

Contract No.:

GOVERNMENT URBAN DEVELOPMENT COMPANY LIMITED

GANDHINAGAR

[A WHOLLY OWNED GOVERNMENT OF GUJARAT UNDERTAKING]



BIDDING DOCUMENT FOR

**PROPOSED 2-LANE RAILWAY OVER BRIDGE IN LIEU OF LC. NO. 48A BETWEEN RLY KM. 629/3 TO 629/4,
NEAR DHRANGADHRA RLY. STATION, DHRANGADHRA.**

VOLUME – II

PART-I (TECHNICAL SPECIFICATION)

GOVERNMENT OF GUJARAT

By

Vice President (Project)

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(Through e- Procurement Portal only - <https://gudctender.nprocure.com/>)

TECHNICAL SPECIFICATIONS FOR SPECIALIZED CONSERVATION WORKS

The specifications in general for this bridge are as per MORT&H fifth revision. In case of any ambiguity or discrepancy MORT&H specification shall govern.

Item No.	Item Description	Specification as per MORT&H
1	Excavation for foundation in sand , gravel, clay soft soils and murrum etc. including shoring, strutting dewatering as necessary and disposing of the excavated stuff as directed.(A) Depth upto 3.0 M. and lead upto 100m for 10 Cum (For Railway Pier).	Relevant Specifications of MORT&H fifth revision Section – 304 shall apply to this item.
2	Excavation in large boulders and soft rock by welding including shoring, strutting and dewatering as necessary and disposing of the excavated stuff as directed (For Railway Pier).	Relevant Specifications of MORT&H fifth revision Section – 300 shall apply to this item.
3	Providing and filling in foundation with ordinary Cement concrete M-15 mix and providing necessary vertical pin headers including formwork, vibrating, ramming and curing complete (For Railway Pier).	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700 & 2100 shall apply to this item.
4	Providing and Casting in situ Controlled Cement Concrete M35 for R.C.C. Raft footing and cutt-off walls including necessary shuttering laying, vibrating, ramming and curing complete (For Railway Pier).	Relevant Specifications of MORT&H fifth revision Section –1500, 1700 & 2100 shall apply to this item.
5	Providing and placing in position FE 550D (With CRS) TMT bar reinforcement for following items including cutting bending hooking and tying complete as per detailed drawing.For RCC Railway Pier Raft & Open foundation.	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
6	Providing and filling trenches of Labour charges - Excavator in rocky strata with ordinary cement concrete M-15 (For Railway Pier).	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700 & 2100 shall apply to this item.
7	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 (For Railway Pier).	Relevant Specifications of MORT&H fifth revision Section – 304 shall apply to this item.
8	Providing and casting in situ controlled cement concrete M-35 for R.C.C. return as per drawings including centering shuttering, scaffolding where necessary, laying vibrating, curing and finishing complete. (1) Piers (2) Abutment (3) RCC return (A) Height Upto 5.0 M.	Relevant Specifications of MORT&H fifth revision Section –1500, 1700 & 2200 shall apply to this item.
	(B) Height 5.0M to 10.0M	
	(C) Height 10.0M to 15.0M	
9	Providing and laying in position FE 550D (With CRS) TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) Piers	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
10	Providing and laying in situ machine mixed controlled M-35 grade cement concrete for RCC caps , side walls, tie walls etc. including M:40 pedestals over piers and abutments including necessary scaffolding formwork, centering, transporting, placing, compacting by mechanical vibrators,	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700 & 2200 shall apply to this

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	finishing and curing and casting, finishing at any height or depth as per drawing etc. complete excluding reinforcement, as directed by Engineer and as per specification.	item.
	Pedestals in M:40	
	Seismic Restrainer in M:40	
11	Providing & fixing in position (Thermo mechanically treated bars) FE 550D (With CRS) TMT bar steel bars of various diameters for all RCC works in Foundations, Pier, Abutment wall, box wall, Abt. cap, Dirt wall, side wall, Retaining wall, Pedestals as per detailed design & drawings and schedule including cutting, bending, hooking the bars, binding with 18 SWG GI wires and supporting as required with all lifts and leads etc. complete including cost of all labour, materials, tools, plants, equipments etc. all complete as directed by Engineer and as per specifications.	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
12	Providing and applying anti carbonation, anti fading, mold resistant, heat insulating, and 100% acrylic breathable decorative external waterproof coating of approved shade having Viscosity @ Room Temperature by Ford cup No. B-4 (dilute 2 parts of product with 1 part of water) 18 to 30 sec. pH of 7.00 to 10.00 and Sp. Gravity @ Room Temperature 1.30+0.1, tested for carbon dioxide diffusion resistance properties for coating materials and coating systems for open atmosphere surface of substructure as well as superstructure as per DIN EN 1062-6 (2002-2010) by a NBA Grade "A" accredited institution (For Railway Pier).	As per item Description & as Directed by Engineer in charge.
13	Design, supply, fitting and fixing in position true to line and level POT-PTFE bearing of 250 MT Capacity, consisting of a metal piston supported by a disc or un reinforced elastomer confined within a metal cylinder, sealing rings, dust seals, PTFE surface sliding against stainless steel mating surface, complete assembly to be of cast steel / fabricated structural steel, metal and elastomer elements complete as per IS:2062, IS:1030, AISI:304, AISI:316, IS:6911, BS:3784, IS:3400, IS:226, BS-5400, Bridge Code and as per approved drawing and Technical Specifications. The design of the bearings shall be submitted by the manufacturers / contractor and got approved from Railway before fixing. Test report after inspection of the bearings shall be submitted and got approved before the materials are lifted from the manufacturer premises.	Relevant Specifications of MORT&H fifth revision Section –2000 & 2006 shall apply to this item.
	POT-cum -PTFE Bearing (Free end)	
	POT Bearing-Fixed Type	
	POT-cum -PTFE Guided (L)Bearing	
	POT-cum -PTFE Guided (T)Bearing	
14	Providing and fixing mild steel dowel bars of minimum 32 mm dia. For anchoring by drilling holes in foundation strata including necessary bending, hooking of dowel bars and grouting the holes complete as per detailed drawing and as directed (For Railway Portion).	As per IS 1786 Specification & relevant MORT&H fifth revision section 1600 shall apply to this item.
15	Providing and Casting in situ controlled cement concrete M 40 for R.C.C. Deck Slab including centering, scaffolding , curing and finishing complete (For Railway Portion).	Relevant Specifications of MORT&H fifth revision Section –1500, 1700 & 2300 shall apply to this item.
16	Supplying, fabrication, assembling of all types of steel girders of specified spans with structural steel conforming to Quality "B0" Grade Designation E250 conforming to IS:2062, erection / slewing / end launching of steel	Relevant Specifications of MORT&H fifth revision Section –1900 and RDSO

