and level	--- As per attached sheet ---		
48	Providing and fixing pre-cast concrete kerb stone of gray cement based concrete block 30cm length, 30cm height and 15cm thick of M250 grade concret as per approved design and including excavation for fixing in proper line and level,filling the joint with C:M 1:3 (1cement:3fine sand) etc complete as directed by Engineer-In-Charge.	--- As per attached sheet ---		

49	Providing and laying broken china mosaic flooring for terrace using 12 mm to 20 mm broken pieces of glazed tiles to be laid over cement mortar 1:3 to plain or slope and to be tempered to bring mortar crème out upto surface using white cement including rounding of junctions and extending them upto 15 cm along the wall, clearing with water and oxalic acid etc. as directed on 50 mm thick CC 1:2:4 concrete flooring.	--- As per attached sheet ---		
50	Providing and cement vata (10cm x 10cm size) quarter round in cement mortar 1:1 including neat cement finishing watering etc. complete.	124	17.0.0.1	
51	Providing and fixing chicken mesh jali with square of 12.50 x 12.50 mm of 25 gauge at junction the Brick.masonry and reinforcement cement concrete member, work done before plastering work including scaffolding etc complete.	--- As per attached sheet ---		
52	Providing and making 10 mm Groove in plaster in perfect line and level & plumb including the cost of scaffolding etc complete as directed by Engineer-In-Charge.	--- As per attached sheet ---		
53	Providing 15mm thick cement plaster on Rough (Similar) side of single or half brick walls for interior plastering upto floor two level and finished even and smooth in (i) Cement mortar 1:3 (1-cement:3-sand) For All Floor	119 121	17.58 I 17.91.	The work shall be carried out for 15mm thick insted of 10mm thick.
54	Providing 10mm thick cement plaster on brick/concrete walls for interior plastering upto floor two level and finished even and smooth in (i) Cement mortar 1:3 (1-cement:3-sand) For All Floor	119 121	17.58. I 17.91.	
55	20mm thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12mm thick backing coat of C.M. 1:3 (1-cement : 3-sand) and 8mm thick finishing coat of C.M. 1:1 (1-cement : 1-sand) etc. complete.	122	17.95	The work shall be carried out for all height above G. L.

56	Applying priming coat over new steel and other metal surface after and including preparing the surface by thoroughly cleaning, oil, grease, dirt and other foreign matter and scoured with brushes fine steel wood, scrapers and sand paper with ready mixed priming paint brushing red lead.	139	19.11	
57	Painting two coats (excluding priming coat) on new steel and other metal surface with enamel paint, brushing, interior to give an even shade including cleaning the surface an even shade including cleaning the surface of all dirt, dust and other foreign matter.	138	19.7	
58	Applying two coats of putty & one coats of primer of approved brand and manufacture on new wall surface to give an even shade including thoroughly brushing the surface free from mortar dropping and other foreign matter and sand papered smooth	136	18.57	Two coat of Birla or asian acrylic lappy & Two Coat of Primer
59	Wall painting three coats with plastic emulsion paint of approved brand and manufacture on wall surfaces to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth	136 137	18.57 18.59.	
60	Distempering (two coats) with oil bound distemper of approved brand and manufacture and of required shade on undecorated wall surfaces to give an even shade, over and including a priming coat with distemper primer of approved brand and manufacture after thoroughly brushing the surface free from mortar droppings and other foreign matter and also including preparing the surface even and sand papered smooth.	132	18.44	
61	Finishing wall with weather proof exterior emulsion paint on wall surface (two coats) to give an required shape even shade after thoroughly brushing the surface to remove all dirt, and remains of loose powdered materials.etc complete	135	18.51	Weather proof exterior acrylic emulsion paint instead of water proof cement paint

62	Providing and fixing frame work in trusses, purlin incl. cutting hoisting and fixing in position on column / strut made of hollow M.S. pipe or I.S. section steel and applying a priming coat of red lead paint incl. oil painting etc. comp.	--- As per attached sheet ---		
63	Providing laying and jointing in true line and level 160 diameter U.P.V.C. SWR Type B pipe conforming to IS 13592-1992 with one end plain and other end socketed with rubbering, & fitting conforming to ISI 14735-1999 of approved make for drainage system pipe line, pipe shall be jointed with each other with rubber lubricant, pipe shall be fixed on wall using of PVC clamp of the size 160 mm diameter x 210 mm length x 196 mm high at every 2000 mm center to center or shall be concealed in walls as directed including necessary fittings such as bends, shoes etc. including testing of pipes and joints and jointed with adhesive solvent cement including cost of all materials.	173	23.8.E	The work shall be carried out for 160mm dia U.P.V.C. SWR Type B with ISI quality.
64	Providing, laying and jointing in true line and level 110 diameter U.P.V.C (Type B) conforming to IS 13592-1992 with one end plain and other end socketed with rubber ring, & fittings conforming to ISI 14735-1999 of approved make for drainage system pipe line, pipe shall be jointed with each other with rubber lubricant, pipe shall be fixed on wall using of PVC clamp of the size 110 mm diameter x 149 mm length x 145 mm height at every 2000 mm center to center or shall be concealed in walls as directed including necessary fittings such as bends, shoes etc. including testing of pipes and joints and jointed with adhesive solvent cement including cost of all materials.	173	23.8.E	The work shall be carried out for 110 mm dia U.P.V.C. SWR Type B with ISI quality.
65	Providing laying and jointing in true line and level 50mm dia. U.P.V.C. Pipe (SCH- 40) for cold water including fittings as approved by Engineer In Charge. Pipe shall be fixed on the wall with the help of clamp at every two metre C/C or shall be concealed as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.	173	23.8.E	The work shall be carried out with U.P.V.C pipe with SCH-40 .

66	Providing laying and jointing in true line and level 40mm dia. U.P.V.C. Pipe (SCH- 40) for cold water including fittings as approved by Engineer In Charge. Pipe shall be fixed on the wall with the help of clamp at every two metre C/C or shall be concealed as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.	173	23.8.D	The work shall be carried out with U.P.V.C pipe with SCH-40.
67	Providing laying and jointing in true line and level 25mm dia. U.P.V.C. Pipe (SCH- 40) for cold water including fittings as approved by Engineer In Charge. Pipe shall be fixed on the wall with the help of clamp at every two metre C/C or shall be concealed as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.	173	23.8.B	The work shall be carried out with U.P.V.C pipe with SCH-40.
68	Providing laying and jointing in true line and level 15mm dia. U.P.V.C. Pipe (SCH- 40) for cold water including fittings as approved by Engineer In Charge. Pipe shall be fixed on the wall with the help of clamp at every two metre C/C or shall be concealed as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.	173	23.8.A	The work shall be carried out with U PVC pipe with SCH-40 .
69	Providing and fixing to wall ceiling and floor 10.0 Kg. F/Cm ² working pressure poluthene pipes of the following outside Dia. Low densidy, complete with special falnge compression type fittings, wall clipsetc. including making good the wall ceiling and floor.(G)110 mm	173	23.8.E	The work shall be carried out for 100 mm dia P.V.C. 10.00 Kg/Sqm with ISI quality.
70	Providing and fixing to wall ceiling and floor 10.0 Kg. F/Cm ² working pressure polythene pipes of the following outside Dia. Low densidy, complete with special falnge compression type fittings, wall clipsetc. including making good the wall ceiling and floor.(F) 75mm	173	23.8.E	The work shall be carried out for 75 mm dia P.V.C. 10.00 Kg/Sqm with ISI quality.

71	Providing and fixing concealed center point to wall ceiling & floor CPVC (SDR 13.5) PIPE having National Sanitation Foundation (NSF) seal for potable water of following dia. nominal bore tube fittings and clamps including making good the wall, ceiling and floor etc. complete.[A] 15 mm.	173	23.8.A	The work shall be carried out for CPVC (SDR 13.5) pipe with heavy type fittings instead of PVC pipe.
72	Providing and fixing concealed center point to wall ceiling & floor CPVC (SDR 13.5) PIPE having National Sanitation Foundation (NSF) seal for potable water of following dia. nominal bore tube fittings and clamps including making good the wall, ceiling and floor etc. complete.[C] 25 mm.	173	23.8.B	The work shall be carried out for CPVC (SDR 13.5) pipe with heavy type fittings instead of PVC pipe.
73	Providing and fixing screw down bib tap of brass chromium plated screw down bib tap 15 mm dia.	170	23.92-B	The work shall be carried out with Screw Tap instead of Bib Tap
74	Providing and fixing brass screw down stop tap.15 mm dia.	170	23.92-B	The work shall be carried out with Stop tap instead of Bib Tap
75	Providing and fixing chromium plated brass half turn flush cock of approved quality including fixing in pipe line etc complete.(ii) 25 mm dia.	171	23.00.(II)	
76	Providing and fixing gun metal check or non return full way wheel valve. 40 mm dia.	171	23.99.E	
77	Providing and fixing gun metal check or non return full way wheel valve. 25 mm dia.	171	23.99.C	
78	Providing and fixing wash basin with single hole for pillar tap with C.I. or M.S. brackets painted white including cutting holes and making good the same but excluding fittings.(A) Vitreous China (ii) Flat back wash basin 550 mm x 400 mm size (in White colour) Including fixing C.P. brass waste for sink. And fixing M.I. fisher union for sink. (A) 32mm dia.	167 168 168 172 172	23.127 23.135 (B) 23.136 (A) 23.134 23.96	

79	Providing and fixing 600 mm x 450 mm bevelled edge mirror of superior glass mounted on 6 mm thick A.C.sheet or plywood sheet and fixing to wooden plugs with C.P.screws and washers.	169	23.143	
80	Providing and fixing C.P.Brass towel rail complete with C.P.Brass brackets fixed to woodenplugs with c.p.brass screws.(B) 600 mm x 20 mm size.	169	23.144(B)	
81	Providing and fixing water closet Squatting pan (Indian type W.C. pan) size 580 mm (earthwork, bed concrete, foot rests and 100 mm P or S trap & including G.I inlet connection etc comp. (A) Vitreous china - (i) Long pattern-white colour.	163 165 167	23.111 23.113 23.120	
82	Providing and fixing wsh down water closet (European type, W.C. Pan) with integral P or S trap including jointing the trap with soil pipe in Cement Mortar 1:1 (1-Cement : 1-fine sand) (Seal and cover to be measured and paid for separately)(A) vitreous China Pattern :(i) in white colour	165 171	23.112 (A)(I) 23.96	
83	Providing and fixing PVC SWR Nahni TrapIS 14735 for drain - 100 mm diameter with jali of the following nomonal diameter oself cleansing design with C.I. sread down or hinged grating including the cost of cutting and making good the walls.	164	23.87	PVC SWR 100 mm Nahni trap insteadof Cast iron (Spun) Nahni trap.
84	Providing and fixing PVC SWR Nahni trap IS 14735 for drain - 75 mm diameter with jali of the following nominal diameter of self cleansing design with C.I sread down or hinged grating including the cost of cutting and making good the walls.q	164	23.87	PVC SWR 75 mm Nahni trap insteadof Cast iron (Spun) Nahni trap.
85	Providing and fixing S.W.gully trap with C.I.grating brick masonary chamber and water tight C.I.cover with frame of 300mm x 300 mm size (inside) with standard weight (i) square mouth traps (A) 100 mm x 100 mm size P type.	176	24.19(1)	

86	Constructing brick masonry chamber for under ground C.I.inspection chamber and bends with bricks having crushing strength not less than 35 kg/sq.cm in C.M.1:5 C.I.cover with frame (light duty) 455 mm x 610 mm internal dimension total weight of cover with frame to be not less than 38 kgs.(weight of cover 23 kg and wt.of frame 15 kg)R.C.C.top slab with 1:2:4 mix (1 cement:2 coarse sand:4 graded stone aggregates 20 mm size) foundation concrete 1:5:10 inside plaster 15 mm thick cement mortar 1:3 finished smooth with a floating coat of neat cement on wall and bed concrete etc complete.(I) Inside dimensions 455 mm x 610 mm and 450 mm deep for single pipe line.	183	24.44/1	
87	Providing erecting and fixing double coated Syntex or equivalent PVC. (ISI) mark water tank of reqd capacity each with all necessary fittings & connection etc. comp on terrace.	--- As per attached sheet ---		
88	Providing and fixing ball cock of approved quality as directed.(A) Copper metal (i) 25 mm dia.	172	23.00.5.A	
89	Providing & fixing acrylic name plate of required size on Room with Lettering etc. complete including all labour and material etc complete.	--- As per attached sheet ---		
90	Providing 100 cms high and 10 cms thick CC M-20 Hand rail with 50 mm dia round hollow S S pipe with 30 mm SS pipe of height 20 cm supports embeded in concrete etc. complete.	--- As per attached sheet ---		
91	Providing 30 cms high and 10 cms thick CC M-20 & Hand rail with 50 mm dia round hollow & S S pipe with 30 mm SS pipe supports of Height 90 cm embeded in concrete etc. complete.	--- As per attached sheet ---		
92	Providing and Fixing Stainless Steel letters 15 inch high as directed by Engineer in charge.	--- As per attached sheet ---		
93	Providing and fixing Kitchen sink with C.I. or M.S. brackets, painted white including cutting holes in walls and making good the same Including fittings. (C) Vitreous China Sink.(i) 600mm x 450mm x 150mm size Including fixing C.P. brass waste for sink. And fixing M.I. fisher union for sink. (B) 40mm dia.	167 168 168 172 172	23.127 23.135 (B) 23.136 (A) 23.134 23.96	

94	Providing and fixing in position cowl went to pipes.(B) 75mm dia.	163	23.79	(The work shall be carried in PVC Cowl 75mm as directed.)
95	Providing and fixing in position cowl went to pipes.(C) 100mm dia	163	23.79	(The work shall be carried in PVC Cowl 100mm as directed.)
96	Providing and Fixing Stainless Steel(Grade-316) accessories, Sheet Cutlery Basket of size:520X485X100 mm .fixing on telescopic channel of length 500mm having hardware like handles, dead lock etc. for Kitchen of Approved Brand as directed by Engineer in charge.	--- As per attached sheet ---		
97	Providing and Fixing Stainless Steel (Grade-316)accessories, Thali Basket of size:520X485X350 mm .fixing on telescopic channel of length 500mm having hardware like handles, dead lock etc. for Kitchen of Approved Brand as directed by Engineer in charge.	--- As per attached sheet ---		
98	Providing and Fixing Stainless Steel(Grade-316) accessories, Plain Basket of size:520X485X150 mm .fixing on telescopic channel of length 500mm having hardware like handles, dead lock etc. for Kitchen of Approved Brand as directed by Engineer in charge.	--- As per attached sheet ---		
99	Providing and Fixing Stainless Steel(Grade-316) accessories, Cup Saucer Basket of size:520X485X100 mm .fixing on telescopic channel of length 500mm having hardware like handles, dead lock etc. for Kitchen of Approved Brand as directed by Engineer in charge.	--- As per attached sheet ---		

100	Providing and fixing Wardrobe/Kitchen Paltform type cup-board using frame of country wood @ 7 x2.5 cm thick around and comercial 19 mm ply Used For Drawer Shutter with Out side lamination of sunmica 1 mm & Inner Portion 0.8 mm with ISI make 300 mm (Ht) handle , Hinges & Magnetic ball catch Europa make Dead Lock for door , 6" ht tower bolt to another shutter and other fixture as fitting directed etc. complete.	--- As per attached sheet ---		
101	Box cutting the road surface to proper slope and camber for making a base for road work including removing the excavated stuff and depositing on the road side slope as directed upto all lead.	--- As per attached sheet ---		
102	Providing and laying compacted W.B.M. 150mm thick of grade-II in two layers each of 75mm thick of machine crushed BT metal of size 40mm to 63mm with using 13% stone screenings of 13.2mm size and 7% stone dust as filler including spreading watering and consolidation by vibratory roller etc. comp. in single layers	--- As per attached sheet ---		
103	Providing and laying compacted WBM 100 mm thick of grading I , B.T.M.C.metal of size of size 45 to 90 mm in required layers including using 20% stone screening 13.20 mm size and 7% stone dust as filler including spreading watering and consolidation by vibratory roller etc complete.	--- As per attached sheet ---		
104	Providing and laying cement concrete 1:3:6 (1 Cement : 3 course sand : 6 Crushed stone agg.of 20 mm nominal size) and curing complete excluding cost of form work in (a) Foundation and plinth.	38	5.3.2.A	The work shall be carried out with Crushed stone agg. of 20mm nominal size
105	Providing and laying Controlled Cement Concrete M - 250 for average 200mm thick wearing coat laid as directed including Trimix finishing ,curing complete	--- As per attached sheet ---		

106	<p>Road marking with hot applied thermoplastic paints with reflectorising glass beads on bitumin surface providing and laying a hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250gms per sqm area, thickness of 2.5mm is excluding of surface applied glass beds as per IRC:35-2015. The finished surface to be level, uniform and free from streaks and holes. zebra patta /bump patta lane/center line/ edge line/cut patta. The white color marking should provide liminance coefficinet on cemend road shalll be min 130 mcd/m2/lux and Asphalt road shall be min 100 mcd/m2/lux during the service life during the day time. The marking should meet the performance criteria for night time reflectivity, wet reflectivity and skid resistance as mentioned in the section-15 of IRC 35-2015. Warranty for the Retro reflectivity should be two years.</p>	--- As per attached sheet ---		
107	<p>Constructing brick masonry chamber for underground C.I. Inspection chamber and bends with briocks having croshing strength not less than 35Kg. Cm2 in C.M. 1:5 precast RCC cover 455mm x 610mm intenal dimensions with frame (R.C.C. top slabe with 1:2:4 mix (1-cement :2- coarse sand :4-graded stone aggregate 20mm size) foundation concrete 1:5:10 inside plaster 15mm thick with cement mortar 1:3 finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete (i) Inside dimensions 455mmx 610mm and 450mm deep for single pipe line.</p>	183	24.44/1	The work shall be carried out Precast RCC Cover i/o C.I. Cover

