



**SURAT MUNICIPAL CORPORATION
(BRIDGE CELL)**

**TENDER FOR
WIDENING OF EXISTING CANAL CULVERT/BRIDGE STRUCTURE ON 60.0 M
WIDE D.P. ROAD CONNECTING NATIONAL HIGH WAY IN WEST ZONE
(RANDER) AREA**

E-Tender Notice (Online) No. ACE& I/C CE/BRIDGE/01/2026-27(Work No. 07)

<u>VOLUME: II</u> <u>TECHNICAL SPECIFICATIONS</u>	
Starting date of down loading of the online tender documents	04/06/2026
Last date of on line queries to be submitted (Online pre bid)	-----
Last date of downloading & submission of online tender documents	19/06/2026 up to 18:00 hrs.
<ul style="list-style-type: none">Physical submission of Demand draft in original for Tender Fee & EMD by RPAD / Speed post (through postal authority only) so as to reach to the Chief Accountant, Account Department, Surat Municipal Corporation, Shree Tapi Bhavan, Tapipura, Surat-395003, duly super scribed with name of work and tender notice no.Note : Any documents in supporting of bid including scanned copy of the demand draft for tender fee and EMD shall be in electronic format only through online (by scanning) & hard copy will not be accepted separately.S.M.C. shall not be responsible for any postal delay.	On all working days between 20/06/2026 to 29/06/2026 From 10:30 hrs. to 18:00 hrs.

CONSULTANTS:

Infinite Civil Solution Private Limited
INFINITE HOUSE, FP-25,
CIMS Hospital Rd,
nr. Aditya Elegance & Railway Track
Panchamrut Bunglows II, Sola
Ahmedabad, Gujarat 380060

CLIENT :

The Municipal Commissioner,
Surat Municipal Corporation,
Shree Tapi Bhavan, Tapipura
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NAME OF WORK : WIDENING OF EXISTING CANAL CULVERT/BRIDGE STRUCTURE ON 60.0 M WIDE D.P. ROAD CONNECTING NATIONAL HIGH WAY IN WEST ZONE (RANDER) AREA.

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SECTION – 1 GENERAL TECHNICAL SPECIFICATIONS:

GENERAL:

These specifications cover the items of work in structural and non-structural parts of the works coming under purview of this document. All work shall be carried out in confirmation with these specifications. In general, provisions of Indian Standard, Indian Road Congress codes, MORTH specifications (**5thRevision**), standard specification of Gujarat Govt., and other national standards shall be followed unless otherwise specified. These specifications are not intended to cover the minor details. The work shall be executed in accordance with best modern practices & all latest codes and standards referred to in these specifications and their revisions issued 30 days prior to submission of tender shall be read in conjunction with the various other documents forming the contract viz. Tender specifications, Price bid, contract drawings and other related documents.

ORDER OF PRECEDENCE

For this document, in case of errors, omissions and/or disagreement between written and scaled dimensions on the drawings or between the drawings and specifications etc. the following order of precedence shall apply:

- a) Between scaled dimensions and written dimensions / description on a drawing, the later shall be accepted.
- b) Between the written or shown description/or dimensions in the drawing, and the corresponding one in the specification, the later shall apply.
- c) **For execution stage, the following order of precedence shall apply.**
 - (i) Specific provisions of specifications and conditions of this contract document.
 - (ii) Execution drawings/ notes/ modifications specifically approved for construction.
 - (iii) In the absence of above, standard specifications of **MORTH (5thRevision)/ R&B** and Good engineering practices in that order.

In case of conflicting provisions of IRC specifications and IS specifications, former shall prevail, i.e., IRC specifications would have precedence over IS specifications unless tender provisions are specific for the particular item of work.

However, notwithstanding anything said above, the interpretation/ decision of the Municipal Commissioner / Engineer-in- charge shall be final and binding.

1. **Inclusive documents:**

The provisions of all conditions of contract, those specified in this tender as well as execution drawings, and notes or other specifications issued in writing by the Engineer-in charge shall form part of these specifications.