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	<p>girders with cranes or any other approved launching methods as per site conditions (not requiring traffic block) on substructure including provision of trolley refuges etc., complete as per approved QAP and drawings conforming to IRS-B1-2001 and other relevant codes and specifications.</p> <p>Note:1. Detailed fabrication and erection drawings & launching methodology will be prepared by the contractor and got approved from Railway.2. The rate is all inclusive including launching in position, complete in all respect except cost of (i) Painting / Metalising; (ii) Bearings & (iii) HSFG bolts which shall be paid extra under relevant item.3. The payment shall be made on the theoretical weight of main components and gusset plates only.4. Payment Schedule:(i) Receipt of material at site: 40%(ii) Fabrication of girders: 20%(iii) Erection/Launching: 20%(iv) Completion in all respects: 20%</p> <p>Plate Girder/Semi Through Girder/Composite Girder (Steel Work) (Composite steel girder of span length above 36.0m)</p>	specification shall apply to this item.
17	Extra for using steel conforming to Grade Designation E350 instead of Grade Designation E250 of Quality "B0" as per IS: 2062	
18	Supplying and fixing HSFG bolts of any dia and any length with suitable nuts including DTI washers conforming to IRS-B1-2001 for bridges and steel structures with contractors labour, tools and plants and lead and lift etc., complete.	Relevant Specifications of MORT&H fifth revision Section –1900 and RDSO specification shall apply to this item.
19	Metallizing of steel work of girders with sprayed aluminium after surface preparation by Sand/grit blasting, followed by one coat of etch primer (IS:5666) & one coat of Zinc Chrome primer (IS:104) and two coats of aluminium paint (IS:2339) with all labour, T&P and material as a complete job duly conforming to all relevant specifications and process given under Clause 39 of IRS-B1-2001. Note: Nominal Thickness of sprayed Aluminium coating shall be 150 microns. DFT of Zinc chrome primer shall be 25-30 microns and DFT of each coat of Aluminium paint shall be 12-14 microns.	Relevant Specifications of MORT&H fifth revision Section –1900 and RDSO specification shall apply to this item.
20	Providing and placing in position FE 550D (With CRS) TMT. Bar reinforcement including, cutting, bending hooking and tying complete as per detailed drawings.(I) Solid Slab.(II) Deck Slab.	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
21	Providing and casting RCC in M-40 controlled concrete Crash Barriers as per detailed drawings including necessary scaffolding, centering, formwork, mixing in machine, transporting, placing, compacting, finishing, curing, etc. complete including providing and fixing of inserts if any with all leads and lifts as per drawing & specification and as directed by Engineer, excluding reinforcement (For Railway Portion).	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700, 2700 shall apply to this item.
22	Providing and laying precast RCC footpath slab in controlled cement concrete of M:20 grade (7 cm thickness including necessary reinf.) and providing and setting cement chequered tiles in C.M. 1:5 as per drawing including necessary formwork, cutting and finishing complete.	Relevant Specifications of MORT&H fifth revision Section – 410 shall apply to this item.
23	Providing and fixing post and pipe railing as per detailed drawing including 3 coats of painting to steel works complete.	Relevant Specifications of MORT&H fifth revision Section –810 shall apply to this item.

Item No.	Item Description	Specification as per MORT&H
24	Providing and fixing in position (Thermo mechanically Treated bars) FE 550D (With CRS) TMT bar reinforcing bars of various diameters for the Crash Barrier as per detailed designs and drawings and schedule including cutting, bending, hooking the bars, binding with 18 SWG GI wires with cost of all labour, materials, tools, plants, equipments, supporting as required with all lifts and leads etc. all complete as per specification and as directed by Engineer.	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
25	Providing and laying Double Walled corrugated Pipes (DWC) of Polyethylene (conforming to IS:14930-II) of 50mm O.D. / 38mm I.D. with fittings and necessary connecting accessories of same material at required depth for laying cable below footpath slab etc. complete as per specification and as directed by Engineer (For Railway Portion).	As per IS 4985 Specification and item Description as Directed by Engineer in charge.
26	Providing and fixing 100 mm dia. G.I. Drainage spouts , as per MOST Drg. No SD/303 including grating with suitable clean out fixtures including all leads and lifts etc. complete as per specification, design & drawings and as directed by Engineer (For Railway Portion).	Relevant Specifications of MORT&H fifth revision Section – 2705 shall apply to this item.
27	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.(For Downtake / longitudinal runner pipe (For Railway Portion))	Relevant Specifications of MORT&H fifth revision Section – 2700 shall apply to this item.
28	Painting Two Coats on New Concrete Surfaces (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces) - For inner face of crash barrier of Railway Portion	As per item Description & as Directed by Engineer in charge.
29	Providing and applying one coat Epoxy Phenolic primer of DFT 50 micron and two coats of Epoxy Phenolic coating of DFT 100 microns each or any other equivalent epoxy coating system to all concrete surfaces exposed to atmosphere in substructure including cost of material, labour, transportation, scaffolding and preparing the surfaces by cleaning, washing, brushing, sand / grit blasting etc. complete and as directed by Engineer and as per specification. (Paint shall be got approved from Engineer and tested from approved laboratory). (For Railway Portion).	As per item Description & as Directed by Engineer in charge.
30	Supplying, Fabricating and fixing access ladders, inspection platforms on bridges with structural steel conforming to IS:2062 including welding / bolting, priming painting with one coat of ready mixed paint of Zinc Chromate (IS:104) with DFT of 25-30 microns followed by one coat of Zinc Chrome Red Oxide (IS:2074) with DFT of 25 microns with all material, labour, T&P as a complete job as directed by Engineer-in Charge.	Relevant Specifications of MORT&H fifth revision Section –1900 and RDSO specification shall apply to this item.
31	Providing and casting in situ controlled cement concrete M-40 for average 100 mm thick wearing coat laid as directed including tamping, vibrating, finishing, curing and filling joints with bitumen complete.	Relevant Specifications of MORT&H fifth revision Section – 1000, 1500, 1700 & 2700 shall apply to this item.