108	Constructing brick masonry chamber for underground C.I. Inspection chamber and bends with bricks having crushing strength not less than 35Kg. Cm ² in C.M. 1:5 precast RCC cover 500mmx 700mm internal dimensions with frame (R.C.C. top slab with 1:2:4 mix (1-cement :2- coarse sand :4-graded stone aggregate 20mm size) foundation concrete 1:5:10 inside plaster 15mm thick with cement mortar 1:3 finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete (i) Inside dimensions 500mmx 700mm and 450mm deep for single pipe line.	184	24.44/II	The work shall be carried out Precast RCC Cover i/o C.I. Cover
109	Constructing brick masonry chamber for underground C.I. Inspection chamber and bends with bricks having crushing strength not less than 35Kg. Cm ² in C.M. 1:5 C.I. cover with frame (Light duty) 455mm x 610mm internal dimensions, total weight of cover with frame to be not less than 38Kg. (Wt. of cover 23 Kg.) and Wt. of frame 15Kg.) (R.C.C. top slab with 1:2:4 mix (1-cement :2- coarse sand :4-graded stone aggregate 20mm size) foundation concrete 1:5:10 inside plaster 15mm thick with cement mortar 1:3 finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete.(iii) Inside dimensions 600mm x 850 mm and 450mm deep for pipe lines with three or more inlets.	184	24.44.(III)	
110	Providing and fixing C.I. Manhole cover 0.60 M. x 0.45M. Size having weight not less than 35Kg.	173	23.00.6	
111	Providing and fixing cast iron steps of size 500mm x 150mm x 22.5mm and painting with two coats of Anti-corrosive paint etc. complete.	--- As per attached sheet ---		

112	Providing and fixing decorative entrance gate made out of cast iron and various mild steel tabular section combination , the Ornamental entrance gate should be fixed at compound wall including pattern and die making , cutting , welding , grinding, fabrication , fixing in position at compound wall with necessary pedestal, bearing block and other locking arrangement. The entrance gate should be painted with two coats of priming coat of paint, and two coat of oil paint etc complete. As per detail design and instruction of architect.	--- As per attached sheet ---		
113	Providing and Constructing JUNCTION CHAMBER of size 0.35 x 0.35 x 0.60 m. including connecting rainwater pipes, Half brick work with 15mm thick plaster in C;M 1:4, 50mm thick C.C. 1:2:4 in bed flooring & covered with FRP Framewith cover incl. all labour, material , excavation etc. complete.	--- As per attached sheet ---		
114	Providing & Constructing FILTER CHAMBER of size 2.06 x 1.21 x 1.20 m. including connecting rainwater pipes, half brick work with 15mm thick plaster in C;M 1:4, 50mm thick C.C. 1:2:4 in bed flooring & covered with Precast RCC slab cover 100mm thick incl. all labour, material , excavation etc. complete.	183 185	24.44 (i) 24.46	The Size of chamber Shall be 2.06 x 1.21 outside dimmension & 1.20 mt. Depth, The Payment Shall be Per No. Basis.
115	Providing & Constructing PERCOLATION SOCKWELL of 2.54 minternal clear diameter and 5.00 mt. depth incl. honey comb brick masonry in C:M 1:C, 15mm thick plaster in C;M 1:4, 50mm thick C.C. 1:2:4 in bed flooring & covered with RCC top slab 100mm thick incl. filling with greval etc. complete incl. all labour, material , excavation etc. complete.	--- As per attached sheet ---		
116	Drilling of 200 mm dia bore hole by DTH rig in rocky formation in All takuka of Zone III (o to 350 Mtr)	--- As per attached sheet ---		

117	Supply of "U" PVC Casing pipe CM type (B) 200 mm dia	173	23.8.E	The work shall be carried out for 200mm dia U.P.V.C. SWR Type B with ISI quality.
118	Drilling of 200 / 215 mm dia bore in over burden rocky or loose collapsible / boulder strata and lowering of UPVC / PVC / ERW casing pipe above 12 mt and upto 40 mt depth by DTH rig etc complete	--- As per attached sheet ---		
119	Providing and fixing bail plug {Bottom Cap } Suitable for 200mm dia. Pipe	--- As per attached sheet ---		
120	Heavy duty clamp made from 4" x 1.5" iron strip suitable for column pipe 1.5" to 2" length. (C) 65mm(2.1/2") dia. Pipe	--- As per attached sheet ---		
121	Supplying & erecting G.I. bend for pipe connections suitable for (E) 65 mm(2.5")	--- As per attached sheet ---		
122	Supplying, & erecting C.I. swing, check type non-return (Reflux) Valve -ISI marked suitable for following size (B) 65 mm dia.	--- As per attached sheet ---		
123	Providing & Supplying of ISI marked HDPE Pip suitable for potable water as per IS specifications no 4984/1995 including all taxes, transportation, freight charges, inspection charges, loading, unloading along with lowering and laying the pipe including the cost of all labour & material for 63mm dia 10.00 kg/cm ² pipe.	--- As per attached sheet ---		
124	Geohydrological ground water investigation including vehicle charges (b) For three phase DTH bore / DR tube well including water sample testing charges.	--- As per attached sheet ---		

125	Trenching in ordinary / Hard soil up to a depth of 60 cm including removal and stacking of serviceable materials and then disposing of surplus soil, by spreading and neatly levelling within a lead of 50 m and making up the trenched area to proper levels by filling with earth or earth mixed with sludge or / and manure before and after flooding trench with water (including cost of imported earth, sludge or manure).	--- As per attached sheet ---
126	Providing and fixing M. S. tree guard 50 cm square in plan, height 1.40 metre above ground level and 0.50 metre below ground level. The vertical members shall consist of four nos of angle iron of size 20x20x4 mm 1.9 long, one at each corner and 8 nos flat iron of size 25x4 mm 1.4 long. The vertical members shall be welded to 4 nos 25x4 mm M. S. flats placed horizontally around the vertical member of the cage. One name plate of 1 mm thick M.S. sheet of size 250x100 mm shall be welded to the tree guard near the middle height and lettered CPWD / PWD/ any other approved name. The tree guard shall be fixed to the ground by making suitable holes and by embedding four corners leg in the ground, including refilling the earth , compaction etc. complete. The tree guard shall be painted with two coats of paint of approved brand and manufacture over a coat of primer, complete in all respect.	--- As per attached sheet ---
127	Supplying, Providing & Fixing of Precast benches of Cement concrete, top covered with a layer of Latest Mosaic chippings/ tiling shade as directed by Engineer -in- Charge with specified " Name plate" casted with, at the time of the manufacture of benches, as directed, cured, rubbed and polished properly, Transporting at site and fixing the bench on two leg padastal of Precast C.C. with necessary, excavation, PCC, Fixing padastals & Fixing precast benches in line and levels with jointing material etc. comple	--- As per attached sheet ---

128	Clearing and grubbing road land including uprooting rank vegetation grass bushes, shrubs, sapling and trees girth up to 300 mm removal of stumps of trees cut earlier and disposal of unserviceable materials (C) By mechanical means in area of light jungle	10	1.C.	Road works booklet
129	Rolling & Watering of earthwork in layers with power roller including filling in depressions which occur during the process. As directed	21	6.A.	Road works booklet

Deputy Executive Engineer
Dist. R & B Sub-Division
Jetpur

Executive Engineer
Dist R & B Division
Rajkot

Name of work :- Construction of Revenue Staff Quarters (C type - 4 unit, B type - 4 unit, D type - 1 unit) at Jetpur ,Dist Rajkot.

SPECIFICATION

Item No. 18

Providing TMT Bar FE 500D reinforcement for R.C.C. work including bending, binding and placing in position complete for all floor.

The work includes providing and laying in position Thermo Mechanically treated FE 500D bars of the following grade.

Grade Designation	Bar type confirming to Governing IS Specification.	Characteristics strength by Mpa	Elastic modulus Gpa
S 500	IS 1786 High yield strength deformed bar	500	200
S 240	Is 432 Part II	240	

TMT BARS FE 500D

FE 500D. bar shall conform to min 500 MPa yield strength. Tensile Strength of min 500 MPa and elongation percentage min 22. The Chemical composition of bars shall be below.

	% Max.
Carbon	0.25
Sulphur	0.05
Phosphorus	0.05
Sulphur & Phosphorus	0.01

All steel shall be procured from original producers, no re-rolled steel shall be incorporated in the work. Only new steel bars shall delivered to the site. Every bar shall be inspected before assembling in the work and defective brittle or burnt bar shall be discarded cracked ends of bars shall be discarded.

1. The work shall consist of furnishing and placing reinforcement of the shape and dimensions shown on the drawings or as directed by the Engineer-in-charge.
2. Steel shall be clean and free from loose rust and loose mill scale at the time of having in position and subsequent concreting.
3. Reinforcing steel conform accurately to the dimensions given in the Bar bender Schedules shown on relevant drawing. Bars shall be bent cold to the specified shape and dimensions or as directed by the Engineer in charge using a proper bar bender, operated by hand or power to attain proper radius of bends.
4. Bars shall not be bent or straightened in a manner that will injure the material. Bars bent during transport or handling shall be straightened before being used on work; they shall be not heated to facilitate bending. Unless otherwise specified a “U” type hook at the end of each bar shall be invariably provided. The radius of the bend shall not be less than twice the diameter of the round bar and the length of the straight part of the bar beyond the end of the curve shall be at least four times the diameter of the found bar. In the cases of bars which are not round and in the case of bars which are not round and in the case of deformed bars. Ten diameter shall be taken as the diameter of circle having an equivalent effective are. The hooks shall be suitably encased to prevent and splitting of the concrete.
5. All reinforcement bars shall be accurately placed in exact position shown on the drawings, and shall be securely held in position during placing of concrete by annealed binding wire not less that 1 mm. in size and conforming to I.S. : 2180 and by using stay block or metal chairs, spacers, metal hangers supporting wires or other approved device at sufficiently close intervals. Bars will not be allowed to sag between supports nor displaced during concerting or nay other operation of the work. All devices used for positioning shall be on non corrodible material wooden and metal

supports will not extend to the surface of concrete, except where shown on the drawing. Placing bars on layers of freshly laid concrete as the work progresses for adjusting bar spacing will not be allowed. Pieces of broken stone or brick and wooden blocks shall not be used. Layers of bars shall be separated by spacer bars, precast mortar blocks or other approved devices. Reinforcement after being placed in position shall be maintained in a clean condition until completely embedded in concrete. Special care shall be exercised to prevent displacement of reinforcement in concrete already placed. To protect reinforcement from corrosion, concrete cover shall be provided as indicated on the drawings. All bars protruding from concrete and to which other bars are to be spliced and which are likely to be exposed for an indefinite period shall be protected by a thick coat of neat cement grout.

6. Bars crossing each other, where required, shall be secured by binding wire (annealed) of size not less than 1 mm. and conforming to IS : 28, in such a manner that they do not slip over each other at the time of fixing and concreting.

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

8. Whenever indicated on the drawing or desired by the Engineer-in-charge. Bar shall be jointed by couplings which shall have a cross section sufficient to transmit the full stress of bar. The ends of the bars that are jointed by coupling shall be upset for a sufficient length so that the effective cross section at the base of threads is not less than the normal cross section of the bar. Threads shall be standard Whitworth threads. Steel for coupling shall conform to I.S. : 226.

9. When permitted or specified on the drawing, joints of reinforcement bars shall be butt welded so as to transmit their full stresses. Welded joints shall preferably be located at points where steel is not subject to more than, at any one section not more than 20 percent of the folds are welded. Only electric arc welding using a process which excludes air from the molten metal and conforms to any or all other special provision for the work will be accepted. Suitable means shall be provided to bending the bars securely in position during welding. It must be ensured that no voids are left in welding and when welding is done in 2 or 3 stages, previous surface shall be cleaned properly. Ends of the bars shall be cleaned of all loose scale, rust, grease, paint and other foreign matter before welding shall conform to I.S. : 814. Welded pieces of reinforcement shall be tested. Specimen shall be taken from the actual site and their number and frequency of tests shall be as directed by the Engineer-in-charge.

10. Reinforcement shall be measured in length excluding overlaps, separately for different diameters as actually used in the work, where welding or coupling is resorted to in place of lap joints. Such joints shall be measured not payable as the equivalent length of overlaps as per design requirement. From the length so measured the weight of reinforcement shall be calculated in tones on the same basis of IS : 1732. Length shall include hooks at end wastage and an annealed steel wire for binding and lap length shall not be measured and cost of these shall be deemed to be included in the rates for reinforcement.

11. Rate for reinforcement shall include cost of steel, its carting to work site. Cutting, bending, placing and fixing in position as shown on the drawings and as directed by the Engineer-in-charge. It shall also include cost of all devices for keeping reinforcements in approved position. Cost of jointing as per approved methods and all wastage and spacer bars.

12. MODE OF MEASUREMENTS & PAYMENT

For the purpose of payment, the bar shall be measured correct up to 10 mm length and weight payable works out at the rate specified below

Sr. No	Diameter of steel	weight of steel per running meter	Sr. No	Diameter of steel	weight of steel per running meter
1	6 mm	0.22 Kg / Rmt	8	20 mm	2.47 Kg / Rmt
2	8 mm	0.39 Kg / Rmt	9	22 mm	2.98 Kg / Rmt
3	10 mm	0.62 Kg / Rmt	10	25 mm	3.85 Kg / Rmt

4	12 mm	0.89 Kg / Rmt	11	28 mm	4.83 Kg / Rmt
5	14 mm	1.21 Kg / Rmt	12	32 mm	6.31 Kg / Rmt
6	16 mm	1.58 Kg / Rmt	13	36 mm	7.99 Kg / Rmt
7	18 mm	2.00 Kg / Rmt	14	40mm	9.86 Kg / Rmt

Excess consumption over 5% will be charged at penal rate.

Reinforcement shall be measured in length including hooks, if any, separately for different diameters as actually used in work, excluding overlaps. From the length so measured, the weight of reinforcement shall be calculated in tonnes on the basis of IS: 1732. Wastage, overlaps, couplings, welded joints, spacer bars, chairs, stays, hangers and annealed steel wire or other methods for binding and placing shall not be measured and cost of these items shall be deemed to be included in the rates for reinforcement.

The contract unit rate for coated/uncoated reinforcement shall cover the cost of material, fabricating, transporting, storing, bending, placing, binding and fixing in position as shown on the drawings as per these specifications and as directed by the Engineer, including all labour, equipment, supplies, incidentals, sampling, testing and supervision.

The unit Rate for coated reinforcement shall be deemed to also include cost of all material, labour, tools and plant, royalty, transportation and expertise required to carry out the work. The rate shall also cover sampling, testing and supervision required for the work.

The rate shall be for a unit of One Kg.

Item No. 23

Providing and filling with good quality cinder (steam coal) as directed by Engineer in charge in sunks in layers of 15 cm thickness including watering, placing, ramming well etc. as directed for all floors.

General

This work shall consist of providing and filling with approved quality cinder (steam coal) in sunken portions of floors or other locations shown on the drawings or as directed by the Engineer in charge. The filling shall be carried out in layers to the required levels, shapes and slopes and shall conform to these specifications.

1.0 Materials

Cinder shall be of approved quality obtained from steam coal and shall be clean, well graded, hard, strong and durable particles free from injurious quantities of dust, clay, kankar nodules, soft or flaky particles, shale, alkali salts, organic matter, loam, mica or any other deleterious substances.

The cinder shall be obtained from approved sources and shall be got approved from the Engineer in charge prior to use. The material shall not contain more than 8 percent silt when tested by field test method. If necessary, the cinder shall be screened or washed to remove dust and unwanted materials so as to obtain clean aggregates suitable for filling work.

2.0 Cinder

2.1 Cinder is the residue obtained from the burning of steam coal in furnaces which becomes fused or partially sintered into lumps of varying sizes.

2.2 Cinder aggregates shall be well burnt furnace residue obtained from furnaces using steam coal fuel only. It shall be sound, clean and free from clay, dirt, ash or other deleterious matter.

2.3 The average grading for cinder aggregates shall be as mentioned below.

I.S. Sieve Designation Percentage Passing I.S. Sieve Designation Percentage Passing

20 mm	100	4.75 mm	70
10 mm	86	2.36 mm	32

3.0 Workmanship

3.1 The cinder to be used for filling shall be free from salts, organic matter or any foreign substances. All lumps of cinder shall be broken to the required size before use.

3.2 The sunken portion shall be filled with cinder in layers not exceeding **15 cm thickness**. Each layer shall be properly spread, watered and consolidated thoroughly by ramming with iron or wooden rammers to achieve proper compaction.

3.3 When filling reaches the required finished level, the surface shall be watered sufficiently and allowed to settle properly and then again rammed to ensure adequate consolidation.

3.4 The finished surface of the filling shall be maintained to the required shape, level and slope as intended for the floor finish or as directed by the Engineer in charge.

4.0 Mode of Measurements & Payment

4.1 All measurements shall be made in the metric system. Different items of the work shall be measured in accordance with the procedures laid down in the relevant sections read in conjunction with the general conditions of contract. The same shall not however apply in the case of lump sum contracts.

4.2 All measurements and computations, unless otherwise indicated, shall be carried nearest to the limits specified in the standard measurement rules.

4.3 In recording dimensions of work, the sequence of length, width and height or depth or thickness shall be followed.

4.4 The rate of filling with cinder shall include the cost of all labour, materials, tools and plant, watering, placing, ramming, consolidation and all incidental expenses as described herein above.

4.5 The cinder filling work shall be measured for its length, width and height, limiting dimensions to those specified on the plan or as directed by the Engineer in charge. The rate shall be for a unit of **one cubic meter**.