2. **Order of precedence, clarifications and interpretations:**

When the various specifications and codes referred to in preceding portion are at variance with these specifications and or with each other, the order of precedence will generally be as under;

The attention of the contractor is drawn to those clauses of IS Codes which require either supplementing specifications from the Engineer-in-charge or the call for mutual agreement of such specifications between the supplier and purchaser. In such cases, it shall be responsibility of the contractor to seek clarifications on any uncertainty, ambiguity and obtain prior approval of the Engineer-in-charge, before taking up supply/construction etc.



3 Measurement and Payments:

- (a) The methods of measurement and payment shall be as given in Price Bid – Payment Terms. Should there be any detail of construction of materials which has not been referred to in the specifications or in the drawings but the necessity for which may be implied or inferred there from, or which are usual or essential for the completion of the work in the trades, the same shall be deemed to be included in the rates quoted by the contractor in the Price Bid.

(b) **Unacceptable work**

All defective works are liable to be demolished, rebuilt and defective materials replaced by the contractor at his own cost. In the event of such works being accepted by carrying out repairs etc. as specified by the Engineer-in-charge, the cost of repairs will be borne by the contractor and will be paid for the works actually carried out by him at reduced rates of the tendered rates, as may be considered reasonable by the Engineer-in-charge, in the preparation of final or on account bills.



SECTION –2: ITEMWISE TECHNICAL SPECIFICATIONS AND CODES TO BE FOLLOWED (CIVIL PORTION)

The Technical Specifications to be followed shall be as per “Specifications for Road and Bridge Works” Fifth Revision published by Indian Roads Congress on behalf of Ministry of Road Transport and Highways (MORTH), Govt of India.

Sr No.	Item Description	MORTH 5th Revision Specifications / IS Code/ASTM code Applicable
1	Clearing and grubbing road land including uprooting rank, vegetation, grass, bushes, shrubs, sapling and trees girth up to 300mm removal of stumps of trees cut earlier and disposal of unserviceable materials to be used of auctioned up to 1000 meters including removal of top organic soil not exceeding 150 mm in thickness.	Cl. No. 201 As per Item Description & directed by Engineer in charge.
2	Carry out alignment survey work by total station including marking of centre line of the bridge and various other component structures, taking ground levels and details of existing structures within 40m from centre line, providing and fixing necessary reference pillars, establishing bench marks, establishing foundation layout on ground, including submission longitudinal section, cross section and report of survey work in three copies with soft copy in CD to Engineer-in-charge as directed.	Cl. No.109,2400, As per Item Description & directed by Engineer in Charge
3	Carryout Geotech investigation work including drilling 150 mm dia bore holes in all sorts of soil, ordinary rock and hard rock, upto maximum depth as mentioned, collecting undisturbed samples and conducting standard penetration tests alternate at an interval of 1.5 to 2.0 m depth, conducting all necessary laboratory tests as per IRC provision, showing bore log locations, their RL of GL, for all type of classification and determination of soil parameters, including submission of report in three copies covering investigation data and recommendation for SBC & providing all parameters as per IRC considering the design criteria, all as per specification , as and where required and as per instruction of engineer in charge	Cl. No. 2400 As per Item Description & directed by Engineer in Charge.
4	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 10Cum.	Cl. No. 304 As per Item Description & Directed by Engineer in Charge.
5	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.(B) Depth from 3.0 to 6.0 M.and lead upto 100mfor 10 Cum	Cl. No. 304 As per Item Description & Directed by Engineer in Charge.
6	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.(C) Depth from 6.0M. to 9.0M. and lead upto100mm considering for	Cl. No. 304 As per Item Description & Directed by Engineer in Charge.