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32	Providing and fixing in position FE 550D TMT (with CRS) bar reinforcement including cutting, bending and tying complete as per detailed drawings. (A) R.C.C. Wearing coat . (upto 10 ton)	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
33	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 @ 250 gms per sqm area, thickness of 2.5 mm is excluding of surface applied glass beads as per IRC: 35-2015. The finished surface to be leveled, uniform and free from streaks and holes. Zebra patta/bump patta lane/centre line/edge line/cut patta. The white colour marking should provide luminance coefficient on cemented road shall be 130 mcd / m ² / lux and asphalt roads shall be minimum 100 130 mcd / m ² / 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 (For Railway Portion).	Relevant Specifications of MORT&H fifth revision Section – 800 & and latest GR of R&B Department as per SOR/ 1018/715/ C-1 shall apply to this item.
34	Cat Eye / Road Stud / RPM: Supplying of Molded Twin Shanks Raised Pavement Markers made of polycarbonate and ABS moulded body and reflective panels with Micro prismatic lens (No Glass bead lens) capable of providing total internal reflection of the light entering the lens face and shall support a load of 13635 kgs. tested in accordance to ASTM D 4280 Type H and complying to Specifications of Category A of MORTH Circular No RW/NH/33023/10-97 – DO III Dt 11.06. 1997. The height, width and length shall not exceed 20 mm, 130 mm and 130 mm and with minimum reflective area of 13 Sqcm on each side and the slope to the base shall be 35 +/- 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 +/- 2 mm and height not less than 30+/- 2 mm) from the body is to be a minimum value of 500 Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and The color of the marker should be as per the IRC 35-2015 and as directed by Engineer-in-charge (For Railway Portion).	Relevant Specifications of MORT&H fifth revision Section – 800 shall apply to this item.
35	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.	Relevant Specifications of MORT&H fifth revision Section – 201 shall apply to this item.
36	Demarkation of road alignment including marking out road line by providing and fixing wooden pegs or steel rod of required size at every 25 M to 50 M including excavating trenches on both sides of 0.30 m x 0.30m including supplying of labours and all materials for every work etc complete.	Relevant Specifications of MORT&H fifth revision Section – 109 shall apply to this item.
37	Dismantling the existing structure including removing and stacking the dismantled materials as and where directed - RCC work & Rubble Masonry	Relevant Specifications of MORT&H fifth revision Section – 202 shall apply to this item.
	(A) RCC work	
	(B) Rubble / brick masonry	
	(C) Structural steel work	
38	Dismantling of flexible pavements and disposal of dismantled materials with all leads and lifts ,stacking serviceable and unserviceable materials. By Mechanical means.	Relevant Specifications of MORT&H fifth revision Section – 202 shall apply to this item.
39	Dismantling of Cement Concrete Pavement (Dismantling of cement	Relevant Specifications of

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	concrete pavement by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately)	MORT&H fifth revision Section – 202 shall apply to this item.
40	Providing and fixing pre-cast concrete kerb stone of gray cement based concrete block 30 cm length, 30 cm height and 15 cm thick of M250 grade concrete as per approved design & including excavation for fixing in proper line and level, filling the joint with C:M 1:3 (1 cement : 3 fine sand) etc complete. (In underspace portion & beside drain)	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700 & 2100 shall apply to this item.
41	Excavation for foundation in sand, gravel, clay soft soils and murrum etc. including shoring, strutting dewatering as necessary and disposing of the excavated stuff as directed.(A) Depth upto 3.0 M. and lead upto 100m for 10 Cum (For Pier & Abutment Footing)	Relevant Specifications of MORT&H fifth revision Section – 304 shall apply to this item.
42	Excavation in large boulders and soft rock by welding including shoring, strutting and dewatering as necessary and disposing of the excavated stuff as directed. (For Pier & Abutment Footing)	Relevant Specifications of MORT&H fifth revision Section – 300 shall apply to this item.
43	Providing and filling in foundation with ordinary Cement concrete M-15 mix and providing necessary vertical pin headers including formwork, vibrating, ramming and curing complete. (For Pier & Abutment Footing)	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700 & 2100 shall apply to this item.
44	Providing and Casting in situ Controlled Cement Concrete M35 for R.C.C. Raft footing and cutt-off walls including necessary shuttering laying, vibrating, ramming and curing complete. (For Pier & Abutment Footing)	Relevant Specifications of MORT&H fifth revision Section –1500, 1700 & 2100 shall apply to this item.
45	Providing and placing in position FE 550D (With CRS) TMT bar reinforcement for following items including cutting bending hooking and tying complete as per detailed drawing.For RCC Pier & Abutment Raft & Open foundation.	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
46	Providing and filling trenches of Labour charges - Excavator in rocky strata with ordinary cement concrete M-15. (For Pier & Abutment)	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700 & 2100 shall apply to this item.
47	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 (For Pier & Abutment).	Relevant Specifications of MORT&H fifth revision Section – 304 shall apply to this item.
48	Carting of excavated material such as murrum, earth, kapachi, gravel, brickbats, kankar, debris, sand, dismantled material, including loading, unloading, stacking etc. complete at non objectional place as directed by engineer in charge (For Pier & Abutment).	Relevant Specifications of MORT&H fifth revision Section – 304 shall apply to this item.
	Lead up to 3 Km	
	Additional rate for lead above 3 and upto 5 km	
	Additional rate for lead above 5 and upto 10 km	
49	Providing and casting in situ controlled cement concrete M-35 for R.C.C.	Relevant Specifications of