4.6 Payment shall be made on **cubic meter basis** for the finished and accepted work.

Item No. 29

Providing and fixing of Ridge flashing for roof panel shall be made out of 0.5 mm thick pre coated GI sheet . The Precoated sheet shall be of minimum 240 mpa steel grade confirming to IS 14246:1995 and shall have zinc coating of minimum 120 gsm as per IS:277:1992 , 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 micron. The PPGI Sheet shall have plastic protective guard film of minimum 25 microns to avoid scratches during transportation. The ridge shall be fixed to the steel members by pop rivet or self drilling/self stitching fasteners @ maximum 450 mm c/c along length of capping/flashing etc complete .

The item shall be executed as per the relevant specification of General Technical Specification for Building Works It. No.15.1 P 104 except pre coated GI Sheet 0.50mm instead of 0.80mm Corrugated GI Sheet

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

Item No. 30

Providing and fixing 38mm Single/double shutter flush door solid core (MD, ,D,D1)laminated both side of 1 mm thickness pattern and design is to be approved by the Architect, with Stainless Steel handle size 30 Cm Long, Tower Bolt size 15cm, & Heavy Stainless steel Aldrop as per attached detail architectural drawing

Materials:

The section of frame shall be as specified in the drawing and design. Plywood shall confirm to M-37 of General Technical Specification of building booklet. 35 mm. thick solid core both side decorative laminated water proof plywood for single shutter shall be of approved quality and shall be approved by the Engineer in charge.

Workmanship:

The work shall be generally carried out as per the It No. 10.30 Page No.72 and It. No.10.12 Page No.69 of General Technical Specification of building booklet. Two pair of long matt finish stainless steel Handle and S.S. aldrop shall be provided as per the drawing and as per the instruction the Engineer in charge.

Shutters:

The single/Double shutter shall be flush door of specified thickness. The shutter shall be pre laminated using laminates of brand & pattern shall be as shown in the drawing or as directed. The teak wood 35x12mm first class teakwood beddingshall be provided around shutter.

Fixtures & Fastenings:

All fixtures and fastening shall be steel finished brass hardware. Handles, mortice locks and latch,locks shall be provided as per detailed drawing. The rate shall include all kind of fixtures and fastening. The Size and number of hinges shall be as per table given in annexure-1.Thehinges, bolts, and other items with moving parts shall be properly oiled by the contractor before handing over the building

Mode of measurement :

1. The rate is inclusive of all the cost of the material and the labour required for the satisfactory completion of the entire job.
2. Width shall be measured from out of the shutter to the outside of the frame at top. The clear gap between shutter and the floor shall not be more than 5 mm.
3. The rate shall be paid per one square meter of the completed item.
4. The payment shall be made on 1 Sqm. basis of finished work.

Item No. 31

Providing and fixing FRP frame size 125x65 mm and 35mm thick FRP shutter having extra reinforcement on sides & edges in polish finish. The core of the shutter & frame is to be filed up with injected polyurethane foam done in situ along with embedded wooden pieces for stiffening & also taking hinges & fixtures. The whole FRP frame & shutter is to be water proof weather proof, termite proof & resistance to mild acid/alkali. Rates are to be inclusive of S.S hinges with necessary screws & aluminium S.S fixtures & fastenings & fastener sleeve.

The Fiber Glass Door frame size 125 x 65 mm and 35 mm thick should be made as directed by manufacture.

The FRP Depress panels Single/Double shutter having extra reinforcement on sides and edges in gel coat finish the core of shutter and frame is to be filled up with injected fire retardant grade polyurethane foam done in situ along with embedded wooden pieces for stiffening and also taking hinges and fixtures the whole FRP Frame and shutter is to be water proof, whether proof, termite proof and resistance to mild acid / alkali Rates are Page 9 of 52 to be inclusive of SS hinges with necessary screw and aluminium fixtures and fastening and fastener sleeve and directed by engineer in change with detailed drawing. .

Payment shall be made on Sqm. Basis for complete item including cost of labour, materials, fixtures and fastening, oil paint etc. for to complete. The work shall be carried out as per instruction of Engineer in charge.

Payment for whole completed item shall be made on Smt. Basis.

Item No. 32

Providing and fixing FOUR track sliding window (3 Glass shutters & 1 Mosquito net shutter) using standard extruded colour anodized aluminium section equivalent to Jindal series E (30 mm) section numbers: frame bottom with weep holes – 21198, frame top & sides – 21204, shutter top & bottom –

20993, shutter interlock – 20550, shutter side (handle) – 20553 with 5 mm thick transparent tinted float glass, with EPDM rubber gasket, air lock strip and finishing joints with transparent silicon sealant, with aluminium powder coated fittings and fixtures.

1.0 Material

1.1 Aluminium standard section:

Aluminium used in the manufacture of sliding window sections shall conform to IS designation HEA–WP of **IS:733–1975** and also designation W.V.G.–WP of **IS:1285–1975**. The sections shall be as per the specifications shown in the drawings and design. All sections shall be free from scratches, dents or any damage on the surface. All sections shall have finished lustre surface on wall sides.

1.1.1 The work includes four track sliding window (3 glass shutters + 1 mosquito net shutter) having standard extruded colour anodised aluminium sections equivalent to Jindal series E (30 mm). Section numbers shall be as follows:

- (1) Shutter top & bottom – 20993
- (2) Shutter interlock – 20550
- (3) Shutter side (handle) – 20553
- (4) Frame bottom with gutter – 21198
- (5) Frame top & side – 21204

The shutters shall be fitted with **5 mm thick transparent tinted float glass** fixed with EPDM rubber gasket, air lock strip and finishing joints with transparent silicon sealant, complete with standard extruded colour anodized aluminium coated fittings and fixtures with mosquito net shutter as directed by the Engineer in charge.

1.2 Glass:

The transparent bronze colour tinted float glass shall be of approved make having thickness of **5 mm**. The glass shall be clear and free from scratches and cracks. The glass shall be provided on the shutter panels and fixed with transparent silicon gasket.

1.3 Glazing clips:

Glazing clips shall be of approved make and suitable size for fixing the glass panel all around. They shall be free from scratches, holes or any damage on the surface and shall have finished lustre surface on all sides.

1.4 Rubber gasket:

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

1.5 Fixtures

1.5.1 Hinges: Hinges shall be of approved make and shall be free from scratches, holes or any damage on surface and shall have finished lustre surface on all sides.

1.5.2 Handles: Handles shall be of approved make and shall be free from scratches, holes or damages on surface and shall have finished lustre surface on all sides.

1.5.3 Bolts: All bolts shall be of approved make and shall be free from scratches, holes or damages on surface and shall have finished lustre surface on all sides.

1.6 Workmanship

The work of window having extruded aluminium colour anodized section frame shall be carried out with extreme care and finishing. The glass shall be fixed in the shutter panels as directed by the Engineer in charge using glazing clips and EPDM rubber gasket as required.

All fixtures and fastenings shall be fitted at the correct position and as directed by the Engineer in charge. The sliding shutters shall run smoothly on tracks and shall be properly aligned so that opening and closing of shutters is easy and without obstruction.

All joints shall be properly sealed with transparent silicon sealant. The product shall be obtained from a reputed manufacturer having **ISO 9001–2000 certification** and shall carry a **three year performance guarantee**.

1.7 Mode of Measurement and Payment

The unit rate of window having extruded aluminium colour anodized section frame shall include the cost of all materials, cost of anodizing, cost of glass, mosquito net shutter, EPDM rubber gasket, air lock strip, silicon sealant and all necessary fixtures and fastenings.

The rate shall also include labour charges for fixing frame and window in wall at the location shown in drawings or as instructed by the Engineer in charge, including all tools and plants required for assembling and fixing in position, finishing as per direction of the Engineer in charge and all incidental expenses for preparing window frame and shutters of specified size complete as shown in the drawings and as per these specifications.

The rate shall also include the cost of making good the surrounding walls with plaster, colour etc. as directed by the Engineer in charge.

The window having extruded aluminium colour anodized section frame shall be measured for its **width and height**, limiting dimensions to those specified on the plan or as directed.

The **rate shall be for a unit of one square meter (Sq.M.)**.

Item No. 33

Providing and fixing THREE track sliding window (2 Glass shutters & 1 Mosquito net shutter) using standard extruded colour anodized aluminium section equivalent to Jindal series E (30 mm) section numbers: frame bottom with weep holes – 20928, frame top & sides – 20837, shutter top & bottom – 20993, shutter interlock – 20550, shutter side (handle) – 20549 with 5 mm thick transparent tinted float glass, with EPDM rubber gasket, air lock strip and finishing joints with transparent silicon sealant, with aluminium powder coated fittings and fixtures.

1.0 Material

1.1 Aluminium standard section:

Aluminium used in the manufacture of sliding window sections shall conform to IS designation **HEA–WP of IS:733–1975** and also designation **W.V.G.–WP of IS:1285–1975**. The sections shall be as per the specifications shown in the drawings and design. All sections shall be free from scratches, dents or any damage on the surface. All sections shall have finished lustre surface on wall sides.

1.1.1 The work includes three track sliding window (2 glass shutters + 1 mosquito net shutter) having standard extruded colour anodised aluminium sections equivalent to Jindal series E (30 mm). Section numbers shall be as follows:

1. Shutter top & bottom – 20993
2. Shutter interlock – 20550
3. Shutter side (handle) – 20549
4. Frame bottom with gutter – 20928
5. Frame top & side – 20837

The shutters shall be fitted with **5 mm thick transparent tinted float glass** fixed with EPDM rubber gasket, air lock strip and finishing joints with transparent silicon sealant, complete with standard extruded colour anodized aluminium coated fittings and fixtures along with mosquito net shutter as directed by the Engineer in charge.

1.2 Glass:

The transparent bronze colour tinted float glass shall be of approved make having thickness of **5 mm**. The glass shall be clear and free from scratches and cracks. The glass shall be fixed in shutter panels with transparent silicon gasket.

1.3 Glazing clips:

Glazing clips shall be of approved make and suitable size for fixing the glass panels. They shall be free from scratches, holes or any damage on surface and shall have finished lustre surface on all sides.

1.4 Rubber gasket:

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

1.5 Fixtures

1.5.1 Hinges: Hinges shall be of approved make and shall be free from scratches, holes or any damage on surface and shall have finished lustre surface on all sides.

1.5.2 Handles: Handles shall be of approved make and shall be free from scratches, holes or damages on surface and shall have finished lustre surface on all sides.

1.5.3 Bolts: All bolts shall be of approved make and shall be free from scratches, holes or damages on surface and shall have finished lustre surface on all sides.

1.6 Workmanship

The work of window having extruded aluminium colour anodized section frame shall be executed with proper finishing and accuracy. The glass shall be fixed in the shutter panels using glazing clips and EPDM rubber gasket as required and as directed by the Engineer in charge.

All fixtures and fastenings shall be properly fitted at the correct positions. The sliding shutters shall move smoothly on tracks and shall be properly aligned so that opening and closing is easy and without obstruction.

All joints shall be properly sealed with transparent silicon sealant. The product shall be obtained from a reputed manufacturer having **ISO 9001–2000 certification** and shall carry a **three year performance guarantee**.

1.7 Mode of Measurement and Payment

The unit rate of window having extruded aluminium colour anodized section frame shall include the cost of all materials, cost of anodizing, cost of glass, mosquito net shutter, EPDM rubber gasket, air lock strip, silicon sealant and all necessary fixtures and fastenings.

The rate shall also include labour charges for fixing frame and window in wall at the location shown in drawings or as instructed by the Engineer in charge, including all tools and plants required for assembling and fixing in position, finishing as per direction of the Engineer in charge and all incidental expenses for preparing window frame and shutters of specified size complete as shown in the drawings and as per these specifications.

The rate shall also include the cost of making good surrounding walls with plaster, colour etc. as directed by the Engineer in charge.

The window having extruded aluminium colour anodized section frame shall be measured for its **width and height**, limiting dimensions to those specified on the plan or as directed.

The **rate shall be for a unit of one square meter (Sq.M.)**.

Item No. 34

Providing and fixing standard extruded aluminium section of size 63 mm × 38.10 mm × 1.2 mm (Jindal section No. 2434, @ weight 0.643 kg per meter) with colour anodized aluminium frame for ventilation with 5 mm thick frosted glass as detailed etc. complete.

1.0 Material

1.1 Aluminium Standard Section:

Aluminium alloy used in the manufacture of extruded sections shall conform to **IS designation HEA–WP of IS:733–**

1975 and also designation **W.V.G.–WP of IS:1285–1975**. Sections shall be as specified in the drawings and design. All sections shall be free from scratches, holes or any damage on the surface and shall have finished lustre surface on all sides.

1.1.1 The ventilator frame shall consist of standard extruded aluminium section of size **63 mm × 38.10 mm × 1.2 mm thickness** equivalent to **Jindal section No. 2434** having minimum weight **0.643 kg per running meter**.

1.1.2 The aluminium frame shall be colour anodized and shall be of approved make and quality. The frame shall be fabricated and fixed in the wall opening to proper alignment, level and plumb complete as directed by the Engineer in charge.

1.2 Glass:

The glass shall be **5 mm thick frosted glass** of approved make and quality. The glass shall be clear, uniform and free from scratches, bubbles, cracks or other defects. The glass shall be fixed properly in the aluminium frame using suitable rubber gasket or glazing beads as required.

1.3 Anodized coloured aluminium section:

The aluminium section shall be colour anodized of approved make and company having smooth finished surface free from scratches or any deterioration. The entire work shall be carried out as per item description and as per instructions of the Engineer in charge with prior approval of the materials used for frame, glass, fixtures and fastenings. The fixing of ventilator shall be done properly in position and in true line and level.

2.0 Workmanship

The work of aluminium ventilator shall be carried out with proper workmanship and finishing. The aluminium sections shall be accurately cut, fabricated and assembled to form the ventilator frame of required size.

The **5 mm thick frosted glass** shall be fixed in the aluminium frame using suitable rubber gasket or glazing beads and sealed properly to prevent air or water leakage as directed by the Engineer in charge.

All fixtures and fastenings shall be fitted at correct positions and shall be of approved make. The ventilator frame shall be fixed firmly in the wall opening with necessary holdfasts, screws or coach bolts as required.

The surrounding surfaces shall be made good after fixing the ventilator and the finished work shall be neat, aligned and properly finished to the satisfaction of the Engineer in charge.

3.0 Mode of Measurement

3.1 The unit rate of aluminium ventilator shall include the cost of all materials, cost of anodizing, cost of frosted glass, rubber gasket, all necessary fixtures and fastenings, labour charges for fixing frame and fixing the ventilator in the wall at the position shown in the drawings or as instructed by the Engineer in charge, including all tools and plants required for assembling and fixing in position, finishing as directed and all incidental expenses for completing the work.

The rate shall also include the cost of making good surrounding walls with plaster patch, colour etc. as required.

3.2 The ventilator shall be measured for its **clear width and height**, limiting dimensions to those specified on the plan or as directed.

3.3 The rate shall be for a unit of one square meter (Sq.M.).

Item No. 35

Providing and fixing window having extruded aluminium colour anodized section frame main outer size **63.50 mm × 38.10 mm × 1.95 mm @ weight 1.094 kg per running meter**, horizontal two track member size **61.85 mm × 31.75 mm × 1.20 mm @ weight 0.695 kg per meter**, vertical member size **61.85 mm × 31.75 mm × 1.30 mm @ weight 0.659 kg per meter with sliding shutters of horizontal member size 40 mm × 18 mm × 1.29 mm @ weight 0.456 kg per meter and vertical member size 40 mm × 18 mm × 1.29 mm @**

weight 0.456 kg per meter with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminium fittings and fixtures and transparent silicon sealant for fixing glass to frame as per details etc. complete for window.

1.0 Material

1.1 Aluminium Standard Section:

Aluminium alloy used in the manufacture of extruded sections shall conform to **IS designation HEA-WP of IS:733-1975** and also designation **W.V.G.-WP of IS:1285-1975**. Sections shall be as specified in the drawings and design. All sections shall be free from scratches, dents, holes or any other surface defects and shall have finished lustre surface on all sides.

1.1.1 Frame Section:

The main outer frame shall consist of extruded aluminium colour anodized section of size **63.50 mm × 38.10 mm × 1.95 mm thickness** having minimum weight **1.094 kg per running meter**.

1.1.2 Track Members:

The frame shall include horizontal two track member of size **61.85 mm × 31.75 mm × 1.20 mm thickness** having weight **0.695 kg per meter** and vertical member of size **61.85 mm × 31.75 mm × 1.30 mm thickness** having weight **0.659 kg per meter**.

1.1.3 Shutter Members:

Sliding shutters shall consist of extruded aluminium sections having horizontal member of size **40 mm × 18 mm × 1.29 mm thickness** having weight **0.456 kg per meter** and vertical member of size **40 mm × 18 mm × 1.29 mm thickness** having weight **0.456 kg per meter**.

1.2 Glass:

The glass shall be **5 mm thick transparent bronze colour tinted float glass** of approved make and quality. The glass shall be clear and free from scratches, cracks, bubbles or other defects and shall be properly fixed in the shutter frame using transparent silicon sealant or suitable rubber gasket as required.

1.3 Anodized Aluminium Section:

The aluminium sections shall be colour anodized of approved make and quality having smooth finished surface free from scratches or deterioration. The anodizing shall be uniform throughout the surface of the sections.

1.4 Fixtures and Fittings:

All fittings and fixtures such as rollers, handles, locks, screws and other accessories shall be **powder coated aluminium fittings of approved make** and shall be fixed properly to ensure smooth sliding operation of the shutters.

2.0 Workmanship

The work of aluminium sliding window shall be carried out with proper workmanship and finishing. Aluminium sections shall be accurately cut, fabricated and assembled to form the window frame and shutters of required size.

The frame shall be fixed in the wall opening in true line, level and plumb with necessary fastenings as directed by the Engineer in charge. Sliding shutters shall be properly fitted with rollers and shall move smoothly on the track without obstruction.

The **5 mm thick tinted float glass** shall be fixed securely in the shutter frame using suitable rubber gasket or transparent silicon sealant. All joints shall be sealed properly to prevent air or water leakage.