7	Providing and casting in situ Ordinary cement concrete M-150 for R.C.C. Raft and cut-off walls including necessary shuttering laying, vibrating, ramming and curing complete	Cl. No. 1500, 1700 As per Item Description & Directed by Engineer in Charge
8	Providing and casting in situ Ordinary cement concrete M-150 for canal lining including necessary shuttering laying, vibrating, ramming and curing complete	Cl. No. 1500, 1700 As per Item Description & Directed by Engineer in Charge
9	Providing and Casting in-situ controlled Cement Concrete M-35 for R.C.C. Raft and cutt-off walls including necessary shuttering laying, vibrating, ramming and curing complete.	Cl. No. 1500, 1700, 1107 As per Item Description & Directed by Engineer in Charge
10	Providing and laying in position FE 550D TMT bar reinforcement including providing fusion bonded epoxy coating not less than 175-micron thickness and up to 300 microns to reinforcement bar as per IS 13620 1993/ASTM-775 M including testing of coating at plant and all taxes and transporting to the site from factory, cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) Abutment Footing, (B) Pier Footing	Cl. No. 1600, 1786 As per Item Description & Directed by Engineer in Charge.
11	Providing and casting in-situ controlled cement concrete M-35 for R.C.C. return as per drawings including cantering shuttering, scaffolding where necessary, laying vibrating, curing and finishing complete. (A) Height from 0.0 to 5.0 M. (1) Piers (2) Abutment (3) RCC return	Cl. No. 1500, 1700, 1107 As per Item Description & Directed by Engineer in Charge
12	Providing and casting in-situ controlled cement concrete M-35 for R.C.C. work in pier cap, abutment cap and dirt wall including controlled cement concrete M-30 bed blocks or pedestals of required size below bearings as per detailed drawings, cantering, shuttering, scaffolding, wherever necessary, laying vibrating, curing and finishing complete.	Cl. No. 1500, 1700, 1107 As per Item Description & Directed by Engineer in Charge
13	Providing and laying in position FE 550D TMT bar reinforcement including providing fusion bonded epoxy coating not less than 175-micron thickness and up to 300 microns to reinforcement bar as per IS 13620 1993/ASTM-775 M including testing of coating at plant and all taxes and transporting to the site from factory, cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) Piers (B) Abutments (C) R.C.C. Returns (A) Abutment cap & Dirt wall. (B) Pier Cap.	Cl. No. 1600, 1786 As per Item Description & Directed by Engineer in Charge.
14	Providing and casting in-situ controlled cement concrete M-35 for R.C.C. solid slab including cantering, scaffolding, curing and finishing complete	Cl. No. 1500, 1700, 1107 As per Item Description & Directed by Engineer in Charge
15	Providing and laying in position FE 550D TMT bar reinforcement including providing fusion bonded epoxy coating not less than 175-micron thickness and up to 300 microns to reinforcement bar as per IS 13620 1993/ASTM-775 M including testing of coating at plant and all taxes and transporting to the site from factory, cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) Solid Slab,	Cl. No. 1600, 1786 As per Item Description & Directed by Engineer in Charge.



16	Providing and filling in position Premoulded Asphalt joint filler Board 20mm size as directed by Engineer in charge	Cl. No. 602 As per Item Description & Directed by Engineer in Charge.
17	Providing and Laying in Tar Paper Below Solid Slab from approved manufacturer only as per drawing.	IS 1398 As per Item Description & Directed by Engineer in Charge.
18	Providing and casting in-situ controlled cement concrete of M40 grade for RCC Crash barrier with 20mm down coarse aggregate of the required size including formwork, placing in position, consolidating with mechanical vibrators, curing, finishing, etc. complete.	Cl. No. 1600, 1700, 2703 As per Item Description & Directed by Engineer in Charge.
19	Providing and Fixing 40mm dia. pipe railing 450mm height including 2 coats of painting to steel works complete.	Cl. No. 809, 810 As per Item Description & Directed by Engineer in Charge.
20	Providing and laying in position FE 550D TMT bar reinforcement including providing fusion bonded epoxy coating not less than 175-micron thickness and up to 300-micron to reinforcement bar as per IS 13620 1993/ASTM-775 M including testing of coating at plant and all taxes and transporting to the site from factory, cutting, bending, hooking and tying complete as per detailed drawings for the following. RCC Crash Barrier	Cl. No. 1600,1786 As per Item Description & Directed by Engineer in Charge.
21	Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorized representative ensuring compliance to the manufacturer's instructions for installation.	Cl. No. 2606 As per Item Description & Directed by Engineer in Charge.
22	Providing and filling sand behind abutments and between returns & retaining wall in layers as directed.	Cl. No. 2907 As per Item Description & Directed by Engineer in Charge.
23	Providing and laying filter media 600mm thick as directed at the back of abutments, returns walls, retaining wall, etc as per technical specifications	Cl. No. 2504 As per Item Description & Directed by Engineer in Charge.
24	Providing Weep holes in RCC abutment and returns by using A.C. pipe of 100 mm including laying in proper grade and jointing the complete as per detail specification.	Cl. No. 2706 As per Item Description & Directed by Engineer in Charge.
25	Providing and casting in-situ controlled cement concrete M-150 for approach slab including formwork curing and finishing complete	Cl. No. 1500, 1700 As per Item Description & Directed by Engineer in Charge
26	Providing and casting in-situ controlled cement concrete M-30 for approach slab including formwork curing and finishing complete.	Cl. No. 1500, 1700, 1107 As per Item Description & Directed by Engineer in Charge