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	return as per drawings including centering shuttering, scaffolding where necessary, laying vibrating, curing and finishing complete. (1) Piers (2) Abutment (A) Height Upto 5.0 M.	MORT&H fifth revision Section –1500, 1700 & 2200 shall apply to this item.
	(B) Height 5.0M to 10.0M	
50	Providing and laying in position FE 550D (With CRS) TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) Piers (B) Abutments	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
51	Providing and laying - Fitter Media 600mm thick directed at the back of abutments as per detailed specifications.	Relevant Specifications of MORT&H fifth revision Section –2504 shall apply to this item.
52	Providing and filling sand behind abutments and between returns in layers as directed by Engineer In-charge (For Abutment).	As per item Description & as Directed by Engineer in charge.
53	Providing & laying weep hole in Abutments, and returns by using A.C. pipe of 100 mm including laying in proper grade and jointing the completed as per detailed specification (For Abutment).	Relevant Specifications of MORT&H fifth revision Section –2706 shall apply to this item.
54	Supplying and laying of bi-axial extruded high modulus polypropylene geogrid having minimum layer coefficient ratio as 1.3, junction efficiency not less than 90% and with 38 mm x 38 mm mesh opening. The roll size shall be 50.0 x 3.95 m, at easily accessible location including top and bottom, with all leads and lifts, manpower and machinery, materials, labour etc. complete and as directed by Engineer - in - charge (For Abutment).	Relevant Specifications of MORT&H fifth revision Section – 703 shall apply to this item.
55	Providing and laying in situ machine mixed controlled M-35 grade cement concrete for RCC caps, side walls, tie walls etc. including M:40 pedestals over piers and abutments including necessary scaffolding formwork, centering, transporting, placing, compacting by mechanical vibrators, finishing and curing and casting, finishing at any height or depth as per drawing etc. complete excluding reinforcement, as directed by Engineer and as per specification.	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700 & 2200 shall apply to this item.
	Pedestal in M40 grade conc.	
	Seismic Restrainer in M40 grade conc.	
56	Providing and laying in position FE 550D (With CRS) TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed for the following. (A) Abutment cap & Dirt wall. (B) Pier Cap.	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
57	Providing and applying anti carbonation, anti fading, mold resistant, heat insulating, and 100% acrylic breathable decorative external waterproof coating of approved shade having Viscosity @ Room Temperature by Ford cup No. B-4 (dilute 2 parts of product with 1 part of water) 18 to 30 sec. pH of 7.00 to 10.00 and Sp. Gravity @ Room Temperature 1.30+0.1, tested for carbon dioxide diffusion resistance properties for coating materials and coating systems for open atmosphere surface of substructure as well as superstructure as per DIN EN 1062-6 (2002-2010) by a NBA Grade "A" accredited institution (For Substructure).	As per item Description & as Directed by Engineer in charge.
58	Art painting work over various components of ROB / FOB / Underpass with three coat water coat putty of approved brand after duly rubbing the surface to make the surface even and smooth. The work includes one coat	As per item Description & as Directed by Engineer in charge.

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	of exterior primer coat of approved brand and three or more coat of exterior plastic emulsion paint of approved brand over the prepared surface. Over this art painting work to be done as per direction and design pattern approved by Engineer-incharge. The work includes the cost centering, shuttering, scaffolding and clearing the site properly after completion of work. The work also includes the cost of all material, manpower, stencils etc. required for art painting. (A) Pier / Abutment & Pier Cap / Abutment Cap"	
59	Providing and fixing in position fully moulded restrained elastomeric Bearings as per detailed drawings.	Relevant Specifications of MORT&H fifth revision Section –2005, 2007 to 2010 shall apply to this item.
60	Providing and fixing mild steel dowel bars of minimum 32 mm dia. For anchoring by drilling holes in foundation strata including necessary bending, hooking of dowel bars and grouting the holes complete as per detailed drawing and as directed.	As per IS 1786 Specification & relevant MORT&H fifth revision section 1600 shall apply to this item.
61	Providing and casting in-situ or precast controlled cement concrete M 50 for prestressed concrete work in super structure including centering, shuttering, curing, scaffolding ramming, vibrating, finishing, launching or shifting complete. (II) Deck Slab. (III) Main Girders. (IV) Diaphragm or cross girder.	Relevant Specifications of MORT&H fifth revision Section –1500, 1700 & 2300 shall apply to this item.
62	Providing and placing in position FE 550D (With CRS) TMT. Bar reinforcement including, cutting, bending hooking and tying complete as per detailed drawings.(I) Solid Slab. (II) Deck Slab.	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
63	Providing and placing in position FE 550D (With CRS) TMT Bar reinforcement including , cutting, bending hooking and tying complete as per detailed drawings.(I) Main Girders. (II) Diaphragm or cross girder.	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
64	Providing and fixing in position to exact profile High tensile steel wires 12.7/15.2mm dia of required ultimate strength conforming to low Relaxation Prestressing steel strands including bending, cutting, tying providing necessary standards as per IS 14268 and anchorages, sheathing (HDPE), stressing, grouting, ducts as per detailed drawing including necessary plant and machinery complete.	Relevant specifications as per IS 1786 Specification & as per relevant MORT&H fifth revision section-1800 specification shall apply to this item.
65	Providing and carrying out load test on bridge deck with simulated loading including provision, placing and removal of loading, supplying, fixing and removing deflection measuring instruments etc. complete with platforms for fixing the instruments etc. complete as per the details supplied and specification and as directed by Engineer and including submission of required results in triplicate after satisfactory completion of the load test.	Relevant Specifications of MORT&H fifth revision Section Cl. No. 2000 IRC SP:51
66	Providing and applying anti carbonation, anti fading, mold resistant, heat insulating, and 100% acrylic breathable decorative external	As per item Description & as Directed by Engineer in

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	waterproof coating of approved shade having Viscosity @ Room Temperature by Ford cup No. B-4 (dilute 2 parts of product with 1 part of water) 18 to 30 sec. pH of 7.00 to 10.00 and Sp. Gravity @ Room Temperature 1.30+0.1, tested for carbon dioxide diffusion resistance properties for coating materials and coating systems for open atmosphere surface of substructure as well as superstructure as per DIN EN 1062-6 (2002-2010) by a NBA Grade "A" accredited institution (For Superstructure).	charge.
67	Art painting work over various components of ROB / FOB / Underpass with three coat water coat putty of approved brand after duly rubbing the surface to make the surface even and smooth. The work includes one coat of exterior primer coat of approved brand and three or more coat of exterior plastic emulsion paint of approved brand over the prepared surface. Over this art painting work to be done as per direction and design pattern approved by Engineer-incharge. The work includes the cost centering, shuttering, scaffolding and clearing the site properly after completion of work. The work also includes the cost of all material, manpower, stencils etc. required for art painting. (A) Outer Face of Crash Barrier	As per item Description & as Directed by Engineer in charge.
68	Providing and casting RCC in M-40 controlled concrete Crash Barriers as per detailed drawings including necessary scaffolding, centering, formwork, mixing in machine, transporting, placing, compacting, finishing, curing, etc. complete including providing and fixing of inserts if any with all leads and lifts as per drawing & specification and as directed by Engineer, excluding reinforcement. (For Approach Viaduct Portion)	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700, 2700 shall apply to this item.
69	Providing and fixing RCC M:25 architectural pylons at end of approach structures including all materials, labour, reinforcement laying, ramming, curing etc. complete as per detailed working drawing.	Relevant Specifications of MORT&H fifth revision Section – 1500 & 1700 shall apply to this item.
70	Providing and fixing marble slab including engraving and painting complete. (i) Size 75cm x 60cm x 4cm.	As per item Description & as Directed by Engineer in charge.
71	Providing and fixing in position FE 550D (With CRS) TMT bar reinforcement including cutting, bending and tying complete as per detailed drawings.(A) Crash Barrier , (B) Wearing Coat , (C) Architectural pylons	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
72	Providing and laying Double Walled corrugated Pipes (DWC) of Polyethylene (conforming to IS:14930-II) of 50mm O.D. / 38mm I.D. with fittings and necessary connecting accessories of same material at required depth for laying cable below footpath slab etc. complete as per specification and as directed by Engineer. (For Approach Viaduct Portion)	As per IS 4985 Specification and item Description as Directed by Engineer in charge.
73	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	Relevant Specifications of MORT&H fifth revision Section – 2700 shall apply to this item.