All fixtures and fastenings shall be fixed at the proper locations. After fixing the window frame, surrounding surfaces shall be made good with plaster patch, colour etc. and the finished work shall be neat and properly aligned to the satisfaction of the Engineer in charge.

3.0 Mode of Measurement

- 3.1** The unit rate of aluminium window shall include the cost of all materials, cost of anodizing, cost of glass, cost of all fixtures and fastenings, labour charges for fixing frame and shutters in wall opening as shown in the drawings or as instructed by the Engineer in charge, including all tools and plants required for assembling and fixing in position and all incidental expenses for completing the work.
- 3.2** The window shall be measured for its **clear width and height**, limiting dimensions to those specified on the plan or as directed.
- 3.3** The **rate shall be for a unit of one square meter (Sq.M.)**

Item No. 44

Providing and fixing sandwich type standing platform in kitchen using 18 mm thick black granite on top and sides and 25 to 30 mm thick one side polished Kota stone in base including 0.60 m wide vertical supports of both side polished Kota stone and one horizontal shelf 0.60 m wide below platform as required and including 50 mm wide fascia patti in front including moulding the exposed edges in half round with all materials, tools and labour etc. complete as directed by the Engineer-in-Charge.

1.00 Materials

1.1 Granite

Granite shall be of approved quality, colour and texture and free from cracks, flaws or other defects. The granite stone shall be machine cut and machine polished and shall conform to relevant specifications given in the **General Technical Specifications for Building Works (Page No. 98)**. All moulding, polishing, groove work and finishing shall be carried out as required and as directed by the Engineer-in-Charge.

1.2 Kota Stone

Kota stone shall be of approved quality, uniform colour and free from cracks, cavities or defects. The stone shall be **25 mm to 30 mm thick**, machine cut and properly dressed with one side polished finish. The stone shall conform to **Material Specification M-52** as per the tender specification booklet.

1.3 Cement

Cement used for the work shall conform to **Material Specification M-3** and shall be fresh and free from lumps.

1.4 Sand

Sand used for mortar shall be clean, well graded and conform to **Material Specification M-6**.

1.5 Water

Water used for mixing and curing shall conform to **Material Specification M-1** and shall be clean and free from harmful salts or impurities.

1.6 Cement Mortar

The cement mortar used for fixing the stones shall be **cement mortar (1:3)** or as specified and shall conform to **Material Specification M-11**.

2.0 Construction / Workmanship

The sandwich type kitchen platform shall be constructed of the size and shape as directed by the Engineer-in-Charge, generally **0.70 m width and about 0.80 m height** from finished floor level.

The **top slab** shall consist of **18 mm thick black granite slab** of approved quality. Granite slabs shall preferably be provided in **single pieces up to 1.50 m length** wherever possible.

The granite top slab shall be supported on **25 mm thick polished Kota stone bottom slab** forming a sandwich arrangement. Vertical sandwich supports shall also be provided with **25 mm thick polished Kota stone slabs** at suitable intervals including **0.60 m wide vertical supports**.

A **horizontal shelf of 25 mm thick polished Kota stone, 0.60 m wide**, shall be provided below the platform as required.

A **50 mm wide granite fascia patti** shall be provided at the front of the platform with moulded edges. Vertical fascia patti of **25 mm thick polished Kota stone** shall also be provided where required.

All exposed edges of granite and Kota stone shall be **machine cut and finished with half round moulding** and properly polished. The stones shall be properly bedded and fixed in **cement mortar (1:3)** and the joints shall be neatly finished.

All surfaces shall be aligned, levelled and finished properly. After fixing, the work shall be cleaned and finished neatly to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

The work of sandwich type kitchen platform shall be **measured for finished work based on plan area only**.

The rate shall include the cost of **all materials, labour, tools and plants**, cutting, moulding, polishing, fixing, curing and all incidental works required to complete the item as specified.

The rate shall also include the cost of **granite top, Kota stone base, vertical supports, shelf, fascia patti, moulding of edges and finishing work**.

The **rate shall be for a unit of one square meter of plan area (Sq.m)** of finished platform.

Item No. 47

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

Materials :

Water shall conform to M-1, Cement shall conform to M-7, Sand shall conform to M-6, Mortar shall conform to M-11, Aggregate shall conform to M-12 of General Technical Specification of building works booklet. and precast C.C. M-30, 60mm interlocking block shall be made of approved company or as approved by Engineer-in-charge.

Workmanship :

The precast 60mm interlocking block shall be C.C. M-30, shall conform to item No. 5.3.13 P. No. 40 of General Technical Specification of building works booklet. Size and colour shall be as approved quality. The precast 60 mm thick interlocking block shall be laid on 75mm thick base of C.C. 1:5:1, and 35mm. thick sand layer, sand having abrasion value not more than 6%

Laying of Blocks :

Block should be laid commencing from the edge strip and proceed towards the inner side. The blocks can be placed to different bonds or patterns as directed by Engineer in charge with the help of gauge. The joint width specification (2 to 4 mm) should be checked in the first square meter where it would be ensured that the block alignment is correct. To start with full blocks should be used only subsequently. Cutting and infilling at edges be permitted. Under no circumstances should be block be forced or hammered into the bedding at this stage of laying. For cutting paving blocks hydraulic or mechanical block cutters or power saris are used. Cut units less than 50 mm minimum dimensions should not be used. Where space does not permit to use of a larger segment use premixed concrete or sand cement mortar instead the block shall be laid in line and level and to required camber and jointing in manner with cement mortar 1:3 with pigment to match the shade with precast C.C. block colour.

Mode of measurement and payment :

The work of 60 mm interlocking pavement by lock work shall be measured clear dimensions finished work in square meter.

The rate shall include leveling and preparation of sub grade procuring spreading and compacting of sub base material, supplying and fixing of precast M-35 C.C. block in jointing with C.M. 1:3 and fixing pavement blocks in required shape and pattern and filling joints and compacting using all tools. equipments materials and labour.

The payment shall be made on one square meter basis.

Item No. 48

Providing and fixing pre-cast concrete kerb stone of gray cement based concrete block 30cm length,30cm height and 15cm thick of M250 grade concrete as per approved design and including excavation for fixing in proper line and level, filling the joint with C:M 1:3 (1cement:3fine sand) etc complete.

Precast Concrete Kerb Stone

Precast concrete kerb stone shall be hard even sound, and regular in shape. Broken kerb stone or damaged one with cracks shall not be allowed for use. The precast kerb stone shall be of size as specified or as approved by the Engineer. It shall be 30 cm x 30 cm x 10 cm size made from cement concrete M 250 grade The precast kerb stone shall have flat plain surface. When brought on site, the precast kerb stone shall be in good condition.

WORKMANSHIP

Excavation for kerb block as required and as directed by the Engineer shall be carried out as per detailed relevant specifications of It. No. 1 of this contract. Bick bat cement concrete in proportion of 1:4:8 and 10 cm thick bedingshall be carried out as per the relevant specifications of general technical specification for building work booklet Item No.5.3.3/ page No. 39.

The kerb stone shall be erected in position in true line and level. The Joints between two blocks shall be filled with cement slurry and joint shall be flushed.

MODE OF MEASUREMENT & PAYMENT:

The unit rate shall include the cost of all material, labour charges for excavation & fixing, cost of BBCC, tools and plant required, placing blocks in position and all other incidental expenses required to complete the work.

The work shall be measured in running meter

The payment will be made **on running** meter basis.

Item No. 49

Providing and laying broken china mosaic flooring for terrace using 12 mm to 20 mm broken pieces of glazed tiles to be laid over cement mortar 1:3 to plain or slope and to be tempered to bring mortar crème out up to surface using white cement including rounding of junctions and extending them up to 15 cm along the wall, clearing with water and oxalic acid etc. as directed on 50 mm thick CC 1:2:4 concrete flooring.

1.0 Material

1.1 Water:

Water used for mixing and curing shall conform to **Material Specification M-1** of the *General Technical Specification for Building Works* booklet and shall be clean and free from harmful impurities.

1.2 Cement:

Cement used shall conform to **Material Specification M-3** and shall be fresh, free from lumps and of approved make.

1.3 Sand:

Sand shall be clean, well graded and conform to **Material Specification M-6** of the General Technical Specification for Building Works.

1.4 China Mosaic Tile Pieces:

Broken china mosaic pieces shall be of **glazed tile pieces of random size ranging from 12 mm to 20 mm thickness** and shall conform to **Material Specification M-55**. The pieces shall be hard, sound, clean and free from cracks, stains or defects.

1.5 Concrete Base:

The base shall consist of **50 mm thick cement concrete (1:2:4)** prepared with approved quality cement, sand and graded aggregates.

1.6 White Cement:

White cement used for finishing the surface shall be of approved make and good quality.

1.7 Waterproofing Material:

Waterproofing compound, if required, shall be of approved quality and make.

2.0 Workmanship

2.1 Preparation of Base

The terrace surface shall first be cleaned thoroughly and properly prepared. A **50 mm thick cement concrete layer (1:2:4)** shall be laid to the required slope or level as directed by the Engineer-in-Charge. The concrete base shall be finished rough to provide a proper bond with the mortar bedding.

2.2 Bedding

Over the concrete base, a **cement mortar bedding of average 20 mm thickness in cement mortar 1:3** shall be laid to the required level and slope. The bedding shall be evenly spread, properly compacted and finished to line and level.

The mortar shall possess sufficient plasticity and shall be free from lumps to ensure proper bonding with the mosaic pieces.

2.3 Laying China Mosaic

Broken china mosaic pieces of **12 mm to 20 mm thickness** shall be soaked in water for at least **two hours before laying**.

Neat cement slurry shall be spread over the bedding mortar and the broken glazed tile pieces shall be placed carefully in position. The pieces shall be properly pressed and gently tapped with wooden mallets so that they are firmly embedded in the mortar and properly aligned with adjoining pieces.

The work shall be carried out maintaining true line, level and required slope. Joints between the pieces shall be kept as small as possible.

The flooring shall be properly **tempered to bring the mortar cream to the surface** using white cement and the surface shall be finished uniformly.

2.4 Junctions and Finishing

The flooring shall be continued and **rounded at junctions with walls** and extended **up to 15 cm along the wall** to form a smooth waterproof cove.

After the flooring is set, joints shall be properly filled with cement grout and finished with white cement. The finished surface shall be properly cured by keeping it wet for **at least 7 days**.

2.5 Cleaning

After the flooring has set, the surface shall be thoroughly washed and cleaned. Any cement stains shall be removed by washing with **diluted oxalic acid solution** and the floor shall then be washed with clean water.

After completion, the terrace shall be **flooded with water** for testing and to ensure proper waterproofing.

3.0 Mode of Measurement & Payment

3.1 Measurement:

The work shall be measured in **square meters (Sq.m.)** for the finished visible area of flooring. Measurements shall be taken for length and width between the finished faces of walls.

No deduction shall be made for openings up to **0.10 Sq.m** and nothing extra shall be paid for laying flooring at different levels within the same area.

3.2 Rate:

The rate shall include the cost of **all materials, labour, tools and plants**, preparation of base, laying of **50 mm thick CC (1:2:4)**, mortar bedding, china mosaic pieces, white cement finishing, curing, cleaning with oxalic acid and all incidental work required to complete the item.

3.3 Payment:

Payment shall be made for **one square meter (Sq.m.) of finished work**.

Item No. 51

Providing and fixing chicken mesh jali with square of 12.50 x 12.50 mm of 25 gauge at junction the Brick.masonry and reinforcement cement concrete member, work done before plastering work including scaffolding etc complete.

1.0 Materials :-

- 1.1 Mild steel wire may be galvanized, as indicated. All finish steel wire shall be well cleanly drawn to the dimension, and size of wire mesh as per instructed by Engineer-in-charge. The wire shall be sound, free from splits, surface flaws, rough jagged and imperfect edges and other harmful surface defects and shall conform to I.S. 280-1978.

2.0 Workmanship :-

2.1 G.I. welded wire mesh - 20 gauge (Crimp Jali) of approved size shall be fixed between the RCC and masonry junction in proper line, level and plumb with all material, labour, tools, tackles and equipment. Including fixing the jali with nails and washer so that it hold the jali in line and level etc. complete as directed by the site in charge.

3.0 Mode of measurement and payment :

- 3.1 The rate includes cost of all labor, materials, tools, plants etc. required for satisfactorily completion of this item.
- 3.2 The rate shall be for a unit of one **Square meter**.

Item No. 52

Providing and making 10 mm wide groove in plaster in perfect line, level and plumb including the cost of scaffolding, tools and labour etc. complete as directed by the Engineer-in-Charge.

1.0 Materials

No major materials are required for this work except minor consumables such as cement slurry or finishing mortar where required. All materials used for finishing shall be of approved quality and conform to the relevant specifications of the *General Technical Specification for Building Works*.

2.0 Workmanship

The grooves shall be formed in plastered surfaces at the locations shown in drawings or as directed by the Engineer-in-Charge.

The groove shall be **10 mm wide** and of uniform depth and shall be made carefully using appropriate tools so that the edges remain sharp and straight. The groove shall be formed in **perfect line, level and plumb** as required.

The plaster surface shall first be properly marked to maintain uniform spacing and alignment before cutting the groove. The groove shall be neatly cut without damaging the surrounding plaster surface.

After forming the groove, the edges shall be cleaned and finished properly to obtain a neat appearance. Any loose material shall be removed and the groove shall be properly finished to the satisfaction of the Engineer-in-Charge.

The work shall include the cost of all **labour, tools, equipment and scaffolding** required to carry out the work at any height.

3.0 Mode of Measurement and Payment

The grooves shall be measured in **running meter (Rmt.)** for the actual length of groove executed.

The rate shall include the cost of **labour, tools, scaffolding, marking, cutting and finishing of grooves** and all incidental expenses necessary to complete the work as specified.

Payment shall be made for **one running meter (Rmt.) of finished groove work**.

Item No. 62

Providing and fixing framework in trusses and purlins including cutting, hoisting and fixing in position on columns/struts made of hollow M.S. pipe or I.S. section steel and applying a priming coat of red oxide paint including oil painting etc. complete as directed by the Engineer-in-Charge.

1.0 Materials

1.1 Mild Steel Sections:

The structural framework shall be fabricated from **hollow mild steel pipes or rolled steel sections (I.S. sections)** of approved quality conforming to relevant IS specifications. The sections shall be straight, true to size and free from defects.

1.2 Welding Materials:

Electrodes shall be of approved quality suitable for structural steel work.

1.3 Paint:

Primer shall be **red oxide zinc chromate / red lead primer** and finishing shall be done with **approved oil paint**.

1.4 Fasteners:

Bolts, nuts and washers shall be of approved quality conforming to relevant IS standards.

2.0 Workmanship

The framework for trusses and purlins shall be fabricated as per drawings. Members shall be cut, aligned and assembled properly.

All joints shall be **welded or bolted** as required. Welding shall be clean and properly finished.

The members shall be **hoisted and fixed in position** on columns/struts maintaining correct alignment, level and slope.

Before painting, the steel surface shall be cleaned and one coat of **red oxide primer** shall be applied. After erection, **two coats of oil paint** shall be applied.

The structure shall be completed **true in line, level and plumb** to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

The work shall be measured in **Quintal (Qntl)** based on the weight of fabricated and erected steel.

The rate shall include cost of **steel, fabrication, cutting, welding, hoisting, fixing, primer, painting, labour, tools and plants** and all incidental expenses.

Item No. 87

Providing, erecting and fixing double coated Syntex or equivalent PVC (ISI marked) water tank of required capacity including all necessary fittings and connections etc. complete on terrace as directed by the Engineer-in-Charge.

1.0 Materials

1.1 Water Tank:

The water tank shall be **double coated PVC tank of approved make such as Sintex or equivalent** and shall bear **ISI mark**. The tank shall be of required storage capacity as specified in the item and shall be manufactured from high quality food grade polyethylene suitable for storing potable water.

The tank shall be **UV stabilized, corrosion resistant, leak proof and durable** and shall be provided with proper lid and inlet, outlet, overflow and washout connections as required.

2.0 Workmanship

The water tank shall be **carefully transported, erected and fixed on the terrace** at the location shown in the drawings or as directed by the Engineer-in-Charge.

The tank shall be placed on a **properly prepared, level and firm base** such as RCC platform or masonry platform to ensure stability and uniform load distribution.

All inlet, outlet, overflow and washout connections shall be properly fixed and sealed to ensure leak-proof joints. The tank shall be aligned properly and fixed securely so that it remains stable during operation.

After installation, the tank and connections shall be checked for leakage and proper functioning to the satisfaction of the Engineer-in-Charge.

The work shall include all **labour, tools, equipment, scaffolding and incidental works** required to complete the installation.

3.0 Mode of Measurement and Payment

The water tank shall be measured **by number (Each)** according to the specified storage capacity.

Item No. 89

Providing and fixing acrylic name plate of required size on room with lettering etc. complete including all labour and materials as directed by the Engineer-in-Charge.

1.0 Materials

1.1 Acrylic Sheet:

The acrylic sheet used for name plate shall be of approved quality, clear and uniform in thickness. The sheet shall be free from scratches, cracks, bubbles or other defects and shall be of required thickness and size as specified.

1.2 Lettering:

Lettering on the name plate shall be done by **engraving, vinyl lettering, screen printing or laser cutting** as approved by the Engineer-in-Charge. The letters shall be clear, legible and properly finished.

1.3 Fixing Accessories:

The name plate shall be fixed using **stainless steel screws, brass screws or suitable fasteners with caps, stand-off studs or adhesives** as required. All fixing accessories shall be of approved quality.

2.0 Workmanship

The acrylic name plate shall be prepared in the **required size and design** as approved by the Engineer-in-Charge. The lettering shall be accurately done and properly aligned.

The plate shall be fixed at the **designated location on the room wall or door** using suitable screws, fasteners or adhesive so that it remains firm and properly aligned.

The surface shall be cleaned before fixing the name plate. The name plate shall be fixed in **true line and level** and the finished work shall be neat and properly aligned.