27	Providing and laying in position FE 550D TMT bar reinforcement including providing fusion bonded epoxy coating not less than 175-micron thickness and up to 300-microns to reinforcement bar as per IS 13620 1993/ASTM-775 M including testing of coating at plant and all taxes and transporting to the site from factory, cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) R.C.C. Approach slab.	Cl. No. 1600,1786 As per Item Description & Directed by Engineer in Charge.
28	Providing PVC 100mm diameter water spouts including necessary grating as per drawings	Cl. No. 2700 As per Item Description & Directed by Engineer in Charge.
29	Carrying out load test of super structure as directed including all necessary materials plant equipment, instruments, labour and arrangements for test directed.	IRC SP 51 Cl. No. 2000
30	Providing flood gauge marks on substructure as per design including painting complete.	IRC SP 4986
31	Numbering the C.D, work with approved paint including all materials for painting etc. complete.	Cl. No. 803 As per Item Description & Directed by Engineer in Charge.
32	Providing and fixing Premoulded compressible filler board in black colour confirming to MoRTH Specifications (Clause 1015), having minimum density 95kg/cum. nonstinging with less than 1% water absorption & compression recovery of 93% minimum as per specification for 20 mm wide expansion joint including cutting to required size and shape at all levels etc. complete as directed.	Cl. No. 602, 1015 As per Item Description & Directed by Engineer in Charge.
33	Structural steel work (Confirming to IS 4923-1997) riveted, bolted or welded in built-up for all type sections, in framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete as per the structural designs and directions of Engineer in charge.	Cl. No. 1900 IS 4923-1997 As per Item Description & Directed by Engineer in Charge.
34	Sealing of cracks/porous concrete by injection process through nipples / Grouting complete as per Technical Specification.	Cl. No. 2700,2705 As per Item description & directed by Engineer in charge.
35	Excavation for RCC Retaining wall foundations in sand, gravel, clay, soft soils, murrum, hard murrum, boulders, very stiff or sticky clays, etc. including shoring, strutting and dewatering as necessary and depositing of the excavated stuff as directed for all lead, back filling the excavated pit by approved excavated material etc. complete as per specification. Depth upto 3.0 M. and lead upto 100m for 10 Cum	Cl. No. 304 As per Item Description & Directed by Engineer in Charge.
36	Excavation for RCC Retaining wall foundations in sand, gravel, clay, soft soils, murrum, hard murrum, boulders, very stiff or sticky clays, etc. including shoring, strutting and dewatering as necessary and depositing of the excavated stuff as directed for all lead, back filling the excavated pit by approved excavated material etc. complete as per	Cl. No. 304 As per Item Description & Directed by Engineer in Charge.