Item No.	Item Description	Specification as per MORT&H
	all materials.(For Downtake / longitudinal runner pipe for approach viaduct portion)	
74	Providing and fixing 100 mm dia. G.I. Drainage spouts , as per MOST Drg. No. SD/303 including grating with suitable clean out fixtures including all leads and lifts etc. complete as per specification, design & drawings and as directed by Engineer (For approach viaduct portion).	Relevant Specifications of MORT&H fifth revision Section – 2705 shall apply to this item.
75	Strip seal expansion joint (Providing and laying of a strip seal expansion joint catering to maximum horizontal movement up to 70 mm,complete as per approved drawings and standerd specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.)	Relevant Specifications of MORT&H fifth revision Section – 2600 shall apply to this item.
76	Painting Two Coats on New Concrete Surfaces (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces) - For inner face of crash barrier of approach viaduct portion	As per item Description & as Directed by Engineer in charge.
77	Providing and casting in situ controlled cement concrete M-40 for average 100 mm thick wearing coat laid as directed including tamping, vibrating, finishing, curing and filling in joints with bitumen complete.	Relevant Specifications of MORT&H fifth revision Section – 1000, 1500, 1700 & 2700 shall apply to this item.
78	Providing and fixing in position FE 550D TMT (with CRS) bar reinforcement including cutting, bending and tying complete as per detailed drawings. (A) R.C.C. Wearing coat . (upto 10 ton)	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
79	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 @ 250 gms per sqm area, thickness of 2.5 mm is excluding of surface applied glass beads as per IRC: 35-2015. The finished surface to be leveled, 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 cemented road shall be 130 mcd / m ² / lux and asphalt roads shall be minimum 100 mcd / m ² / 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 retro reflectivity shall be two years. (For Approach viaduct Portion)	Relevant Specifications of MORT&H fifth revision Section – 800 & and latest GR of R&B Department as per SOR/ 1018/715/ C-1 shall apply to this item.
80	Cat Eye / Road Stud / RPM: Supplying of Molded Twin Shanks Raised Pavement Markers made of polycarbonate and ABS moulded body and reflective panels with Micro prismatic lens (No Glass bead lens) capable of providing total internal reflection of the light entering the lens face and shall support a load of 13635 kgs. tested in accordance to ASTM D 4280 Type H and complying to Specifications of Category A of MORTH Circular No RW/NH/33023/10-97 – DO III Dt 11.06. 1997. The height, width and length shall not exceed 20 mm, 130 mm and 130 mm and with minimum reflective area of 13 Sqcm on each side and the slope to the base shall be 35 +/- 5 degree. The strength of detachment of the integrated cylindrical	Relevant Specifications of MORT&H fifth revision Section – 800 shall apply to this item.

Item No.	Item Description	Specification as per MORT&H
	shanks, (of diameter not less than 19 +/- 2 mm and height not less than 30+/- 2 mm) from the body is to be a minimum value of 500 Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and The color of the marker should be as per the IRC 35-2015 and as directed by Engineer-in-charge. (For Approach viaduct Portion)	
81	Providing and fixing the Continuity arrangement in deck slab as per the detailed drawing with fixtures, components, filler etc. complete as directed by Engineer in charge.	As per item Description & as Directed by Engineer in charge.
82	Excavation for foundation in sand , gravel, clay soft soils and murrum etc. including shoring, strutting dewatering as necessary and disposing of the excavated stuff as directed.(A) Depth upto 3.0 M. and lead upto 100m for 10 Cum (For Retaining wall & Toe Wall).	Relevant Specifications of MORT&H fifth revision Section – 304 shall apply to this item.
83	Excavation in large boulders and soft rock by welding including shoring, strutting and dewatering as necessary and disposing of the excavated stuff as directed. (For Retaining wall & Toe Wall)	Relevant Specifications of MORT&H fifth revision Section – 300 shall apply to this item.
84	Providing and filling in foundation with ordinary Cement concrete M-15 mix and providing necessary vertical pin headers including formwork, vibrating, ramming and curing complete. (For Retaining wall & Toe Wall)	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700 & 2100 shall apply to this item.
85	Providing and Casting in situ Controlled Cement Concrete M35 for R.C.C. Raft footing and cutt-off walls including necessary shuttering laying, vibrating, ramming and curing complete. (For Retaining wall)	Relevant Specifications of MORT&H fifth revision Section –1500, 1700 & 2100 shall apply to this item.
86	Providing and placing in position FE 550D (With CRS) TMT bar reinforcement for following items including cutting bending hooking and tying complete as per detailed drawing.For RCC Retaining wall Open foundation.	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
87	Providing and casting in situ controlled cement concrete M-35 for R.C.C. return as per drawings including centering shuttering, scaffolding where necessary, laying vibrating, curing and finishing complete. (1) RCC Retaining wall Stem (A) Height Upto 5.0 M.	Relevant Specifications of MORT&H fifth revision Section –1500, 1700 & 2200 shall apply to this item.
	(B) Height 5.0M to 10.0M	
88	Providing and laying in position FE 550D (With CRS) TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) RCC Retaining wall Stem	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
89	Providing and applying anti carbonation, anti fading, mold resistant, heat insulating, and 100% acrylic breathable decorative external waterproof coating of approved shade having Viscosity @ Room Temperature by Ford cup No. B-4 (dilute 2 parts of product with 1 part of water) 18 to 30 sec. pH of 7.00 to 10.00 and Sp. Gravity @ Room Temperature 1.30+0.1, tested for carbon dioxide diffusion resistance properties for coating materials and coating systems for open atmosphere surface of substructure as well as superstructure as per DIN EN 1062-6 (2002-2010) by a NBA Grade "A"	As per item Description & as Directed by Engineer in charge.