All edges of the acrylic sheet shall be **smoothly finished and polished**. The installation shall be completed without damaging the surrounding surface.

3.0 Mode of Measurement and Payment

The acrylic name plate shall be measured **by number (Each)** of completed units installed.

Item No. 90

Providing and constructing 100 cm high and 10 cm thick CC M-20 hand rail with 50 mm diameter round hollow stainless-steel pipe with 30 mm diameter stainless steel pipe supports of height 20 cm embedded in concrete etc. complete as directed by the Engineer-in-Charge.

1.0 Materials

1.1 Cement Concrete:

The handrail shall be constructed using **cement concrete of grade M-20** prepared with approved quality cement, sand and graded aggregates conforming to relevant specifications of the *General Technical Specifications for Building Works*.

1.2 Stainless Steel Pipe:

The handrail shall consist of **50 mm diameter round hollow stainless-steel pipe** of approved quality. The pipe shall be smooth, free from dents, cracks or surface defects and shall have proper finish.

1.3 Stainless Steel Supports:

Vertical supports shall be provided using **30 mm diameter stainless steel pipes of 20 cm height**. The supports shall be properly fixed and embedded in the concrete to provide adequate strength and stability.

1.4 Water:

Water used for mixing and curing of concrete shall conform to **Material Specification M-1** and shall be clean and free from harmful impurities.

2.0 Workmanship

The **CC M-20 handrail of 100 cm height and 10 cm thickness** shall be constructed in the position shown in the drawings or as directed by the Engineer-in-Charge.

Formwork shall be properly fixed and aligned before placing the concrete. Concrete shall be mixed, placed and compacted properly to achieve dense and uniform construction.

The **50 mm diameter round hollow stainless-steel pipe** shall be fixed at the top of the concrete handrail. The pipe shall be supported with **30 mm diameter stainless steel pipe supports of 20 cm height** which shall be properly embedded and fixed in the concrete to ensure stability.

All stainless-steel pipes shall be properly aligned in straight line and level. After placing the concrete, proper curing shall be carried out for at least **7 days**.

The finished surface shall be neat, properly aligned and free from defects to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

The handrail shall be measured in **running meter (Rmt.)** for the actual length of completed work.

The rate shall include the cost of **cement, sand, aggregates, stainless steel pipes, supports, labour, formwork, mixing, placing, curing, tools and plants** and all incidental expenses required to complete the work.

Item No. 91

Providing and constructing 30 cm high and 10 cm thick CC M-20 base with hand rail consisting of 50 mm diameter round hollow stainless-steel pipe supported on 30 mm diameter stainless steel pipe supports of height 90 cm embedded in concrete etc. complete as directed by the Engineer-in-Charge.

1.0 Materials

1.1 Cement Concrete:

The base shall be constructed using **cement concrete of grade M-20** prepared with approved quality cement, sand

and graded aggregates conforming to the relevant specifications of the *General Technical Specifications for Building Works*.

1.2 Stainless Steel Pipe (Hand Rail):

The hand rail shall consist of **50 mm diameter round hollow stainless-steel pipe** of approved quality and finish. The pipe shall be smooth, straight and free from dents, cracks or surface defects.

1.3 Stainless Steel Supports:

Vertical supports shall be made of **30 mm diameter stainless steel pipes of height 90 cm**. The supports shall be firmly fixed and embedded in the concrete base to ensure adequate strength and rigidity.

1.4 Water:

Water used for mixing and curing of concrete shall conform to **Material Specification M-1** and shall be clean and free from harmful salts or impurities.

2.0 Workmanship

A **30 cm high and 10 cm thick cement concrete (M-20) base** shall be constructed in the position shown on the drawings or as directed by the Engineer-in-Charge.

Proper formwork shall be provided and aligned before placing the concrete. The concrete shall be mixed, placed and compacted thoroughly to obtain dense and uniform concrete. The concrete shall be cured properly for at least **7 days**.

The **30 mm diameter stainless steel pipe supports of 90 cm height** shall be embedded firmly in the concrete base at suitable spacing. Over these supports, a **50 mm diameter round hollow stainless steel pipe hand rail** shall be fixed and aligned properly.

All stainless-steel pipes shall be fixed in **true line, level and plumb** and shall be securely connected to ensure stability and safety. The finished work shall be neat, properly aligned and to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

The hand rail work shall be measured in **running meter (Rmt.)** for the actual length of completed work.

The rate shall include the cost of **cement, sand, aggregates, stainless steel pipes, supports, labour, formwork, mixing, placing, curing, tools and plants** and all incidental expenses required to complete the work.

Item No. 92

Providing and fixing stainless steel letters of 15-inch height as directed by the Engineer-in-Charge.

1.0 Materials

1.1 Stainless Steel Letters:

The letters shall be fabricated from **stainless steel sheet of approved quality (generally SS 304 grade)** and shall be **15 inches (approx. 380 mm) high**. The stainless steel shall be corrosion resistant, smooth finished and free from dents, scratches or other surface defects.

The letters shall be properly cut and shaped by **laser cutting or equivalent process** to achieve clear and sharp edges. The surface shall have **mirror finish / matt finish** as approved by the Engineer-in-Charge.

1.2 Fixing Accessories:

The fixing shall include **stainless steel studs, screws, nuts, bolts, spacers or suitable adhesive fixing system** as required for proper installation. All fixing accessories shall be of approved quality and corrosion resistant.

2.0 Workmanship

The stainless-steel letters shall be fabricated in the required **font, size and style** as approved by the Engineer-in-Charge.

The letters shall be properly aligned and fixed on the **wall surface, fascia, board or structure** at the location shown in the drawing or as directed by the Engineer-in-Charge.

The fixing shall be carried out using **stud fixing, screws or adhesive system** ensuring that the letters remain firmly fixed and properly aligned. Proper spacing between letters shall be maintained to ensure uniform appearance.

Before fixing, the surface shall be cleaned and marked to ensure accurate positioning of the letters in **true line and level**.

After installation, the letters shall be cleaned and the finished work shall present a neat and uniform appearance to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

The stainless-steel letters shall be measured **by number (Each)** of letters fixed at site.

The rate shall include the cost of **stainless-steel material, fabrication, cutting, finishing, fixing accessories, labour, tools and plants** and all incidental expenses required to complete the work.

Payment shall be made for **each stainless-steel letter fixed and accepted at site**.

Item No. 96

Providing and fixing stainless steel (Grade-316) accessories, sheet cutlery basket of size 520 × 485 × 100 mm fixing on telescopic channel of length 500 mm including hardware such as handles, dead lock etc. for kitchen of approved brand as directed by the Engineer-in-Charge.

1.0 Materials

1.1 Stainless Steel Cutlery Basket:

The cutlery basket shall be fabricated from **stainless steel sheet of Grade-316** of approved quality and make. The basket shall be of size **520 mm × 485 mm × 100 mm** and shall be properly finished, smooth and free from dents, sharp edges or other surface defects.

The stainless steel sheet shall be corrosion resistant, durable and suitable for kitchen use.

1.2 Telescopic Channel:

The basket shall be mounted on **heavy duty telescopic channels of 500 mm length** of approved make. The channels shall ensure smooth sliding operation and shall be capable of carrying the required load without deformation.

1.3 Hardware and Fittings:

All necessary hardware and fittings such as **handles, dead lock, screws, nuts, bolts and fixing accessories** shall be of approved quality and suitable for the purpose.

2.0 Workmanship

The stainless steel cutlery basket shall be installed in the **kitchen cabinet or platform unit** at the location shown in drawings or as directed by the Engineer-in-Charge.

The **telescopic channels shall be properly aligned and securely fixed** to the cabinet frame so that the basket operates smoothly without obstruction.

The basket shall be mounted on the telescopic channels and all hardware including **handles, locking arrangement and fittings** shall be properly fixed.

The installation shall be carried out carefully ensuring **true alignment, smooth sliding movement and firm fixing**. The finished work shall be neat and properly aligned to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

The cutlery basket shall be measured **by number (Each)** for complete installed unit.

Item No. 97

Providing and fixing stainless steel (Grade-316) accessories, Thali basket of size 520 × 485 × 350 mm fixing on telescopic channel of length 500 mm including hardware such as handles, dead lock etc. for kitchen of approved brand as directed by the Engineer-in-Charge.

1.0 Materials

1.1 Stainless Steel Thali Basket:

The Thali basket shall be fabricated from **stainless steel sheet of Grade-316** of approved quality and make. The basket shall be of size **520 mm × 485 mm × 350 mm** and shall be properly finished with smooth surface free from dents, sharp edges or other defects.

The stainless steel shall be corrosion resistant and suitable for kitchen use.

1.2 Telescopic Channel:

The basket shall be mounted on **heavy duty telescopic channels of 500 mm length** of approved make. The channels shall provide smooth sliding movement and adequate load carrying capacity.

1.3 Hardware and Fittings:

The work shall include all necessary **handles, dead lock arrangement, screws, nuts, bolts and other fixing accessories** required for proper installation. All fittings shall be of approved quality and make.

2.0 Workmanship

The stainless steel Thali basket shall be installed in the **kitchen cabinet or platform unit** at the location shown in the drawings or as directed by the Engineer-in-Charge.

The **telescopic channels shall be fixed properly and aligned accurately** to ensure smooth and easy sliding operation. The basket shall be securely mounted on the channels and all hardware fittings including handles and locking arrangement shall be properly fixed.

The installation shall be carried out carefully ensuring **true line, level and firm fixing**. The basket shall slide smoothly without obstruction and the finished work shall be neat and properly aligned to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

The Thali basket shall be measured **by number (Each)** for the complete installed unit.

Item No. 98

Providing and fixing stainless steel (Grade-316) accessories, Plain basket of size 520 × 485 × 150 mm fixing on telescopic channel of length 500 mm including hardware such as handles, dead lock etc. for kitchen of approved brand as directed by the Engineer-in-Charge.

1.0 Materials

1.1 Stainless Steel Plain Basket:

The plain basket shall be fabricated from **stainless steel sheet of Grade-316** of approved quality and make. The basket shall be of size **520 mm × 485 mm × 150 mm** and shall have smooth finish free from dents, sharp edges or surface defects. The stainless steel shall be corrosion resistant and suitable for kitchen use.

1.2 Telescopic Channel:

The basket shall be mounted on **heavy duty telescopic channels of 500 mm length** of approved make. The channels shall ensure smooth sliding operation and shall have adequate load carrying capacity.

1.3 Hardware and Fittings:

The work shall include all necessary **handles, dead lock arrangement, screws, nuts, bolts and other fixing accessories** required for installation. All fittings shall be of approved quality and make.

2.0 Workmanship

The stainless steel plain basket shall be installed in the **kitchen cabinet or platform unit** at the position shown in drawings or as directed by the Engineer-in-Charge.

The **telescopic channels shall be properly aligned and securely fixed** to the cabinet frame to ensure smooth and easy sliding movement. The basket shall be mounted on the channels and all hardware including handles and locking arrangements shall be fixed properly.

The installation shall be carried out ensuring **true alignment, firm fixing and smooth sliding operation**. The finished work shall be neat and properly aligned to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

The plain basket shall be measured **by number (Each)** for the complete installed unit.

Item No. 99

Providing and fixing stainless steel (Grade-316) accessories, Cup Saucer basket of size 520 × 485 × 100 mm fixing on telescopic channel of length 500 mm including hardware such as handles, dead lock etc. for kitchen of approved brand as directed by the Engineer-in-Charge.

1.0 Materials

1.1 Stainless Steel Cup Saucer Basket:

The cup saucer basket shall be fabricated from **stainless steel sheet of Grade-316** of approved quality and make. The basket shall be of size **520 mm × 485 mm × 100 mm** and shall be properly finished with smooth surface free from dents, sharp edges or any defects.

The stainless steel shall be corrosion resistant, durable and suitable for kitchen use.

1.2 Telescopic Channel:

The basket shall be mounted on **heavy duty telescopic channels of 500 mm length** of approved make. The telescopic channels shall allow smooth sliding operation and shall have adequate load carrying capacity.

1.3 Hardware and Fittings:

The work shall include all necessary **handles, dead lock arrangement, screws, nuts, bolts and other fixing accessories** required for proper installation. All fittings shall be of approved quality and make.

2.0 Workmanship

The stainless steel cup saucer basket shall be installed in the **kitchen cabinet or platform unit** at the location shown in the drawings or as directed by the Engineer-in-Charge.

The **telescopic channels shall be properly aligned and securely fixed** to the cabinet frame to ensure smooth sliding operation. The basket shall be mounted on the channels and all hardware fittings including handles and locking arrangements shall be properly fixed.

The installation shall be carried out ensuring **true alignment, firm fixing and smooth movement** of the basket. The finished work shall be neat and properly aligned to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

The cup saucer basket shall be measured **by number (Each)** for the complete installed unit.

Item No. 100

Providing and fixing wardrobe / kitchen platform type cupboard using frame of country wood of size 7 cm × 2.5 cm thick all around and commercial 19 mm thick plywood for drawer and shutters with outside lamination of 1 mm thick Sunmica and inside lamination of 0.8 mm thick laminate including ISI make 300 mm high handles, hinges, magnetic ball catch, Europa make dead lock for doors, 6 inch high tower bolt to another shutter and other fixtures and fittings etc. complete as directed by the Engineer-in-Charge.

1.0 Materials

1.1 Country Wood Frame:

The cupboard frame shall be made from **country wood sections of size 7 cm × 2.5 cm** placed all around. The wood shall be well seasoned, free from knots, cracks, decay or other defects and shall be treated against termites as required.

1.2 Plywood:

Shutters and drawers shall be made from **commercial plywood of 19 mm thickness** of approved quality and make. The plywood shall be uniform, free from delamination, warping or other defects.

1.3 Laminate (Sunmica):

The outer surface of shutters and drawers shall be finished with **1 mm thick Sunmica laminate** of approved colour, shade and texture. The inner surfaces shall be laminated with **0.8 mm thick laminate**. The laminate shall be properly pasted using approved adhesive.

1.4 Handles:

Handles shall be **ISI marked handles of 300 mm height** of approved make and quality.

1.5 Hinges:

Hinges shall be of approved make and suitable size for cupboard shutters ensuring smooth opening and closing.

1.6 Locks:

Locks shall be **Europa make dead locks** or equivalent approved make and shall be fixed properly for secure locking.

1.7 Magnetic Ball Catch:

Magnetic ball catch shall be provided to ensure proper closing of shutters.

1.8 Tower Bolt:

A **6 inch high tower bolt** shall be provided for the additional shutter as required.

1.9 Fixing Accessories:

All necessary fixtures and fittings such as **screws, nails, brackets, adhesive and other accessories** shall be of approved quality.

2.0 Workmanship

The cupboard shall be fabricated using **country wood frame of size 7 cm × 2.5 cm** and **19 mm commercial plywood** for shutters and drawers.

All plywood surfaces shall be finished with **laminates of 1 mm thickness on the outer side and 0.8 mm thickness on the inner side** using approved adhesive. The edges shall be neatly finished and properly aligned.

All **handles, hinges, locks, magnetic ball catch and tower bolts** shall be properly fixed at appropriate positions to ensure smooth operation of shutters and drawers.

The cupboard shall be fixed in position in **true line, level and plumb** at the location shown in drawings or as directed by the Engineer-in-Charge.

All joints shall be properly finished and the completed work shall be neat, properly aligned and finished to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

The cupboard work shall be measured in **square meter (Sq.m.)** for the finished visible surface area.

Item No. 101

Box cutting the road surface to proper slope and camber for making a base for road work including removing the excavated stuff and depositing on the road side slope as directed upto all lead.

1. This work shall consist of excavation, removal and satisfactory disposal of all materials necessary for the construction of widening carriageway in accordance with requirements of these specifications and the lines, grades and cross sections shown in the drawings or as indicated by the Engineer.
2. After the site has been cleared the limits of excavation box cutting the road surface shall be set out true to lines, curves, slopes, grades and sections as shown on the drawings or as directed by the Engineer.
3. Box cutting shall be carried out in conformity with the directions laid here in under and in a manner approved by the Engineer. The work shall be so done that the suitable materials available from box cutting excavation are satisfactorily utilized as directed.
4. The contractor shall not excavate outside the limits of box cutting. Subject to the permitted tolerances, any excess depth width excavated beyond the specified levels dimensions on the drawings shall be made good at the cost of the contractor with suitable material of characteristics similar to that removed and compacted as directed.
5. Cutting shall be done in proper grade and camber as per measurements given. Care must be taken that all slopes are evenly and truly dressed. Cutting shall be done to the exact depth required and shall be as per formation level in proper grade and the camber. If extra depth of cutting is done due to negligence of contractor the same shall be refilled with approved quality of materials duly consolidated to the satisfaction of the Engineer-incharge (without extra cost).
6. The bottom level of box cutting i.e. sub grade shall be watered and well compacted with vibratory roller at OMC to the desired density as directed by the Engineer in charge. Rolling and compaction shall be deemed to be incidental to the work and no extra cost shall be paid for compaction of box cutting base surface.
7. The stuff received from the cutting shall be used for filling and correcting side slopes of bank and earthwork for embankment as directed by the Engineer in charge with all lead and lift.
8. The measurement of box cutting shall be taken on level basis and level shall be taken at 30 mt. interval. Volume shall be computed in cubic meters by average area method.
9. The payment shall be made **on Cmt.** basis.
10. The rate includes cost of all labour, machineries required, cost of carting and spreading the cutting stuff with all lead and lift and leveling the dumping ground embankment, rolling and consolidation of subgrade level etc. complete.

Item No. 102

Providing and laying compacted W.B.M. 150mm thick of grade-II in two layers each of 75mm thick of machine crushed BT metal of size 40mm to 63mm with using 13% stone screenings of 13.2mm size and 7% stone dust as filler including spreading watering and consolidation by vibratory roller etc. comp. in single layers

1 SCOPE :

1.1 This work shall consist of clean, crushed aggregates mechanically interlocked by rolling and bounding together with screening, binding material where necessary and water laid on a properly prepared sub grade/sub-base or existing pavement as the case may be and finished in accordance with the requirements of these specifications and in close conformity with the lines, grades, cross-sections and thickness as per approved plans or as directed by the Engineer.