	specification. Depth from 3.0 to 6.0 M. and lead upto 100m for 10 Cum	
37	Providing and casting in situ Ordinary cement concrete M-150 for R.C.C. Raft and cut-off walls including necessary shuttering laying, vibrating, ramming and curing complete	Cl. No. 1500, 1700 As per Item Description & Directed by Engineer in Charge
38	Providing and casting in-situ controlled cement concrete of M30 grade for RCC work for foundation of RCC Retaining wall with 20mm down coarse aggregate of the required size for any depth including dewatering, scaffolding / cantering, shuttering, mixing, placing in position, consolidating with mechanical vibrators, curing, deshuttering carefully, making good the damages, fixing embedment, inserts, pockets, wherever necessary as per specification and drawing.	Cl. No. 1500, 1700 As per Item Description & Directed by Engineer in Charge
39	Providing and casting in-situ controlled cement concrete of M30 grade for RCC Retaining wall with 20mm down coarse aggregate of the required size for heights mentioned below including, centring, shuttering, scaffolding wherever necessary, laying, placing in position, consolidating with mechanical vibrators, curing, finishing, deshuttering carefully, making good the damages, fixing embedment, inserts, pockets, wherever necessary as directed and as per drawing with F3 type exposed concrete finish and form mark as directed by Engineer-in-charge, etc. complete as per specification. Height upto 5m.	Cl. No. 1500, 1700 As per Item Description & Directed by Engineer in Charge
40	Providing and laying in position FE 550D TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) RCC Retaining Wall	Cl. No. 1600 As per Item Description & Directed by Engineer in Charge.
41	Providing and laying filter media 600mm thick as directed at the back of abutments, returns walls, retaining wall, etc as per technical specifications	Cl. No. 2504 As per Item Description & Directed by Engineer in Charge.
42	Providing Weep holes in RCC abutment and returns by using A.C. pipe of 100 mm including laying in proper grade and jointing the complete as per detail specification.	Cl. No. 2706 As per Item Description & Directed by Engineer in Charge.
43	Providing and filling sand behind abutments and between returns & retaining wall in layers as directed.	Cl. No. 2907 As per Item Description & Directed by Engineer in Charge.
44	Providing and fixing post and pipe railing as per detailed drawing including 3 coats of painting to steel works complete	Cl. No. 809, 810 As per Item Description & Directed by Engineer in Charge.
45	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	Cl. No. 201 As per Item Description & directed by Engineer in charge.



46	Scarifying gravelled macadam or bitumen macadam surface 6.00 cm to 10.00 cm. depth including stacking useful materials on road side and disposing off remaining stuff.	Cl. No. 501 As per Item Description & directed by Engineer in charge.
47	Excavation for roadwork in soil with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross-sections, and transporting to the embankment location with a lift upto 1.5 m and lead upto 1000 m as per MoRTH (5th Revision) Specification Clause 301.	Cl. No. 301 As per Item Description & directed by Engineer in charge.
48	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 power roller 8T to 10T.(E) From Borrow area within 3.0KM. lead	Cl. No. 305 As per Item Description & directed by Engineer in charge.
49	Providing and laying Granular Sub Base (drainage layer) conforming to grading V of Table 400-1 of each layer not exceeding 200mm thickness and compacted thickness as per design & drawing with specified graded stone metal and sand mixed in pugmill and laid with mechanical means spreading with motor grader and compacting with vibratory roller having minimum 80- 100 KN static weight to achieve desired density of 98% of MDD including all materials, labour, machinery, tests required to be carried out with all leads and lifts etc., complete as per details in tender specification & as directed by engineer in charge.	Cl. No. 401 As per Item Description & directed by Engineer in charge.
50	Providing and laying Wet Mix Macadam with paver finisher in specified thickness, each layer not exceeding 200 mm compacted thickness including premixing in WMM plant with well graded crushed stone aggregate, with watering and spreading by mechanical means to required profile and compacting by vibratory roller of minimum 80-100 KN static weight to achieve desired density of 98% of MDD including all material, labour, machinery, test with all leads and lifts etc., complete as per details in tender specification & as directed by engineer in charge.	Cl. No. 406 As per Item Description & directed by Engineer in charge.
51	Supplying and applying Slow Setting-1 (SS-I) bitumen emulsion conforming to IS 8887, for application of prime coat over Wet Mix Macadam at the rate of 0.85 kg per Sq. Meter area, including all materials, labour, machinery, test with all leads and lifts etc., complete as per details in tender specification & as directed by engineer in charge.	Cl. No. 406 As per Item Description & directed by Engineer in charge.
52	Providing and laying DENSE GRADED BITUMINOUS MACADAM (DBM) as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5% for Grade II by wt. of total mix as binder by batch mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges, tests required to be carried out including cost of aggregate and filler (if found required as per mix design) etc complete (But including cost of providing bitumen)	Cl. No. 505 As per Item Description & directed by Engineer in charge.



