

Name of Work :- Bhalej Ode Ahima Road Km 0/00 to 14/700 (FDR, Asphalt Work, CC Road, Structure work, RCC Rainwater Gutter, Crash Barrier and Road Furniture work)

SECTION - 5 TECHNICAL SPECIFICATION

INDEX OF SPECIFICATION

Item No. as per Tender	Description of Item	Applicable Specification	Specification Booklet Attached
1.	Clearing and grubbing road length including uprooting plank, vegetation grass bushes, shrubs, saplings, and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of un serviceable materials. (C) By mechanical means in area of light jungle.	Item No. 1 (C) / P-10 The payment will be made on Hectare basis of the finished work.	Road Work
2.	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 with all lead and lift.	Item No. 9 / P-22	Road Work
3.	Construction of granular Sub base (Grading-I) by providing close graded material BTMC using metal 53 mm to 26.5 mm @ 27.5%, aggregate 26.5 mm to 9.5 mm @ 22.5% & 9.5 mm to 4.75 mm @ 10% and stone dust 4.75 mm & below @ 40% including spreading in uniform layers with motor grader on prepared surface mixing by mix in place method with front end loader at OMC and compacting with vibratory roller to achieve the desired density complete as per MORTH specification.	As per Separate sheet attached herewith	Separate Sheet
4.	Providing, laying, spreading and compacting 250 mm thick (2 layer of 125 mm) graded stone aggregate to Wet Mix Macadam (WMM) specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed material by tripper to site, laying in uniform layers with grader in sub base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density etc. complete as per MORT&H Specification.	As per Separate sheet attached herewith	Separate Sheet
5.	Providing & laying Priming coat with emulsion SS-1 grade and spraying emulsion with spray set fitted on mechanical bouzer using emulsion at the rate of 7.5 KG / 10 Sqm on WMM surface including cleaning the surface etc. complete.	As per Separate sheet attached herewith	Separate Sheet
6.	Providing and laying 20 mm thick Mix seal surface with B.T. aggregate as per MORT&H gradation and specification with asphalt of Grade VG-30 at the rate of 5.09% i.e. 50.9 KG / M.T. by weight of total mix of asphalt for tack coat at 2.5 KG / 10 Sqm including heating & mixing in continuous batch mix plant , transporting the mix spreading the same by sensor paver finisher and consolidation by vibratory roller as per MORT&H specification including cost of all materials fuel, labours, tools and plant etc. using contractor's own machineries, batch mix plant and sensor paver finisher etc. complete.	As per Separate sheet attached herewith	Separate Sheet
7.	Providing and laying Glass fibre Geogrid with Non-Woven Geotextile having tensile strength of 50 kN/m, tack coat with bitumen grade VG-30 and spraying with spray set filled on mechanical sprayer using bitumen at the rate of 5.0 kg / 10 Sqm on surface, including cleaning the surface etc. complete as per instruction of Engineer in charge.	As per Separate sheet attached herewith	Separate Sheet

Item No. as per Tender	Description of Item	Applicable Specification	Specification Booklet Attached
8.	Providing and laying 50 mm thick compacted D.B.M. with B.T. stone aggregates as per MORT&H gradation & specification with bitumen VG-30 for mixing at the rate of 45.00 KG / M.T. by weight of total mix i.e. (4.5% by weight of total mix) & for tack coat at 2.5 KG / 10 Sqm including heating the asphalt & aggregates by continuous batch mix plant & spreading the same by sensor paver finisher including rolling & consolidation with 10-12 tones vibratory and power roller & providing all materials, equipments, tools & plants, fire wood, oil, kerosene, labour charges etc. and using contractor's own machineries, batch mix plant and sensor paver finisher etc. complete.	As per Separate sheet attached herewith	Separate Sheet
9.	Providing and laying 30 mm thick Bituminous Concrete using B.T. aggregate as per MORT&H specification & Bitumen grade VG-30 for mixing at 55.00 KG / M.T. i.e. 5.5% by weight of total mix & for tack coat at 2.5 KG / 10 Sqm including heating the aggregate and asphalt by continuous batch mix plant and spreading the same by sensor paver finisher and consolidation with Pneumatic Roller and power roller including providing all materials equipment, tools and plants, oil, kerosene, firewood, labour charges etc. complete using contractor's own machineries, batch mix plant and sensor paver finisher etc. complete.	As per Separate sheet attached herewith	Separate Sheet
10.	Earthwork for embankment , including breaking clods, dressing with all lead and lift, including watering rolling and consolidation of subgrade in layers at OMC to required dry density, including filling the depression which occur during the process using power roller 8 T to 10 T. (D) From Borrow area within 3.0 KM lead	Item No. 5 / P-16 The item should be carried out as per item description and as per the instruction of Engineer in charge.	Road Work
11.	Providing, laying, and compacting Quarry spall for Road side shoulders including spreading in uniform thickness, rolling with vibratory roller 80-100 kN static weight to proper grade and camber including watering etc. complete.	As per Separate sheet attached herewith	Separate Sheet
12.	Providing and fixing Hectometre stone as per I.R.C. type design including painting, lettering and fixing in C.C. 1:5:10 etc. complete.	Item No. 43 / P-67	Road Work
13.	Providing and fixing Ordinary Kilometer Stone of precast C.C. 1:2:4 including necessary reinforcement as per I.R.C. type design and fixing in C.C. 1:4:8 including letter and paints etc. complete.	Item No. 45 / P-68 The payment will be made on number basis of the finished work.	Road Work
14.	Providing and fixing 5th Kilometer stone of precast C.C. 1:2:4, including necessary reinforcement as per I.R.C. type design and fixing in C.C. 1:4:8, including painting, lettering etc. complete.	Item No. 46 / P-68 The payment will be made on number basis of the finished work.	Road Work
15.	Providing and fixing guard stone as per I.R.C. type design including white washing and fixing in C.C. 1:5:10 etc. complete.	Item No. 44 / P-67 + Item No. 43 / P-67. Except that Guard stone shall be fixed in C.C. 1:5:10 as directed.	Road Work
16.	Providing and fixing Indicator stone of approved stone as per I.R.C. type design in C.C. 1:4:8, including white washing and fixing in C.C. 1:5:10 etc. complete.	Item No. 47 / P-68 The payment will be made on number basis of the finished work.	Road Work