2 MATERIALS**2.1 COARSE AGGREGATES:**

Course aggregates shall be crushed stone. The aggregates shall conform to the physical requirements set forth in table. The type and size range of the aggregate shall be specified in the contract or shall be as specified by the Engineer. If the water absorption value of the coarse aggregate is greater than 2 percent, the soundness test shall be carried out on the material delivered to site as per IS:2386 (Part-5)

2.2 CRUSHED

The crushed stone shall hard durable and free from excess flat, elongated soft and disintegrated particles, dirt and other deleterious material.

Table – PHYSICAL REQUIREMENTS OF COARSE AGGREGATES FOR WATER BOUND MACADAM FOR SUB-BASECOURSES.

Test	Test method		Requirements
1.	Los Angles Abrasion value or *Aggregate Impact value	IS – 2386 (part-4) IS: 2386(Part-4) or IS:5640**	40 percent (Max) 30 percent (Max)
2	Combined Flakiness and Elongation Indices (Total)	IS:2386 (Part-I)	30 percent (max)

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

** Aggregates like metal. etc. which get softened in presence of water shall be tested for impact value wet conditions in accordance with IS:5640.

*** The requirement of flakiness index and elongation index shall be enforced only in the case of crushed broken stone.

2.3 GRADING REQUIREMENTG OF COARSE AGGREGATES:

The coarse aggregates shall conform to one of the Gradings given in Table-2 as a specified below

TABLE -2 Grading requirements of Coarse Aggregates.

Grading No.	Size Range	IS Sieve Designation	Percent by Weight passing
1.	90 mm to 45mm	125mm 90mm	100 90-100
		63mm 45mm 22.4mm	25-60 0-15 0-5
2.	63 mm to 40 mm	90mm 63mm 53mm 40mm 22.4mm	100 90-100 25-75 0-15 0-5

2.4 BINDING MATERIAL

Binding material to be used for water bound macadam as a filter material meant for preventing relayering shall comprise of a suitable material approved by the Engineer having Plasticity Index (PI) value of less than 6 as determined in accordance with IS:2720(Part-5). Generally the quantity as binding material required for water bound macadam will be 10% as Quantity of stone aggregate.

The above mentioned quantities should be taken as guide only for estimation of quantities for construction etc.

3 CONSTRUCTION OPERATION :

3.1 PREPARATION OF BASE :

The surface of the sub grade/ sub-base to receive the water bound macadam course shall be prepared the specified lines and crossfall (camber) and made free of dust and other extraneous material. Any ruts or soft yielding place shall be corrected in an approved manner and rolled until firm surface in obtained in necessary by sprinkling water. Any sub-base/base surface irregularities where predominate shall be made good by providing appropriate type of profit corrective course (levelling course) to clause 501 (MOST 1995) of these specifications. As far as possible laying water bound macadam course over an existing thick bituminous layer may be avoided since it will cause problems of internal drainage of the payment at the interface of two courses. It is desirable to completely pick out the existing thin bituminous wearing course where water bound macadam is proposed to be laid over it. However, where the intensity of rain is low and the interface drainage facility is efficient water bound macadam can be laid over the existing thin bituminous surface by cutting 50mm x 50mm furrows at angel of 45 degreeet be centre line of the pavement at one meter intervals in the existing road. the directions and depth of furrows shall be such that they provide adequate bondage and also serve to drain water to the existing granular base course beneath the existing thin bituminous surface.

3.2 the coarse aggregates shall be uniformly and evenly upon the prepared sub grades/subbase/ base to proper profile by using templates placed across the road about 6 m apart in such quantities that the thickness of each compacted layer is not more than 100mm for grading. I as specified in Clause 2.2.3 wherever possible approved mechanical devices such as aggregate spreader shall be used to spread the aggregates uniformly

so as to minimise the need for manual rectification afterwards. Aggregates placed at location which are inaccessible to the spreading equipment may be spread in one or more layers by any approved means so as to achieve the specified results.

The spreading shall be done from stockpiles along the side roadway or directly from vehicles. No segregation of large or fine aggregates shall be allowed and the coarse aggregates as spread shall be of uniform gradation with no pockets of fine material.

The surface of the aggregates spread shall be carefully checked with templates and all high or low spots remedied by removing or adding aggregates as may be required. The surface shall be checked frequently with straight edge while a straight edge while spreading and rolling so as to ensure a finished surface as per approved drawings.

The coarse aggregates shall not normally be spread more than 3 days in advance of the subsequent construction operations.

3.3 ROLLING :

Immediately following the spreading of the coarse aggregate rolling shall be started with three wheeled vibrating rollers of 80 to 100 KN capacity. The type of roller to be used shall be approved by the Engineer based on trial run.

Except on super elevated portions where the rolling shall proceed from inner edge to the outer, rolling shall be from the edges gradually progressing towards the centre. First the edge/edges shall be compacted with roller running forward and backward. The roller shall then move inward parallel to the centre line of the road in successive passes uniformly lapping preceding tracks by at least one half width.

Rolling shall be discontinued when the aggregates are partially compacted with sufficient void space in them to permit application of screening. However, where screenings are not to be applied as in the case of crushed aggregates like brick, metal, laterite and kanker, compaction shall be continued until the aggregates are thoroughly keyed. During rolling slight sprinkling may be done, if necessary. Rolling shall not be done when the sub grade is soft or yielding or when it causes a wave like motion in the sub grade or sub-base course.

The rolled surface shall be checked transversely and longitudinally with templates and any irregularities corrected by loosening the surface adding or removing necessary amount of aggregates and re-rolling until the entire surface conforms to desired crossfall (camber) and grade.

In no case shall the use of screening be permitted to make depression.

Material which gets crushed excessively during compaction or becomes segregated shall be removed and replaced with suitable aggregates.

It shall be ensured that shoulders are built up simultaneously along with water bound macadam courses as per C&A 407.4.1 (MOST 195)

3.4 SPRINKLING OF WATER AND GROUTING :

After the binding material has been applied the surface shall be copiously sprinkled with water, swept and rolled. Hand brooms shall be used to sweep the wet screenings into voids and to distribute them evenly. The sprinkling, sweeping and rolling operation shall be continued with additional binding material applied as necessary until the coarse aggregate has thoroughly keyed, well bounded and firmly set in its full depth and a grout has been formed of screenings. Care shall be taken to see that the base or sub grade does not get damaged due to the addition of excessive quantities of water during construction.

In case of lime treated soil sub-base, construction of water bound macadam on top of it can cause excessive water to flow down to the lime treated sub-base before it has picked up enough strength (is still 'green') and thus cause damage to the sub-base layer. The laying of water bound macadam layer in such cases shall be done after the sub-base attains adequate strength as directed by the Engineer.

3.5 APPLICATION OF BINDING MATERIAL

After the application of crush metal accordance with clauses 404.3.5 and 404.3.6 (MOST 195). The binding material (clause 2.2.4) shall be applied successively in two or more thin layers at a slow and uniform rate. After each application the surface shall be copiously sprinkled with water the resulting slurry swept in with hand brooms or mechanical brooms to fill the voids properly and rolled during which water shall be applied to the wheels of the rollers if necessary to wash sown the binding material sticking to them. These operations shall continue until the resetting slurry after filling of voids, forms a wave ahead of the wheels of the moving roller.

3.6 SETTING AND DRYING

After the final compaction of water bound macadam course the pavement shall be allowed to dry overnight. Night morning hungry spots shall be filled with screenings or binding materials as directed lightly sprinkled with water if necessary and rolled. No traffic shall be allowed on the road until the macadam has set. The Engineer shall have the discretion to stop hauling traffic from using the completed water bound macadam course, if in his opinion it would cause excessive damage to the surface.

4 SURFACE FINISH AND QUALITY CONTROL OF WORK

- 4.1 The surface finish of construction shall conform to the requirement of clause 902 (MOST 1995)
- 4.2 Control on the quality of material and works shall be exercised by the Engineer in accordance with section 900 (MOPST 1995).
- 4.3 The water bound macadam work shall not be carried out when the atmospheric temperature is less than 0°C in the shade.

4.4 RECONSTRUCTION OF DEFECTIVE MACADAM

The finished surface of water bound macadam shall conform to the tolerance of surface regularity as prescribed in clause 902 (MOST 1995). However where the surface irregularity of the course exceeds the tolerance or where the course is otherwise defective due to sub grade soil mixing with the aggregates the course to its full thickness shall be scarified over the affected area, reshaped with added material or removed and replaced with fresh material as applicable and recompacted. In no case shall depressions be filled up with binding material.

5 ARRANGEMENT FOR TRAFFIC

During the period of construction the arrangement of traffic shall be done as per clause 112 (MOST 1995)

6 TRAFFIC SAFETY AND CONTROL

The contractor shall take all necessary for the safety to traffic during construction and provide erect and maintain such barricades, including signs, marking, flags, lights and flagmen as may be required by the Engineer-in-charge for the information and protection of traffic approaching or passing through the section

of the highway under improvement. Before taking up any consultation with an agreed phased programme for the diversion of traffic on the highway shall be drawn up in consultation with the Engineer-in-charge.

The barricades erected on either side of the carriage/portion of the carriageway closed to traffic shall be of strong design to resist violation and painted with alternate black and white strips. Red lanterns or warning lights of similar type shall be mounted on the barricades at night and kept in throughout from sunset to sunrise.

At the points where traffic is to deviate from its normal path (whether on temporary diversion or part width of the carriageway) the channel for traffic shall be clearly marked with the aid of pavement markings painted drums or a other suitable light source.

One way traffic operation shall be established wherever the traffic is to be passed over part of the carriageway inadequate for two-lane traffic.

This shall be done with the help of flagmen kept positioned on opposite sites during all hours for regulation of traffic. The flagmen shall be equipped with red and green flags and lantern light.

On both sided suitable regulatory/warning signs shall be installed for the guidance of road users. On each approach at least two sign shall be put up one close to the point where transition of carriageway begins and the other 120 meters away. The signs shall be of approved design and of reflectory type if so directed.

7 MAINTAINANCE OF DIVERSIONS AND TRAFFIC CONTROL DEVICES

Signs light barriers and other traffic control devices as well as the riding surface of diversions shall be maintained in satisfactory condition till such time they are required as directed by the engineer-in-charge. The temporary travelled way shall be kept free of dust by frequent application to water if necessary.

8 MEASUREMENTS FOR PAYMENTS FOR W.B.M.

8.1 Water bound macadam shall be measured as finished work in position in cubic meters. The finished thickness of sub-base and base courses to be paid on volume basis shall be computed in the following manner.

Levels shall be taken before and after construction at a grid of points 10 meters apart to centre longitudinally in straight trenches but 5 meters at curves. Normally on two lane roads the levels shall be taken at fore position transversely at 0.75 and 2.75 meters from either edge of the carriageway and on single lane roads these shall be taken at two position transversely being at 1.25 meter from either edge of the carriageway.

Suitable reference for the transverse grid line should be left in the embedded brick on either ends or by the means so that it is possible to locate the grid points for level measurements after each successive course is laid. For payment courses laid only widening portion, at least one line of levels shall be taken on each strip of widening or more depending on the width on the widening as decided by the Engineer-in-charge. Notwithstanding the above, the need for which may arise particularly in the case of estimation of the volume of the material for leveling course. The average thickness of the payment course shall be the arithmetical mean of the difference of levels before & after construction at all the grid points filling in area, provided that thickness of finished work shall be limited to those shown on the drawings or approved by the Engineer-in-charge in writing.

As supplement to level measurements, the Engineer-in-charge shall have the option to cut cores/holes to check on the depth of construction.

The contractor shall sing day to day leveling work and also original cross section, longitudinal section in token of his acceptance etc. The working sections both longitudinal and cross of the sub grade shall be taken by the Engineer-in-charge before the actual WBM work is started. The contractor or his authorised representative shall attend day to day leveling work and sign with date the field book daily to token of his acceptance. If there is any disagreement the contractor shall inform of it in writing to the officer concerned with specific reference to the sections before starting further work.

Once the work is started no cognizance of any complaint taken. Merely not signing of the level book shall not be deemed as disagreement. the Executive Engineer shall verify leveling work to the extent of 5 percent before commencement of WBM to proper formation and grade till this item is finally measured and accepted by the Department. The measurement shall be taken on compacted WBM. Any crack formation of screenings observed in between layer of WBM work shall be deducted from the measurements so taken and net quantity of WBM work shall be considered for payment.

9. RATE:

- 9.1 The control unit for WBM sub based/base course shall be payment in full for carrying out the required out the required operation including full compensation for all component listed below.
The rate shall be on Cum. Basis.
The payment shall be made on one Cum. Basis of finished work.

The rate shall be for a unit of one Cum

Item No. 103

Providing and laying compacted WBM 100 mm thick of grading I ,B.T.M.C.metal of size of size 45 to 90 mm in required layers including using 20% stone screening 13.20 mm size and 7% stone dust as filler including spreading watering and consolidation by vibratory roller etc complete.

1 SCOPE :

- 1.1 This work shall consist of clean, crushed aggregates mechanically interlocked by rolling and bounding together with screening, binding material where necessary and water laid on a properly prepared sub grade/sub-base or existing pavement as the case may be and finished in accordance with the requirements of these specifications and in close conformity with the lines, grades, cross-sections and thickness as per approved plans or as directed by the Engineer.

2 MATERIALS

2.1 COARSE AGGREGATES:

Course aggregates shall be crushed stone. The aggregates shall conform to the physical requirements set forth in table. The type and size range of the aggregate shall be specified in the contract or shall be as specified by the Engineer. If the water absorption value of the coarse aggregate is greater than 2 percent, the soundness test shall be carried out on the material delivered to site as per IS:2386 (Part-5)

2.2 CRUSHED

The crushed stone shall hard durable and free from excess flat, elongated soft and disintegrated particles, dirt and other deleterious material.

Table – PHYSICAL REQUIREMENTS OF COARSE AGGREGATES FOR WATER BOUND MACADAM FOR SUB-BASECOURSES.

Test	Test method		Requirements
1.	Los Angeles Abrasion value or *Aggregate Impact value	IS – 2386 (part-4) IS: 2386(Part-4) or IS:5640**	40 percent (Max) 30 percent (Max)
2	Combined Flakiness and Elongation Indices (Total)	IS:2386 (Part-I)	30 percent (max)

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

** Aggregates like metal. etc. which get softened in presence of water shall be tested for impact value wet conditions in accordance with IS:5640.

*** The requirement of flakiness index and elongation index shall be enforced only in the case of crushed broken stone.

2.3 GRADING REQUIREMENTS OF COARSE AGGREGATES:

The coarse aggregates shall conform to one of the Gradings given in Table-2 as a specified below

TABLE -2 Grading requirements of Coarse Aggregates.

Grading No.	Size Range	IS Sieve Designation	Percent by Weight passing
1.	90 mm to 45mm	125mm 90mm	100 90-100
		63mm 45mm 22.4mm	25-60 0-15 0-5
2.	63 mm to 40 mm	90mm 63mm 53mm 40mm 22.4mm	100 90-100 25-75 0-15 0-5

2.4 BINDING MATERIAL

Binding material to be used for water bound macadam as a filter material meant for preventing relayering shall comprise of a suitable material approved by the Engineer having Plasticity Index (PI) value of less than 6 as determined in accordance with IS:2720(Part-5). Generally the quantity as binding material required for water bound macadam will be 10% as Quantity of stone aggregate.

The above mentioned quantities should be taken as guide only for estimation of quantities for construction etc.

3 CONSTRUCTION OPERATION :

3.1 PREPARATION OF BASE :

The surface of the sub grade/ sub-base to receive the water bound macadam course shall be prepared the specified lines and crossfall (camber) and made free of dust and other extraneous material. Any ruts or soft yielding place shall be corrected in an approved manner and rolled until firm surface is obtained in necessary by sprinkling water. Any sub-base/base surface irregularities where predominate shall be made good by providing appropriate type of profit corrective course (levelling course) to clause 501 (MOST 1995) of these specifications. As far as possible laying water bound macadam course over an existing thick bituminous layer may be avoided since it will cause problems of internal drainage of the pavement at the interface of two courses. It is desirable to completely pick out the existing thin bituminous wearing course where water bound macadam is proposed to be laid over it. However, where the intensity of rain is low and the interface drainage facility is efficient water bound macadam can be laid over the existing thin bituminous surface by cutting 50mm x 50mm furrows at angle of 45 degree to be centre line of the pavement at one meter intervals in the existing road. the directions and depth of furrows shall be such that they provide adequate bondage and also serve to drain water to the existing granular base course beneath the existing thin bituminous surface.

- 3.2** the coarse aggregates shall be uniformly and evenly upon the prepared sub grades/subbase/ base to proper profile by using templates placed across the road about 6 m apart in such quantities that the thickness of each compacted layer is not more than 100mm for grading. As specified in Clause 2.2.3 wherever possible approved mechanical devices such as aggregate spreader shall be used to spread the aggregates uniformly so as to minimise the need for manual rectification afterwards. Aggregates placed at location which are inaccessible to the spreading equipment may be spread in one or more layers by any approved means so as achieve the specified results.

The spreading shall be done from stockpiles along the side roadway or directly from vehicles. No segregation of large or fine aggregates shall be allowed and the coarse aggregates as spread shall be of uniform gradation with no pockets of fine material.

The surface of the aggregates spread shall be carefully checked with templates and all high or low spots remedied by removing or adding aggregators as may be required. The surface shall be checked frequently with straight edge while a straight edge while spreading and rolling so as to ensure a finished surface as per approved drawings.

The coarse aggregates shall not normally be spread more than 3 days in advance of the subsequent construction operations.