52a	Carting and conveying of bitumen from refinery / any depot of oil companies to Surat including loading & unloading in suitable tanks/drums etc. Complete (without octroi charge applicable from time to time). (1) From Koyali and Savli refinery (Baroda)	As per Item Description & directed by Engineer in charge.
53	Supplying and applying Rapid Setting-1 (RS-I) bitumen emulsion confirming to IS 8887, for application of Tack coat before application of binder course at the rate of 0.27 kg. per Sq. Meter area, including all materials, labour, machinery, tests required to be carried out with all leads and lifts etc., complete as per details in tender specification & as directed by engineer in charge.	Cl. No. 503 As per Item Description & directed by Engineer in charge.
54	Providing and laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE (BC) using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.4% for Grade II by Wt. of total mix as binder by batch mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges, tests required to be carried out including cost of aggregate and filler (if found required as per mix design) etc. complete (including cost of providing bitumen)	Cl. No. 507 As per Item Description & directed by Engineer in charge.
54a	Carting and conveying of bitumen from refinery / any depot of oil companies to Surat including loading & unloading in suitable tanks/drums etc. Complete (without octroi charge applicable from time to time). (1) From Koyali and Savli refinery (Baroda)	As per Item Description & directed by Engineer in charge.
55	Supplying, stacking, spreading, rolling and watering hard murrum as directed for side shoulder as directed with all lead & lift.	Cl. No. 408 As per Item Description & directed by Engineer in charge.
56	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/centre line/ edge line/cut patta. The white colour marking should provide luminance coefficient on cement road shall be min 130 mcd/m ² /lux and Asphalt Road shall be min 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 the Retro reflectivity should be two years.	Cl. No. 803 IRC 35-2015 As per Item Description & directed by Engineer in charge.



57	Cat Eye / Road Stud / RPM: Supplying of Moulded Twin Shanks Raised Pavement Markers made of polycarbonate and ABS moulded body and reflective panels with micro prismatic 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 Sq.m cm 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 Kg. 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 manufacturers recommendation and the colour of the marker should be as per	Cl. No. 804 As per Item Description & directed by Engineer in charge.
58	Providing and fixing of 4 mm thick ACP Takti or SS Takti with minimum Size of 4' x 3' on RCC/Decorative pylons or directed by client along with Water Proof Mandap of minimum Size 100'x100', 75 Nos of VIP Chairs, 15 Nos of VIP Sofa including necessary electric fixtures like fan, cooler, lighting arrangement, D.G Sets etc as per site requirement and required to make it functional or as directed by Engineer In charge for Functions of Khat Muhurt and Lokarpan Vidhi/Vidhies of above work.	As per Item Description & directed by Engineer in charge.
59	Type - A, "W" : Metal Beam Crash Barrier (Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 811)	Cl. No. 811 IS: 1367, 1364 As per Item Description & directed by Engineer in charge.
60	Hazard Marker Sign: -Providing and fixing sign boards made out of 2.0 mm aluminium sheet / 4 mm ACP (Aluminium 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 High Intensity Prismatic Grade retro reflective sheeting of Type-4 as per ASTM D-4956 and latest M.O.S.T. Specifications; 1.8mtr long stand post of Iron Angle 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 best quality epoxy coatings in black and white bends. The details of symbol 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 7 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab	Cl. No. 806 IRC 67-2012 As per Item Description & directed by Engineer in charge.