Item No.	Item Description	Specification as per MORT&H
	accredited institution.	
90	"Art painting work over various components of ROB / FOB / Underpass with three coat water coat putty of approved brand after duly rubbing the surface to make the surface even end smooth. The work includes one coat of exterior primer coat of approved brand and three or more coat of exterior plastic emulsion paint of approved brand over the prepared surface. Over this art painting work to be done as per direction and design pattern approved by Engineer-incharge. The work includes the cost centering, shuttering, scaffolding and clearing the site properly after completion of work. The work also includes the cost of all material, manpower, stencils etc. required for art painting. (A) Outer Face of Crash Barrier"	As per item Description & as Directed by Engineer in charge.
91	Providing and laying - Fitter Media 600mm thick directed at the back of abutments as per detailed specifications. (For Retaining wall & Toe Wall)	Relevant Specifications of MORT&H fifth revision Section –2504 shall apply to this item.
92	Providing and filling sand behind abutments and between returns in layers as directed by Engineer In-charge. (For Retaining wall & Toe Wall)	As per item Description & as Directed by Engineer in charge.
93	Providing & laying weep hole in Abutments, and returns by using A.C. pipe of 100 mm including laying in proper grade and jointing the completed as per detailed specification. (For Retaining wall & Toe Wall)	Relevant Specifications of MORT&H fifth revision Section –2706 shall apply to this item.
94	Providing and casting in-situ controlled cement concrete M 30 for approach slab including formwork curing and finishing complete	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700, 2704, 2708 to 2709 shall apply to this item.
95	Providing and casting in-situ controlled cement concrete M 20 For Raft and cutoff walls including necessary formwork, vibrating curing, and finishing complete (Toe Wall)	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700 & 2100 shall apply to this item.
96	Providing and casting RCC in M-40 controlled concrete crash barrier as per detailed drawings including necessary scaffolding, centering, formwork, mixing in machine, transporting, placing, compacting, finishing, curing, etc. complete including providing and fixing of inserts if any with all leads and lifts as per drawing & specification and as directed by Engineer, excluding reinforcement. (For Retaining wall & Toe Wall)	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700, 2700 shall apply to this item.
97	Providing and fixing in position FE 550D (With CRS) TMT bar reinforcement including cutting, bending and tying complete as per detailed drawings. (A) R.C.C. Approach slab, (B) Toe Wall, (C) Crash Barrier	Relevant Specifications of MORT&H fifth revision Section –1600 & 1009 shall apply to this item.
98	Painting Two Coats on New Concrete Surfaces (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces) - For inner face of crash barrier	As per item Description & as Directed by Engineer in charge.
99	Providing and laying Double Walled corrugated Pipes (DWC) of Polyethylene (conforming to IS:14930-II) of 50mm O.D. / 38mm I.D. with	As per IS 4985 Specification and item

Item No.	Item Description	Specification as per MORT&H
	fittings and necessary connecting accessories of same material at required depth for laying cable below footpath slab etc. complete as per specification and as directed by Engineer.	Description as Directed by Engineer in charge.
100	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 50m lead (For Service Road).	Relevant Specifications of MORT&H fifth revision Section – 408 shall apply to this item.
101	Earthwork for embankment including breaking clods, dressing with all lead and lift and including watering rolling and consolidation of subgrade in layers at O.M.C. to required dry density including filling the depression which occur during the process using vibratory roller 8t to 10t. (A) From borrow pits within land width (For Service Road).	The relevant specifications as per relevant MORT&H specification Section 305 & 900.
102	Construction of granular sub-base (Grade - V) by providing coarse graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per MoRTH clause 401 (For Approach Retaining wall + Toe wall & Service Road).	Relevant Specifications of MORT&H fifth revision Section – 401 shall apply to this item.
103	Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 150 kg/ cum, optimum moisture content to be maintain during construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver compacting with 8-10 tonnes vibratory roller, finishing and curing as per MoRTH clause 601.	Relevant Specifications of MORT&H fifth revision Section – 601 shall apply to this item.
104	Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with in M -40 grade of concrete with 53 grade cement , coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site and mechanically laid with a fixed form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing as per MoRTH clause 602	Relevant Specifications of MORT&H fifth revision Section – 602 shall apply to this item.
105	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 (For Underspace).	As per item Description & as Directed by Engineer in charge.
106	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 @ 250 gms per sqm area, thickness of 2.5 mm is excluding of surface applied glass beads as per IRC: 35-2015. The finished surface to be leveled, uniform and free from streaks and holes. Zebra patta/bump patta lane/centre line/edge line/cut patta. The white colour marking should provide	Relevant Specifications of MORT&H fifth revision Section – 800 & and latest GR of R&B Department as per SOR/ 1018/715/ C-1 shall apply to this item.