3.3 ROLLING :

Immediately following the spreading of the coarse aggregate rolling shall be started with three wheeled vibrating rollers of 80 to 100 KN capacity. The type of roller to be used shall be approved by the Engineer based on trial run.

Except on super elevated portions where the rolling shall proceed from inner edge to the outer, rolling shall begin from the edges gradually progressing towards the centre. First the edge/edges shall be compacted with roller running forward and backward. The roller shall then move inward parallel to the centre line of the road in successive passes uniformly lapping preceding tracks by at least one half width.

Rolling shall be discontinued when the aggregates are partially compacted with sufficient void space in them to permit application of screening. However, where screenings are not to be applied as in the case of

crushed aggregates like brick, metal, laterite and kanker, compaction shall be continued until the aggregates are thoroughly keyed. During rolling slight sprinkling may be done, if necessary. Rolling shall not be done when the sub grade is soft or yielding or when it causes a wave like motion in the sub grade or sub-base course.

The rolled surface shall be checked transversely and longitudinally with templates and any irregularities corrected by loosening the surface adding or removing necessary amount of aggregates and re-rolling until the entire surface conforms to desired crossfall (camber) and grade.

In no case shall the use of screening be permitted to make depression.

Material which gets crushed excessively during compaction or becomes segregated shall be removed and replaced with suitable aggregates.

It shall be ensured that shoulders are built up simultaneously along with water bound macadam courses as per Clause 407.4.1 (MOST 195)

3.4 SPRINKLING OF WATER AND GROUTING :

After the binding material has been applied the surface shall be copiously sprinkled with water, swept and rolled. Hand brooms shall be used to sweep the wet screenings into voids and to distribute them evenly. The sprinkling, sweeping and rolling operation shall be continued with additional binding material applied as necessary until the coarse aggregate has thoroughly keyed, well bounded and firmly set in its full depth and a grout has been formed of screenings. Care shall be taken to see that the base or sub grade does not get damaged due to the addition of excessive quantities of water during construction.

In case of lime treated soil sub-base, construction of water bound macadam on top of it can cause excessive water to flow down to the lime treated sub-base before it has picked up enough strength (is still 'green') and thus cause damage to the sub-base layer. The laying of water bound macadam layer in such cases shall be done after the sub-base attains adequate strength as directed by the Engineer.

3.5 APPLICATION OF BINDING MATERIAL

After the application of crushed metal accordance with clauses 404.3.5 and 404.3.6 (MOST 195). The binding material (clause 2.2.4) shall be applied successively in two or more thin layers at a slow and uniform rate. After each application the surface shall be copiously sprinkled with water the resulting slurry swept in with hand brooms or mechanical brooms to fill the voids properly and rolled during which water shall be applied to the wheels of the rollers if necessary to wash down the binding material sticking to them. These operations shall continue until the resetting slurry after filling of voids, forms a wave ahead of the wheels of the moving roller.

3.6 SETTING AND DRYING

After the final compaction of water bound macadam course the pavement shall be allowed to dry overnight. Night morning hungry spots shall be filled with screenings or binding materials as directed lightly sprinkled with water if necessary and rolled. No traffic shall be allowed on the road until the macadam has set. The Engineer shall have the discretion to stop hauling traffic from using the completed water bound macadam course, if in his opinion it would cause excessive damage to the surface.

4 SURFACE FINISH AND QUALITY CONTROL OF WORK

4.1 The surface finish of construction shall conform to the requirement of clause 902 (MOST 1995)

4.2 Control on the quality of material and works shall be exercised by the Engineer in accordance with section 900 (MOPST 1995).

4.3 The water bound macadam work shall not be carried out when the atmospheric temperature is less than 0°C in the shade.

4.4 RECONSTRUCTION OF DEFECTIVE MACADAM

The finished surface of water bound macadam shall conform to the tolerance of surface regularity as prescribed in clause 902 (MOPST 1995). However where the surface irregularity of the course exceeds the tolerance or where the course is otherwise defective due to sub grade soil mixing with the aggregates the course to its full thickness shall be scarified over the affected area, reshaped with added material or removed and replaced with fresh material as applicable and recompacted. In no case shall depressions be filled up with binding material.

5 ARRANGEMENT FOR TRAFFIC

During the period of construction the arrangement of traffic shall be done as per clause 112 (MOPST 1995)

6 TRAFFIC SAFETY AND CONTROL

The contractor shall take all necessary for the safety to traffic during construction and provide erect and maintain such barricades, including signs, marking, flags, lights and flagmen as may be required by the Engineer-in-charge for the information and protection of traffic approaching or passing through the section of the highway under improvement. Before taking up any consultation with an agreed phased programme for the diversion of traffic on the highway shall be drawn up in consultation with the Engineer-in-charge.

The barricades erected on either side of the carriage/portion of the carriageway closed to traffic shall be of strong design to resist violation and painted with alternate black and white strips. Red lanterns or warning lights of similar type shall be mounted on the barricades at night and kept in throughout from sunset to sunrise.

At the points where traffic is to deviate from its normal path (whether on temporary diversion or part width of the carriageway) the channel for traffic shall be clearly marked with the aid of pavement markings painted drums or a other suitable light source.

One way traffic operation shall be established wherever the traffic is to be passed over part of the carriageway inadequate for two-lane traffic.

This shall be done with the help of flagmen kept positioned on opposite sites during all hours for regulation of traffic. The flagmen shall be equipped with red and green flags and lantern light.

On both sided suitable regulatory/warning signs shall be installed for the guidance of road users. On each approach at least two sign shall be put up one close to the point where transition of carriageway begins and the other 120 meters away. The signs shall be of approved design and of reflectory type if so directed.

7 MAINTENANCE OF DIVERSIONS AND TRAFFIC CONTROL DEVICES

Signs light barriers and other traffic control devices as well as the riding surface of diversions shall be maintained in satisfactory condition till such time they are required as directed by the engineer-in-charge. The temporary travelled way shall be kept free of dust by frequent application to water if necessary.

8 MEASUREMENTS FOR PAYMENTS FOR W.B.M.

- 8.1 Water bound macadam shall be measured as finished work in position in cubic meters. The finished thickness of sub-base and base courses to be paid on volume basis shall be computed in the following manner.

Levels shall be taken before and after construction at a grid of points 10 meters apart to centre longitudinally in straight trenches but 5 meters at curves. Normally on two lane roads the levels shall be taken at four position transversely at 0.75 and 2.75 meters from either edge of the carriageway and on single lane roads these shall be taken at two position transversely being at 1.25 meter from either edge of the carriageway.

Suitable reference for the transverse grid line should be left in the embedded brick on either ends or by the means so that it is possible to locate the grid points for level measurements after each successive course is laid. For payment courses laid only widening portion, at least one line of levels shall be taken on each strip of widening or more depending on the width on the widening as decided by the Engineer-in-charge. Notwithstanding the above, the need for which may arise particularly in the case of estimation of the volume of the material for leveling course. The average thickness of the payment course shall be the arithmetical mean of the difference of levels before & after construction at all the grid points filling in area, provided that thickness of finished work shall be limited to those shown on the drawings or approved by the Engineer-in-charge in writing.

As supplement to level measurements, the Engineer-in-charge shall have the option to cut cores/holes to check on the depth of construction.

The contractor shall sign day to day leveling work and also original cross section, longitudinal section in token of his acceptance etc. The working sections both longitudinal and cross of the sub grade shall be taken by the Engineer-in-charge before the actual WBM work is started. The contractor or his authorised representative shall attend day to day leveling work and sign with date the field book daily in token of his acceptance. If there is any disagreement the contractor shall inform of it in writing to the officer concerned with specific reference to the sections before starting further work.

Once the work is started no cognizance of any complaint taken. Merely not signing of the level book shall not be deemed as disagreement. The Executive Engineer shall verify leveling work to the extent of 5 percent before commencement of WBM to proper formation and grade till this item is finally measured and accepted by the Department. The measurement shall be taken on compacted WBM. Any crack formation or screenings observed in between layer of WBM work shall be deducted from the measurements so taken and net quantity of WBM work shall be considered for payment.

9. RATE:

- 9.1 The control unit for WBM sub based/base course shall be payment in full for carrying out the required out the required operation including full compensation for all component listed below.
The rate shall be on Cum. Basis.
The payment shall be made on one Cum. Basis of finished work.

The rate shall be for a unit of one Cum

Item No. 105

Providing and laying Controlled Cement Concrete M - 250 for average 200mm thick wearing coat laid as directed including Trimix finishing ,curingcomplete

SCOPE

The work shall consist of construction of unreinforced, dowel joints, plain cement concrete pavement in accordance with the requirements of these specifications and in conformity with the lines, grades and cross sections shown on the drawings. The work shall include furnishing of all plant and equipment, materials and labour and performing all operations in connection with the work, as approved by the engineer.

The design parameter, viz, thickness of pavement slab, grade of concrete, joint details etc. shall be as stipulated in the drawings.

[I] MATERIALS :-

Water shall conform to M-1, Cement shall conform to M-2, Sand shall conform to M-6, Grit shall conform to M-8 and coarse aggregate shall conform to M-12. Super plasticizer shall be of approved quality.

[II] WORKMANSHIP :-

(i) Cutting for sub-base shall be done in proper grade and camber as directed by Engineer-in-Charge. Care must be taken that all slopes are evenly and truly dressed. Cutting shall be done to the exact depth required and shall be as per formation level proper grade and camber as per instruction. Useful stuff shall be carefully stacked separately as directed. The stuff received from the cutting shall be utilized for filling cuts and correcting side slopes with all lead and lifts as directed.

(ii) Sub-base with Crushed Metal & murrum shall be prepared as directed by Engineer-in-Charge.

(iii) For Reinforced Cement concrete specified in Item No. 7 with concrete grade M20 instead of M25 is being placed over the prepared sub-base. The relevant Specification of Item No. 7 (hand book item 9.1 (A)) shall be followed for work required for concreting. Also the super plasticizer shall be added during mixing of concrete as recommended by manufacturer.

(iv) Leveling of the surface is done using TRIMIX surface vibrator. The vibrator runs over channels, placed as per required level and slope and simultaneously level surface of the concrete.

(v) Vacuum dewatering follows the leveling of concrete. The purpose of vacuum processing is to provide quicker setting and high early strength by removing surplus water from the concrete. The process is followed as per instruction of site Engineer-in-Charge & attached guide line.

(vi) Immediately after dewatering, the surface is floated with a skim power floater as per instruction of Engineer-in-Charge. The surface shall be prepared as per requirements and instructions.

For smoother surface requirement, the surface is trowelled with same machine mounted with trowelling blades.

(vii) Construction joints upto $\frac{1}{4}$ of the slab depth are cut afterwards. They give clear and straight theoretical cracking line in the case of unexpected stresses. Groove cutting is done within 48 hours from casting at the floor.

(viii) After surface vibrator and finishing the surface with power floater and trowel light brooming on the surface, expansion joints size 20 x 115mm shall be provided with filling the expansion joint having size 20 x 20mm by using bitumen as per manufacturer's specification and directed by Engineer-in-Charge.

(ix) Making a construction joint by cutting of joints of size 3mm x 20mm by using of concrete cutter machine. Construction joints are filled with Bitumen or an elastomeric cold applied joint sealant, which ensures performance of expected functions at the joints.

(x) Concrete should be cured in normal way (Water ponding) or the surface is covered with a plastic sheet or gunny bags. In any method, the surface should be always kept wet with water. Curing must be done for at least 7 days or as per directed by Engineer-in-Charge.

(xi) The machineries used for the above process shall be of standard technical specification attached separately herewith. (i.e. Surface vibrator, vacuum pump, suction mat top cover, filter pad, skin floater etc.)

(xii) The Workmanship and process for vacuume dewatering, water cement ratio, concrete placing, surface vibration, vacuum processing, floating, Towelling and curing shall be carried out as per specification and as per instruction of Engineer-in- Charge.

[III] MODE OF MEASUREMENT :

- (I) The rates shall include all materials, formworks, machineries and labour charges.
- (II) The rate shall be for a unit of **One Cum**.

Item 106

Road marking with hot applied thermoplastic paints with reflectorizing glass beads on bitumen surface providing and laying a hot applied thermoplastic compound 2.5 mm thick including reflectorizing glass beads @ 250gms per sqm area, thickness of 2.5mm is excluding of surface applied glass beds as per IRC:35-2015. The finished surface to be level, uniform and free from streaks and holes. zebra patta /bump patta lane/center line/ edge line/cut patta. The white color marking should provide luminance coefficient on cement road shall be min 130 mcd/m²/lux and Asphalt road shall be min 100 mcd/m²/lux during the service life during the day time. The marking should meet the performance criteria for night time reflectivity, wet reflectivity and skid resistance as mentioned in the section-15 of IRC 35-2015. Warranty for the Retro reflectivity should be two years.

- 1. General** The color, width and layout of road markings shall be in accordance with the Code of Practice for Road Markings with paints, IRC : 35, and as specified in the drawings or as directed by the Engineer.
- 2. Materials** Road markings shall be of ordinary road marking paint, hot applied thermoplastic compound, or reflectorized paint as specified in the item and the material shall meet the requirements as specified below.

3. Ordinary Road Marking Paint

- 3.1.** Ordinary paint used for road markings shall conform to IS:164.
- 3.2.** The road markings shall preferably be laid with appropriate road marking machinery.
- 3.3.** Laying thickness of road marking paint shall be as specified by the Engineer.

4. HOT APPLIED THERMOPLASTIC ROAD MARKING.

4.1. 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 screened /extruded on 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 color of the compound shall be white or yellow (IS color No. 356) as specified in the drawings or as directed by the Engineer.
- (iv) Where the compound is to be applied to cement concrete pavement, a scaling primer is recommended by the manufacturer, shall be applied to the pavement in advance of placing of the stripes to ensure proper bonding of the compound. On new concrete surface any laitance and/or curing compound shall be removed before the markings are applied.

4.2. Thermoplastic Material

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

4.2.2. Requirements

- (1) **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 900-3 PROPORTIONS OF CONSTITUENTS 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	42.0 Max.	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 requirements of this Specification are met.

II) Properties: The properties of thermoplastic material, when tested in accordance with ASTM D36/BS-3262- (Paint 1), shall be as below:

(a) Luminance:

White: Daylight luminance at 45 degrees - 65 percent min. as per AASHTO M249

Yellow: Daylight luminance at 45 degrees - 45 percent min. as per AASHTO M249

(b) Drying time: When applied at a temperature specified by the manufacturer and to the required thickness, the material shall set to be in traffic in not more than 15 minutes.

(c) Skid resistance: not less than 45 as per BS 6044.

(d) Cracking resistance at low temperature: The material shall show no cracks on application to concrete blocks.

(e) Softening point: 102.5 ± 9.50°C as per ASTM D36.

(f) Flow resistance: Not more than 25 percent as per AASHTO M249.

(g) Yellowness Index (for white thermoplastic paint): not more than 0.12 as per AASHTO M249

(III) Storage life: The material shall meet the requirements of these Specifications for a period of one year. The thermoplastic material must also melt uniformly with no evidence of skins or unmelted particles for the one year storage period. Any material not meeting the above requirements shall be replaced by the manufacturer/ supplier/ Contractor.

(i) Reflectorizing: Shall be achieved by incorporation of beads. The grading and other properties of the beads shall be as specified in Clause 4.3.

(ii) Marking: Each container of the thermoplastic material shall be clearly and indelibly marked with the following information:

1. The name, trademark or other means of identification of manufacturer
2. Batch number
3. Date of manufacture
4. Color (white or yellow)
5. Maximum application temperature and maximum safe beating temperature.

(iii) 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 manufacturers of the thermoplastic material showing results of all tests specified herein and shall certify that the material meets all requirements of this Specification.

4.3. Reflectorizing glass beads

4.3.1. This Specification covers two types of glass beads to be used for the production of reflectorized 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 6.3.

- 4.3.2.** The glass beads shall be transparent, colorless and free from milkiness, dark particles and excessive air inclusions.

These shall conform to the requirements spelt out in Clause 4.3.3.

4.3.3. Specification requirements

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

TABLE 800-4 GRADATION REQUIREMENTS FOR GLASS BEAD

Sieve size	Percent retained	
	Type I	Type 2
1.18mm	0 to 3	----
850 micron	5 to 20	0 to 5
600-do-	----	5 to 20
425-do-	65 to 95	-----
300-do-	----	30 to 75
180-do-	0 to 10	10 to 30
below 180 micron	----	0 to 15

- B. Roundness:** The glass beads shall have a minimum of 70 percent true spheres.
- C. Reflective index:** The glass beads shall have a minimum reflective index of 1.50.
- D. Free flowing properties:** The glass beads shall be free of hard lumps and clusters and shall dispense readily under any condition suitable for paint striping. They shall pass the free flow-test.

4.3.4. Test methods: The specific requirements 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 desiccator's 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 orifices, 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.
- The requirements of gradation, roundness and refractive index of glass beads and the amount of glass beads in the compound shall be tested as per BS 6088 and BS 3262 (Part 1).
- The Contractor shall furnish to the Employer a copy of certified test reports from the manufacturer of glass beads obtained from a reputed laboratory showing results of all tests specified herein and shall certify that the material meets all requirements of this Specification. However if so required these tests may be carried out as directed by the Engineer.

4.4. Application properties of thermoplastic material

- 4.4.1.** The thermoplastic material shall readily get screened / 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.
- 4.4.2.** The material upon heating to application temperatures shall not exude fumes, which are toxic, obnoxious or injurious to persons or property.

4.5. Preparation:

- The material shall be melted in accordance with the manufacturer's instructions in a heater fitted with a mechanical stirrer to give a smooth consistency to the thermoplastic material 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 stated by the manufacturer. The molten material should be used as expeditiously as possible and for

thermoplastic material which has natural binders or is otherwise sensitive to prolonged heating, the material shall not 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.