	for the product offered shall be submitted by contractor. (B) Class-B Type-4 Retro Reflective sheeting	
61	<p>STOP Sign: -Providing and fixing sign boards made out of 2mm aluminium sheet / 4mm ACP (Aluminium composite Panel); size 90 cms. Octagonal 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 High Intensity Prismatic Grade retro reflective sheeting of Type-4 as per ASTM D-4956 and latest M.O.S.T. Specifications; 3.6mtr long stand post of Iron Angle 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 best quality epoxy coatings in black and white bends. The details of symbol 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 7 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. (B) Class-B Type-4 Retro Reflective sheeting.</p>	<p>Cl. No. 806 IRC 67-2012 As per Item Description & directed by Engineer in charge.</p>
62	<p>Hazard Marker Sign: -Providing and fixing sign boards made out of 2.0 mm aluminium sheet / 4 mm ACP (Aluminium 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 High Intensity Prismatic Grade retro reflective sheeting of Type-4 as per ASTM D-4956 and latest M.O.S.T. Specifications; 1.8mtr long stand post of Iron Angle 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 best quality epoxy coatings in black and white bends. The details of symbol 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 7 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. (B) Class-B Type-4 Retro Reflective sheeting</p>	<p>Cl. No. 806 IRC 67-2012 As per Item Description & directed by Engineer in charge.</p>
63	<p>STOP Sign: -Providing and fixing sign boards made out of 2mm aluminium sheet / 4mm ACP (Aluminium composite Panel); size 90 cms. Octagonal 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 High Intensity Prismatic Grade retro reflective sheeting of Type-4 as per ASTM D-4956 and latest M.O.S.T. Specifications; 3.6mtr long stand post of Iron Angle 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 best quality epoxy coatings in black and white</p>	<p>Cl. No. 806 IRC 67-2012 As per Item Description & directed by Engineer in charge.</p>



	bends. The details of symbol 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 7 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. (B) Class-B Type-4 Retro Reflective sheeting.	
64	Chevron sign: -Providing and fixing sign boards made out of 1.5mm aluminium sheet / 3mm ACP (Aluminium composite Panel); size 60x50cm 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 High Intensity Prismatic Grade retro reflective sheeting of Type-4 as per ASTM D-4956 and latest M.O.S.T. Specifications; 3.3 Mtr. long stand post of Iron Angle 75 x 75 x 6mm / 65NB Circular MS Pipe as required and frame fabricated from suitable size iron angle of 35x35x3mm; painted with best quality 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 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 7 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-B Type-4 Retro Reflective sheeting	Cl. No. 806 IRC 67-2012 As per Item Description & directed by Engineer in charge.
65	Dismantling the existing structure including removing and stacking the dismantled materials as and where directed, (A) R.C.C. work	Cl. No. 202 As per Item Description & directed by Engineer in charge.
66	Dismantling steel work including distempering and stacking the materials with all lead and lift.	Cl. No. 202 As per Item Description & directed by Engineer in charge.
67	Dismantling the C.C. lining including disposing off the dismantled materials as directed etc. complete 150mm Thick	Cl. No. 202 As per Item Description & directed by Engineer in charge.



SECTION – 3: LIST OF APPROVED MAKES OF MATERIALS FOR CIVIL WORKS

Sr.No.	Materials	Makes
1.	Cement	Ambuja, Ultratech, J.K.laxmi, Sanghi
2.	Mild and Tor Steel	SAIL, TATA, Rashtriya Ispat (Visag), JSW Steel Ltd.
3.	Structural Steel	SAIL, Tisco, Essar, JSW Steel Ltd.
4.	Plasticizer /Admixtures (Nanthaline base only)	Sika, CICO, Fosroc, MC –Bauchemie, BASF, SWCL, Fairmate.
5.	Waterproofing Compound	Accord proof Ampermo, Pediproof, CICO, SWCL
6.	Cement paint,	Super Snocem, Nitcocem, Surfacer or equivalents
7.	Epoxy paint	Fosrock, Berger, MC-Bauchemie or Equivalent
8.	Coal Tar Epoxy paint	Fosrock, Berger, MC-Bauchemie, Shalimar
9.	Paints & Distempers	Asian, Berger or Equivalent
10.	Hardners	Ironite, Ferrok, Hardnate
11.	Membrane waterproof	STP Limited / Sanfield (India) Limited
12.	Polysulphide sealants	STP Limited /Pidilite /Choksy Chemicals
13.	Expansion Joints (asphalt filler board)	METCO, Sanfield (India) Limited, MAGEBA and MORTH approved makes.
14.	Waterproofing Polymer	Roofex, Fosroc, SWCL
15.	Stainless Steel	Salem, SAIL
16.	Elastomeric Bearings	Polymer products, METCO, MAGEBA, Killick Nixon and MORTH approved makes.
17.	POT/PTFE Bearings	Sanfield (India) Limited, Dynamic Prestress, MAGEBA, METCO and MORTH approved Makes.
18.	Prestressing Strands	Tata SSL, D>P. Wire, Usha Martin
19.	Prestressing System	Dynamic Prestress, VSL, FPCC, Freyssinet
20.	HDPE Pipe for electrical cable ducts & ducts for prestressing	Rex POLYextrusion Ltd., D.P Wire, Dynamic Prestress
21.	Splicing for reinforcement	Dextra
22.	Silica fume	Elkem
23.	PVC Pipe	Supreme, Jain, Finolex, Prince, Astral
24.	Thermoplast	Asian, Berger
25.	Cat Eye	3M Only
26.	Anti-Carbonation	Asian Paints Ltd; Apurva India Ltd; Berger Paint India Ltd; Buildcore Chemicals Mumbai, Chembond Chemical Ltd; CleanCoat Pvt Ltd; Fairmate Chemical Pvt Ltd; FOSROC Chemicals. Jotun India Pvt Ltd; Sunanda Chemicals Pvt Ltd; Nerolac Paint Ltd;
27.	Fabrication of Steel Girder	RDSO approved vendor