Item No.	Item Description	Specification as per MORT&H
	liminance coefficient on cemented road shall be 130 mcd / m ² / lux and asphalt roads shall be minimum 100 130 mcd / m ² / 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 (For Approach Retaining wall + Toe wall & Service Road)..	
107	Cat Eye / Road Stud / RPM: Supplying of Molded Twin Shanks Raised Pavement Markers made of polycarbonate and ABS moulded body and reflective panels with Micro prismatic lens (No Glass bead lens) capable of providing total internal reflection of the light entering the lens face and shall support a load of 13635 kgs. tested in accordance to ASTM D 4280 Type H and complying to Specifications of Category A of MORTH Circular No RW/NH/33023/10-97 – DO III Dt 11.06. 1997. The height, width and length shall not exceed 20 mm, 130 mm and 130 mm and with minimum reflective area of 13 Sqcm on each side and the slope to the base shall be 35 +/- 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 +/- 2 mm and height not less than 30 +/- 2 mm) from the body is to be a minimum value of 500 Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and The color of the marker should be as per the IRC 35-2015 and as directed by Engineer-in-charge (For Approach Retaining wall + Toe wall & Service Road).	Relevant Specifications of MORT&H fifth revision Section – 800 shall apply to this item.
108	Retro-Reflective road signs. a) Facility Informatory Sign :-Providing and fixing sign boards made out of 2mm aluminium sheet / 4mm ACP (Aluminum composite Panel); size 80 x 60 cms rectangular as per design of IRC-67-2012. Pre treated with phospheting process & acid etching; coated with one coat of epoxy primer and two coats of best quality epoxy paint ;reflectorised with Micro Prismatic Grade retro reflectivesheeting of Type-11 as per ASTM D-4956 and latest M.O.S.T.Specifications; 3.6mtr long stand post of 75 x 75 x 6mm / 65NB Circular MS Pipe as required and frame fabricated from suitable size iron angle of 35 x 35 x 3mm; painted with bestquality epoxy coatings in black and white bends. The details of symbol foreach board shall be as per theinstruction of engineer in charge. The fixing at site shall be in 1:2:4 CC blockof size 45 x 45 x 60 Cms. for each leg.including excavation, curing etc.complete under the supervision of engineer in charge. A warranty for 10 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (A) Class-C Type-11 Retro Reflective sheeting	Relevant Specifications of MORT&H fifth revision Section – 800 shall apply to this item.
	b) Regulatory / Mandatory Sign :-Providing and fixing sign boards made out of 2mm aluminium sheet / 4mm ACP (Aluminum composite Panel); size 60 cms Dia Circle as per design of IRC-67-2012. Pre treated with phospheting process & acid etching; coated with one coat of epoxy primer and two coats of best quality epoxy paint ;reflectorised with Micro Prismatic Grade retro reflectivesheeting of Type-11 as per ASTM D-4956 and latest M.O.S.T.Specifications; 3.6mtr long stand post of 75 x 75 x 6mm / 65NB Circular MS Pipe as required and frame fabricated from suitable size iron angle of 35 x 35 x 3mm; painted with bestquality epoxy coatings in black and white bends. The details of symbol foreach board shall be as per theinstruction of engineer in charge. The fixing at site shall be in 1:2:4 CC blockof size 45 x 45 x 60 Cms. for each leg.including	Relevant Specifications of MORT&H fifth revision Section – 800 shall apply to this item.

Item No.	Item Description	Specification as per MORT&H
	excavation, curing etc.complete under the supervision of engineer in charge. A warranty for 10 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (A) Class-C Type-11 Retro Reflective sheeting	
	c) Hazard Marker Sign :-Providing and fixing sign boards made out of 1.5mm aluminium sheet / 3mm ACP (Aluminum composite Panel); size 90x30 cms. rectangular as per design of IRC-67-2012. Pre treated with phosphating process & acid etching; coated with one coat of epoxy primer and two coats of best quality epoxy paint ;reflectorised with Micro Prismatic Grade retro reflectivesheeting of Type-11 as per ASTM D-4956 and latest M.O.S.T.Specifications; 1.8mtr long stand post of 75 x 75 x 6mm / 65NB Circular MS Pipe as required and frame fabricated from suitable size iron angle of 35 x 35 x 3mm; painted with bestquality epoxy coatings in black and white bends. The details of symbol foreach board shall be as per theinstruction of engineer in charge. The fixing at site shall be in 1:2:4 CC blockof size 45 x 45 x 60 Cms. for each leg.including excavation, curing etc.complete under the supervision of engineer in charge. A warranty for 10 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (A) Class-C Type-11 Retro Reflective sheeting	Relevant Specifications of MORT&H fifth revision Section – 800 shall apply to this item.
	d) Direction (Junction) Sign :-Providing and fixing sign boards made out of 2mm aluminium sheet / 4mm ACP (Aluminum composite Panel); size 244x122 cms. rectangular as per design of IRC-67-2012. Pre treated with phosphating process & acid etching; coated with one coat of epoxy primer and two coats of best quality epoxy paint ;reflectorised with Micro Prismatic Grade retro reflectivesheeting of Type-11 as per ASTM D-4956 and latest M.O.S.T.Specifications; 4.0mtr long (2 Nos.) stand post of 75 x 75 x 6mm / 65NB Circular MS Pipe as required and frame fabricated from suitable size iron angle of 50 x 50 x 5mm; painted with bestquality epoxy coatings in black and white bends. The details of symbol foreach board shall be as per theinstruction of engineer in charge. The fixing at site shall be in 1:2:4 CC blockof size 45 x 45 x 60 Cms. for each leg.including excavation, curing etc.complete under the supervision of engineer in charge. A warranty for 10 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (A) Class-C Type-11 Retro Reflective sheeting	Relevant Specifications of MORT&H fifth revision Section – 800 shall apply to this item.
	e) Men at work (2' x 2') sign :-Providing and fixing sign boards made out of 2.0 mm aluminium sheet / 4 mm ACP(Aluminum composite Panel); size 60cm x 60cm square as per design of IRC-67-2012. Pre treated with phosphating process & acid etching; coated with one coat of epoxy primer and two coats of best quality epoxy paint ;reflectorised with Micro Prismatic Grade retro reflectivesheeting of Type-11 as per ASTM D-4956 and latest M.O.S.T.Specifications; 3.3 mtr long stand post of 75 x 75 x 6mm / 65NB Circular MS Pipe as required and frame fabricated from suitable size iron angle of 50 x 50 x 5mm; painted with bestquality epoxy coatings in black and white bends. the details of symbol or inscription / numerals for each board shall be as per the instruction of engineer in charge.The fixing at site shall be in 1:2:4 CC blockof size 45 x 45 x 60 Cms. for each leg.including excavation, curing etc.complete under the supervision of engineer in charge. A warranty for 10 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product	Relevant Specifications of MORT&H fifth revision Section – 800 shall apply to this item.