4.6. Properties of finished road marking

- (a) The stripes shall not be slippery when wet.
- (b) The marking shall not lift from the pavement in freezing weather.
- (c) After application and proper drying, the stripe shall show appreciable deformation or discoloration under traffic and under road temperatures up to 60 degree centigrade.
- (d) The marking shall not deteriorate by contact with sodium chloride, calcium chloride or oil drippings from traffic.
- (e) The stripe or marking shall maintain its original dimensions and position. Cold ductility of the material shall be such as to permit normal movement with the road surface without chopping or cracking.
- (f) The color of yellow markings shall conform to IS Color No. 356 as given in IS:164.

5. Reflectorized Paint

Reflectorized paint, if used, shall conform to the Specification by the manufacturers and approved by the Engineer. Reflectorizing glass beads for reflectorizing paints where used shall conform to the requirement of Clause 4.3.

6. Application

- 6.1. 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.

- 6.2. The thermoplastic material shall be applied hot either by screening 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.

- 6.3. 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 an 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 mono-layer 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 metre area.

- 6.4. 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).

- 6.5. 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 from streaks.

7. Measurements for Payment

- 7.1. The painted markings shall be measured in sq. metre of actual area marked (excluding the gaps, if any).

- 7.2. In respect of markings like directional arrows and lettering, etc., the measurement shall be by numbers.

8. Rate

The Contract unit rate for road markings shall be payment in full compensation for furnishing labour, materials, tools, equipment, including all incidental costs necessary for carrying out the work at the site.

conforming to these Specifications complete as per the approved drawing(s) or as directed by the Engineer and all other incidental costs necessary to complete the work to these Specifications.

Mode of Payment: Payment shall be made on Smt. Basis of work done.

Item No. 111

Providing and fixing cast iron steps of size 500 mm × 150 mm × 22.5 mm including painting with two coats of anti-corrosive paint etc. complete as directed by the Engineer-in-Charge.

1.0 Materials

1.1 Cast Iron Steps:

The steps shall be made of **cast iron of approved quality** and shall be of size **500 mm × 150 mm × 22.5 mm thickness**. The cast iron shall be sound, free from cracks, blow holes, casting defects or any imperfections and shall have uniform thickness and proper shape.

1.2 Paint:

Anti-corrosive paint shall be of approved make and quality suitable for application on cast iron surfaces. The paint shall provide effective protection against rust and corrosion.

1.3 Fixing Materials:

Necessary fixing materials such as **cement mortar, fasteners, clamps or embedding arrangements** shall be of approved quality and suitable for proper installation.

2.0 Workmanship

The cast iron steps shall be **properly aligned and fixed** in position as shown in the drawings or as directed by the Engineer-in-Charge.

The steps shall be embedded firmly in masonry or concrete using suitable **cement mortar or fixing arrangement** to ensure stability and safety. Proper care shall be taken to maintain **uniform spacing, level and alignment** of steps.

Before painting, the surface of cast iron shall be **cleaned thoroughly** by removing dust, grease, rust or loose particles.

The steps shall then be painted with **two coats of approved anti-corrosive paint** uniformly applied to all exposed surfaces. Adequate drying time shall be provided between coats.

The finished work shall be neat, properly aligned and to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

The cast iron steps shall be measured **by number (Each)** of steps fixed at site.

Item No. 112

Providing and fixing decorative entrance gate made out of cast iron and various mild steel tabular section combination , the Ornamental entrance gate should be fixed at compound wall including pattern and die making

,cutting ,welding , grinding, fabrication , fixing in position at compound wall with necessary pedestal, bearing block and other locking arrangement. The entrance gate should be painted with two coats of priming coat of paint, and two coat of oil paint etc complete. As per detail design and instruction of architect.

Providing and fixing decorative entrance gate made out of cast iron and various mild steel tabular section combination.

Mild steel section shall be confirm to IS : 816-1956

The Ornamental entrance gate should be fixed at compound wall including pattern and die making, cutting, welding, grinding, fabrication, fixing in position at compound wall with necessary pedestal, bearing block and other locking arrangement. The entrance gate should be painted with two coats of priming coat of paint, and two coat of oil paint etc. complete. As per detail design and instruction of architect.

Mode of Measurement & Payment:

The Item shall be measured for its Square meter limiting dimensions to those specified on plan or as directed.
The rate shall be for a unit of Kilogram.

The payment will be made on Kilogram basis of the finished work

Item No. 113

Providing andConstructing JUNCTION CHAMBER of size 0.35 x 0.35 x 0.60 m. including connecting rainwater pipes, Half brick work with 15mm thick plaster in C;M 1:4, 50mm thick C.C. 1:2:4 in bed flooring & coveredwith FRPFramewithcover incl.all labour, material ,excavation etc. complete.

1.0 MATERIAL :

Water shall conform to M-1 cement shall conform of M-3 sand M-6 brick M-15 stone agg. 20 mm nominal size M-12.

2.00 WORKMANSHIP :

1.00 The junction chambers shall be constructed of specified size and drawing as directed.

2.00 Excavation shall be conform as per specification book I.No. 4.00 (a) .

2.1 C.C. 1:2:4 shall be conform as per general specification of building book I.No. 5.3.13.

2.2 Half brick masonry in C.M. 1:4 shall be conform as per general specification building book I.No. 6.30 (I) B.2.3 15 mm thick cement plaster shall be conform as per general specification of building book I.No. 17.58 (II) 2.4 Providing 50 mm thick I.P.S. (1:2:4) shall be conform as per general specification of building book I.No. 14.71 (B) .

3.00 MODE OF MEASUREMENT :

3.1 The work shall be measured for finished work.

3.2 The rate includes cost of all materials, labour etc. required for carrying out satisfactory completion of work & testing for function.

3.3 The rate shall be for unit of No Basis.

Item No. 115

Providing & Constructing PERCOLATION SOCKWELL of 2.54 m internal clear diameter and 5.00 mt. depth incl. honey comb brick masonry in C:M 1:C, 15mm thick plaster in C;M 1:4, 50mm thick C.C. 1:2:4 in bed flooring & covered with RCC top slab 100mm thick incl. filling with gravel etc. complete incl. all labour, material ,excavation etc. complete.

The Excavation shall be carried out as per specification 4.00 (A) 4.0.0.1 (A), 4.0.0.2 (A) of Building Specification Book as per detail estimate and drawings. The Various material shall be of approved quality. The work includes supplying of all material, labour and placing of material in pit as per instruction including making bore etc. with all equipment etc. Complete.

The payment shall be made on "No" basis.

Item No. 116**Drilling of 200 mm dia bore hole by DTH rig in rocky formation in All takuka of Zone III (o to 350 Mtr)**

Drilling 200 mm diameter Bore hole up to required depth in over burden strata and 200 mm diameter Bore Hole in remaining rocky strata up to 100/150/200/250 meter depth. The drilling shall be done by the Department as per actual requirement. Carting of pipes etc. shall be carried out by the contractor from source to site of work at his/their own cost.

Drilling work shall be carried out at the sites shown by the Department. The diameter of the hole shall be 200 mm in over burden strata and 200mm diameter in rocky strata up to over all specified depth of 100/150/200/250 meters. The drilling shall be carried out in over burden strata up to land rock met with. If further drilling can not be done over burden or in rocky strata due to mechanical failure up to 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.

Drilling Operation: the drilling operation for construction of tube wells shall be carried out by suitable rig to satisfy the following.

(A)For Drilling Through Rock.

Boring through rock shall be of 200 mm diameter and the depth from the ground level of the bore shall be up to depth specified in the schedule.

The payment shall be made one Rmt basis for actual work done.

Item No. 118**Drilling of 200 / 215 mm dia bore in over burden rocky or loose collapsible / boulder strata and lowering of UPVC / PVC / ERW casing pipe above 12 mt and upto 40 mt depth by DTH rig etc complete**

Drilling 215 mm diameter Bore hole for 175/180 mm diameter E.R.W./P.V.C. pipe up to required depth in over burden strata and 165 mm diameter Bore Hole in remaining rocky strata up to 100/150/200/250 meter depth. The drilling shall be done by the Department as per actual requirement. Carting of pipes etc. shall be carried out by the contractor from source to site of work at his/their own cost.

Drilling work shall be carried out at the sites shown by the Department. The diameter of the hole shall be 215 mm in over burden strata and 165 mm diameter in rocky strata up to over all specified depth of 100/150/200/250 meters. The drilling shall be carried out in over burden strata up to land rock met with. If further drilling can not be done over burden or in rocky strata due to mechanical failure up to 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 175 / 180 mm diameter E.R.W./P.V.C. pipes shall be lowered by the contractor in over burden strata. The contractor as desired by the Engineer-in-charge shall carry out the joining of pipes. If required. Necessary jointing materials steel handed plates etc shall be provided by the contractor at his own cost.

Drilling Operation: the drilling operation for construction of tube wells shall be carried out by suitable rig to satisfy the following.

(A)For Drilling Through Over Burden.

1. The diameter of the bore in the over burden shall be sufficient for insertion of 175/180 mm diameter casing pipe with joints and leaving sufficient annular space for outing the casing pipe with sticky clay or local soil etc.

2. The boring in embedded in the over burden shall be continued through the rocky strata at least upto 0.15 meter so that casing pipes can be properly embedded in the rock formation.

3. After casing pipes in embedded in the rock the same is to be grouted with materials like sticky clay etc. So as to avoid leaking of drain water in the bore. After completion of drilling work bore shall be clean air compressor upto the availability sand free discharge or at least for one hour which ever is earlier & yield test should be taken with 90'

'V' notch in presence of the authorized representative of the department. In any case the decision of the department will be final and binding to contractor and extra payment will not be paid for the same.

(B) For Drilling Through Rock.

Boring through rock shall be of 165 mm diameter and the depth from the ground level of the bore shall be up to depth specified in the schedule.

The payment shall be made on Rmt basis for actual work done.

Item No. 119

Providing and fixing bail plug (Bottom Cap) Suitable for 200mm dia. Pipe

Bore plug having 100 mm height and shall be made from M.S. plate 5 mm thick with 3 equal distance holes on circumferences for nuts bolts locking arrangement. It shall be suitable for 200 diameter ERW pipe in the top of the plug bore plug. 2 mm M.D. plate shall be welded with bore plug Necessary nuts and bolts shall have required size and threads. Bore plug thickness shall be minimum of 5 mm.

The payment shall be made on unit Number basis.

Item No. 120

Heavy duty clamp made from 4" x 1.5" iron strip suitable for column pipe 1.5" to 2" length.

(C) 65mm (2.1/2") dia. Pipe

Heavy curve clamps of 50 mm x 75 mm x 10 mm shall have to providing nuts and bolts. The bore clamp shall be with 3 holes. The clamps shall be got approved from the Engineer-in-charge or work before used. The rate shall include the cost of materials and labour required for this item.

The payment shall be made on Pair basis.

Item No. 121

Supplying & erecting G.I. bend for pipe connections suitable for (E) 65 mm (2.5")

The 65mm G.I. bend shall be of standard size and shall medium grade. It shall be from R36 bend and shall be suited for delivery pipe of 50 mm size.

The payment shall be made on completion work.

The rate shall be for a unit of one number basis

Item No. 122

Supplying, & erecting C.I. swing, check type non-return (Reflux) Valve -ISI marked suitable for 65 mm dia. pipe.

Cast iron Reflux valve confirming to I.S. 780-1984 of its latest revision with I.S.I. marking suitable size of 65 mm diameter. The valve I.S. 780 shall be good and approved quality and its shall be 65 mm diameter. If any defect observed during contractor shall replace the fixing and testing it without claiming any extra cost.

The payment shall be made on completion work.

The rate shall be for a unit of one number basis.

Item No. 123

Providing & Supplying of ISI marked HDPE Pipe suitable for potable water as per IS specifications no 4984/1995 including all taxes, transportation, freight charges, inspection charges, loading, unloading along with lowering and laying the pipe including the cost of all labour & material for 63mm dia 10.00 kg/cm² pipe.

The work shall be carried out as per Instruction of Engineer in charge and 63mm H.D.P.E. Pipes (IS:4984/1985 with latest amendment) having material Grade PE-80 shall be supplied shall conformed to I.S. with SS-316 Nipple at both end having 11 TPI thread in shall be I.S.I. make and shall got approved by Engineer in charge.

Lowering and the fixing of housing and casing pipes shall be carried out in best workmanship. The contractor shall be responsible for workman compensation in case of any accident. In case of dispute or over looked items the decision of the Executive Engineer shall be final and binding to the contractor.

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

ISSUE OF MATERIALS AND TRANSPORT :-

The casing pipes for insertion in over burden and other materials shall be brought by the contractor. Transportation and loading and unloading of pipes and any other materials will be made by contractor without any extra charge.

The measurement shall be taken on Rmt. basis.

Payment shall be made on one Rmt. basis.

Item No. 124

Geohydrological ground water investigation including vehicle charges (b) For three phase DTH bore/ DR tube well including water sample testing charges.

The contractor should inform well in advance to Engineer in charge for the above test after completion of 200 mm dia pilot bore hole.

In no case logging test in pilot bore hole exceeding 250 mm dia size shall be carried out. The logging electrode must reach at specified depth of bore hole as stated in the schedule. Otherwise logger operator can ask for cleaning the bore hole again and second time logging test should be carried out. The charge for second time logging should also be recovered from the contractor as the fall depth of bore hole could not be logged due to not having smooth and clean bore hole as certified by in charge logger operator (Hydrologist/Jr. Geologist).

In case of drilling area having sticky/plastic lay strata contractor has drilled pilot bore of 250 mm dia R.C. Bit for successful logging operation. Even if the logging is not possible in 200 mm dia. because of expanding nature of lay, the agency is not required to pay the re-logging charges.

The payment has to be done as per No completed.

Item No. 125

Trenching in ordinary / Hard soil up to a depth of 60 cm including removal and stacking of serviceable materials and then disposing of surplus soil, by spreading and neatly levelling within a lead of 50 m and making up the trenched area to proper levels by filling with earth or earth mixed with sludge or / and manure before and after flooding trench with water (including cost of imported earth, sludge or manure)

1 WORKMANSHIP

The size of pits is 100x100x100 cm carried out as per instruction of department. Black cotton soil shall be spread into the pits plantation of trees shall be done in the centre of pits. Necessary fertilizers shall be spread in the pits. Finally black cotton soil is spread as required surrounding to plant upto 15 cm down from

original ground for store of water surrounding plants. Care should be taken to plants during the execution of work and shall be prevented from cow, buffalo, goat etc. by providing MS jail guard and agency should be responsible for it.

2 MODE OF MEASUREMENT AND PAYMENTS

- 2.1 The rate inclusive of any cost of all materials and labours for complete items. The rate also include cost of organic fertilizer, plants of trees.
- 2.2 The rate shall be for a unit of One No.

Item No. 126

Providing and fixing M. S. tree guard 50 cm square in plan, height 1.40 metre above ground level and 0.50 metre below ground level. The vertical members shall consist of four nos of angle iron of size 20x20x4 mm 1.9 long, one at each corner and 8 nos flat iron of size 25x4 mm 1.4 long. The vertical members shall be welded to 4 nos 25x4 mm M. S. flats placed horizontally around the vertical member of the cage. One name plate of 1mm thick M.S. sheet of size 250x100 mm shall be welded to the tree guard near the middle height and lettered CPWD / PWD / any other approved name. The tree guard shall be fixed to the ground by making suitable holes and by embedding four corners leg in the ground, including refilling the earth, compaction etc. complete. The tree guard shall be painted with two coats of paint of approved brand and manufacture over a coat of primer, complete in all respect.

1.0 MATERIAL:

- I 50x50mm 10 gauge welded steel mesh of Best Quality and approved make and shall conform to M-34
- II M.S. Angle and Flat of Best Quality and shall conform to M-22
- II Oil painting as per I.No. 19.7 P.No: 122 of General Specification book
- IV Primer coat as per I.No 19.2 P.No 121 of General Specification.

2.0 WORKMANSHIP

1.40 Mt. height and 50 cm diameter around Tree guard shall be prepared as per the drawings or as directed by using 20mm x 20mm x 4mm size vertical M.S. Angle and 50x50mm 10 gauge welded steel mesh framing on 25x4mm M.S. flats and 250x100mm MS sheet name plate as per design and directed Engineer-in-charge. All the members shall be free from decayed, rusts, straight and smooth face and jointed with each other at right angle. Any excessive spots of welding shall be removed from frame by grinding to make joint corners smooth. The work shall be followed as per relevant specification of Item No. 10.102 and 11.4-A of General specification book volume I. One coat of primer and two coats of oil painting shall be applied as per General specification book I.No: 19.2 + 19.7 of General specification book volume I

Fixing of Tree guards shall be done in campus as per instruction given by Engineer in charge.

3.0 MODE OF MEASUREMENT AND PAYMENT

- 3.1 The rate shall include cost of all materials and all labour involved to complete this work. It also include tools, plants, welding machine, scaffolding, coat bolts and primer and oil painting. This shall also including conveyance, and delivery, handling, loading, unloading etc. complete.

- 3.2 The rate shall be for a unit of One No.

Item No. 127

Supplying, Providing & Fixing of Precast benches of Cement concrete, top covered with a layer of Latest Mosaic chippings/ tiling shade as directed by Engineer -in- Charge with specified " Name plate" casted with, at the time of the manufacture of benches, as directed, cured, rubbed and polished properly, Transporting at site and fixing the bench on two leg pedestal of Precast C.C. with necessary, excavation, PCC, Fixing pedestals & Fixing precast benches in line and levels with jointing material etc. comple.

Materials :

The material shall be used as per the general specifications.

Cement Concrete Grade is 1:3:6 as per Specification of Building Booklet Item No 5.3.14(A)/Page No 38

Workmanship :

Workmanship shall be as per description given above and Design approved by engineer in charge

Mode of Measurement and Payment. :

The rate shall include cost of all materials and labour required for satisfactory completion of this item as directed above.

The work shall be measured for the finished work.

The rate shall be for a unit of Nos.

**Deputy Executive Engineer
Dist.R & B Sub-Division**

Jetpur

**Executive Engineer
Dist. R& B Division**

Rajkot