Name of the work: WIDENING OF EXISTING CANAL CULVERT/BRIDGE STRUCTURE ON 60.0 M WIDE D.P. ROAD CONNECTING NATIONAL HIGH WAY IN WEST ZONE (RANDER) AREA

SCHEDULE OF TESTING OF MATERIALS

For ensuring quality control and workmanship various tests prescribe below corresponding to the material concerned shall be taken at periodic intervals as stipulated below be taken.

The Material shall be got tested through Govt. Recognized Laboratory or field Laboratory Approved by Client.

NOTE: These tests shown are minimum required; Actual number of tests will be as per MORT& H/ IRC Specifications and will be as decided by engineer in charge.

It. No.	Material to be tested	Type of test, which shall be carried out.	Frequency @ which test shall be carried out
1	Cement	Consistency, Setting time, compressive strength, Fineness, Chemical Analysis, Soundness	Upto 50 T 1 Test 100 T 2 Tests (As per GERI 200 T 3 Tests Manual 2002) 300 T 4 Tests 500 T 5 Tests 800 T 8 Tests 1300 T 8 Tests and 8 Tests for larger consignment
2	40mm to 63 mm metal [M.C. Metal]	Gradation, Flakiness, Impact Value, Abrasion, Specific Gravity.	One Test Per 100 cum
4	20mm to 40 mm metal [M.C. Metal]	Gradation, Flakiness, Impact Value, Abrasion, Specific Gravity. //	One Test Per 100 cum
5	Kapchi below 20mm	Gradation, Flakiness, Impact Value, Abrasion, Specific Gravity.	One Test Per 100 cum
6	Sand CBR-1 Test per work.	Silt Content Gradation	One Test Per 100 cum
7	40mm nominal size H.B. Metal	Gradation, Flakiness, Impact Value, Abrasion, Specific Gravity.	One Test Per 100 cum
8	Asphalt	1. Penetration Test as per I.S.1203	No. of Tanker Test 1 to 10 1 11 to 20 2 21 to 50 3 51 to 100 4 Remaining every 50 tanker 1
		2. Ductility Test 3. Specification Gravity Test 4. Softening point Test	As per I.S. 1208 As per I.S. 1202 As per I.S. 1204 As per I.S. 1206



It. No.	Material to be tested	Type of test, which shall be carried out.	Frequency @ which test shall be carried out
		5. Viscosity Test	
9	C.C. Cube (M-15 to M-50)	Compressive Strength (I.S. 516-1959)	Qty. C.C.M³ No. of test 1 to 5 - 1 no. 6 to 15 - 2 no. 16 to 30 - 3 no. 31 to 50 - 4 no. 51 & above - 4+1 For each additional 50 M ³ or part thereof).
10	Steel each category	- Tensile Strength, - Yield stress, - Elongation, - Size	1 test / 40 tonnes / per Each category
11	Murrum	PI value	1 Test Per/50cum.
12	Tiles	Abrasion, water absorption, Compressive Strength, size	1 Test For Each Source
13	Water	Chemical Analysis	1 Test For Each Source

For any concrete above M-25Grade, the concrete Mix design shall be carried out through approved laboratory by client. Contractor will have to obtain written permission for that.