Item No.	Item Description	Specification as per MORT&H
	offered shall be submitted by contractor. (A) Class-C Type-11 Retro Reflective sheeting	
	f) Danger Plate :-Providing & fixing sign board made out of 2.0 mm aluminium sheet / 4 mm ACP (aluminum Composite Panel), size 30cms diameter circle, pretreated with phosphating process and acid etching, painted with one coat of epoxy primer and two coats of best quality epoxy paint reflectorised with retro reflective sheeting as per latest M.O.S.T. specifications. A warranty for 10 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (A) Class-C Type-11 Retro Reflective sheeting	Relevant Specifications of MORT&H fifth revision Section – 800 shall apply to this item.
	g) Cautionary Warning Sign :-Providing and fixing sign boards made out of 2mm aluminium sheet / 4mm ACP (Aluminum composite Panel); size 90 x 90 x 90 cms. equilateral triangle as per design of IRC-67-2012. Pre treated with phosphating process & acid etching; coated with one coat of epoxy primer and two coats of best quality epoxy paint ;reflectorised with Micro Prismatic Grade retro reflectivesheeting of Type-11 as per ASTM D-4956 and latest M.O.S.T.Specifications; 3.6mtr long stand post of 75 x 75 x 6mm / 65NB Circular MS Pipe as required and frame fabricated from suitable size iron angle of 35 x 35 x 3mm; painted with bestquality epoxy coatings in black and white bends. The details of symbol foreach board shall be as per theinstruction of engineer in charge. The fixing at site shall be in 1:2:4 CC blockof size 45 x 45 x 60 Cms. for each leg.including excavation, curing etc.complete under the supervision of engineer in charge. A warranty for 10 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (A) Class-C Type-11 Retro Reflective sheeting	Relevant Specifications of MORT&H fifth revision Section – 800 shall apply to this item.
	h) Distance Informatory / Destination Sign :-Providing and fixing sign boards made out of 2mm aluminium sheet / 4mm ACP (Aluminum composite Panel); size 180x120 cms. rectangular as per design of IRC-67-2012. Pre treated with phosphating process & acid etching; coated with one coat of epoxy primer and two coats of best quality epoxy paint ;reflectorised with Micro Prismatic Grade retro reflectivesheeting of Type-11 as per ASTM D-4956 and latest M.O.S.T.Specifications; 4.0mtr long (2 Nos.) stand post of 75 x 75 x 6mm / 65NB Circular MS Pipe as required and frame fabricated from suitable size iron angle of 50 x 50 x 5mm; painted with bestquality epoxy coatings in black and white bends. The details of symbol foreach board shall be as per theinstruction of engineer in charge. The fixing at site shall be in 1:2:4 CC blockof size 45 x 45 x 60 Cms. for each leg.including excavation, curing etc.complete under the supervision of engineer in charge. A warranty for 10 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (A) Class-C Type-11 Retro Reflective sheeting	Relevant Specifications of MORT&H fifth revision Section – 800 shall apply to this item.
	i) Village Name Sign :-Providing and fixing sign boards made out of 2mm aluminium sheet / 4mm ACP (Aluminum composite Panel); size 90x60 cms. rectangular as per design of IRC-67-2012. Pre treated with phosphating process & acid etching; coated with one coat of epoxy primer and two coats of best quality epoxy paint ;reflectorised with Micro Prismatic Grade retro reflectivesheeting of Type-11 as per ASTM D-4956 and latest M.O.S.T.Specifications; 3.3mtr long stand post of 75 x 75 x	Relevant Specifications of MORT&H fifth revision Section – 800 shall apply to this item.

Item No.	Item Description	Specification as per MORT&H
	6mm / 65NB Circular MS Pipe as required and frame fabricated from suitable size iron angle of 35 x 35 x 3mm; painted with best quality epoxy coatings in black and white bends. The details of symbol or inscription/letters / numerals for each board shall be as per the instruction of engineer in charge. The fixing at site shall be in 1:2:4 CC block of size 45 x 45 x 60 Cms. for each leg including excavation, curing etc. complete under the supervision of engineer in charge. A warranty for 10 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (A) Class-C Type-11 Retro Reflective sheeting	
109	Excavation for foundation in sand, gravel, clay soft soils and murrum etc. including shoring, strutting dewatering as necessary and disposing of the excavated stuff as directed. (A) Depth upto 3.0 M. and lead upto 100m for 10 Cum (For Box Drain & Pipe Culvert).	Relevant Specifications of MORT&H fifth revision Section – 304 shall apply to this item.
110	Providing and filling in foundation with ordinary Cement concrete M-15 mix and providing necessary vertical pin headers including formwork, vibrating, ramming and curing complete (For Box Drain & Pipe Culvert).	Relevant Specifications of MORT&H fifth revision Section – 1500, 1700 & 2100 shall apply to this item.
111	Dismantling the existing structure including removing and stacking the dismantled materials as and where directed - RCC work & PCC Work RCC PCC	Relevant Specifications of MORT&H fifth revision Section – 202 shall apply to this item.
112	Providing and Casting in situ Controlled Cement Concrete M25 for Box Drain and Head walls including necessary shuttering laying, vibrating, ramming and curing complete (For Box Drain & Pipe Culvert).	Relevant Specifications of MORT&H fifth revision Section – 1700, 2100 & 2200 shall apply to this item.
113	Providing and placing in position FE 550D (With CRS) TMT bar reinforcement for following items including cutting bending hooking and tying complete as per detailed drawing. For RCC Raft & Open foundation (For Box Drain & Pipe Culvert Head Wall).	Relevant Specifications of MORT&H fifth revision Section – 1600 & 1009 shall apply to this item.
114	Earthwork for embankment including breaking clods, dressing with all lead and lift and including watering rolling and consolidation of subgrade in layers at O.M.C. to required dry density including filling the depression which occur during the process using vibratory roller 8t to 10t. (A) From borrow pits within land width.	The relevant specifications as per relevant MORT&H specification Section 305 & 900.
115	Supplying and fixing reinforced concrete heavy duty non-pressure pipes with collars for culverts including setting and joining the pipes in C.M. 1:2 watering and laying (To level of slopes of I.S. 458 / 1971 Class NP4 casted by vertically vibrated technology of following internal diameter. 900mm dia Pipe Culvert).	Relevant Specifications of MORT&H fifth revision Section – 1013 & 2900 shall apply to this item.
116	Providing and laying rubble for appron (Each stone weighting not less than 40 kg.) including and packing and filling in the interstices with quarry spalls. (More than 10 ton)	Relevant Specifications of MORT&H fifth revision Section – 2503 shall apply to this item.
117	Planting of Trees and their Maintenance (Planting of trees by the central verge / Road side and maintaining the plants)	As per item Description & as Directed by Engineer in charge.