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17.	Providing and fixing Direction (Junction) sign boards made out of 2 mm aluminium sheet / 4 mm ACP (Aluminium composite Panel); size 244 x 122 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; reflectorized with Micro Prismatic Grade retro reflective sheeting of Type-11 as per ASTM D-4956 and latest M.O.S.T. Specifications; 4.0 mtr long (2 Nos) stand post of 75 x 75 x 6 mm / 65NB Circular MS pipe as required and frame fabricated from suitable size iron angle of 50 x 50 x 5 mm; 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 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.	As per separate sheet attached herewith.	Separate sheet
18.	Providing and fixing Cautionary Warning sign boards made out of 2 mm aluminium sheet / 4 mm ACP (Aluminium composite Panel); size 90 x 90 x 90 cm 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; reflectorized with Micro Prismatic Grade retro reflective sheeting of Type-11 as per ASTM D-4956 and latest MOST specifications; 3.6 mtr long stand post of 75 x 75 x 6 mm / 65NB circular MS pipe as required and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm; 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 cm for each leg, including excavation, curing etc. complete under the supervision of Engineer in charge. A warranty for 10-year 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.	As per Separate sheet attached herewith	Separate sheet

Item No. as per Tender	Description of Item	Applicable Specification	Specification Booklet Attached
19.	Providing and fixing Village name / Bump Ahead Sign boards made out of 2 mm aluminium sheet / 4 mm ACP (Aluminium composite Panel); size 90 x 60 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; reflectorized with Micro Prismatic Grade retro reflective sheeting of Type-11 as per ASTM D-4956 and latest MOST Specifications; 3.3 mtr long stand post of 75 x 75 x 6 mm / 65NB circular MS pipe as required and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm; 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.	As per separate sheet attached herewith.	Separate sheet
20.	Providing and fixing Facility Informatory sign boards made out of 2 mm aluminium sheet / 4 mm ACP (Aluminium composite Panel); size 80 x 60 cm 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; reflectorized with Micro Prismatic Grade retro reflective sheeting of Type-11 as per ASTM D-4956 and latest MOST Specifications; 3.6 mtr long stand post of 75 x 75 x 6 mm / 65NB Circular MS pipe as required and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm; 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 cm 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.	As per separate sheet attached herewith.	Separate sheet

Item No. as per Tender	Description of Item	Applicable Specification	Specification Booklet Attached
21.	Providing and fixing Hazard Marker Sign boards made out of 1.5 mm aluminium sheet / 3 mm ACP (Aluminium composite Panel); size 90 x 30 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; reflectorized with Micro Prismatic Grade retro reflective sheeting of Type-11 as per ASTM D-4956 and latest MOST Specifications; 1.8 mtr long stand post of 75 x 75 x 6 mm / 65NB circular MS pipe as required and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm; 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 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.	As per separate sheet attached herewith	Separate sheet
22.	Providing and fixing Regulatory / Mandatory sign boards made out of 2 mm aluminium sheet / 4 mm ACP (Aluminium composite Panel); size 60 cm dia circle 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; reflectorized with Micro Prismatic Grade retro reflective sheeting of Type-11 as per ASTM D-4956 and latest MOST Specifications; 3.6 mtr long stand post of 75 x 75 x 6 mm / 65NB circular MS pipe as required and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm; 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 cm 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.	As per separate sheet attached herewith.	Separate sheet

Item No. as per Tender	Description of Item	Applicable Specification	Specification Booklet Attached
23.	Providing and fixing Chevron sign boards made out of 1.5 mm aluminium sheet / 3 mm ACP (Aluminium composite Panel); size 60 x 50 cm 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; reflectorized with Micro Prismatic Grade retro reflective sheeting of Type-11 as per ASTM D-4956 and latest MOST Specifications; 3.3 mtr long stand post of 75 x 75 x 6 mm / 65NB circular MS pipe as required and frame fabricated from suitable size iron angle of 50 x 50 x 5 mm; 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 10-year 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.	As per separate sheet attached herewith.	Separate sheet
24.	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 colour of the marker should be as per the IRC 35-2015 and as directed by Engineer in charge.	As per separate sheet attached herewith	Separate sheet

Item No. as per Tender	Description of Item	Applicable Specification	Specification Booklet Attached
25.	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 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.	Item No. 40 / P-64 The payment will be made on square meter basis of the finished work.	Road Work
26.	Providing and laying rumble strip road marking with hot applied thermoplastic paints with reflectorizing glass beads on bitumen surface by providing hot applied thermoplastic compound 8 mm thick including reflectorizing glass beads @ 250 gms per Sqm area, thickness of 8 mm is excluding of surface applied glass beads as per IRC: 35-2015. The finished surface to be level, uniform and free from streaks and holes etc. complete.	Item No. 40 / P-64 Thermoplastic paint for rumble strip shall be applied in continuous lines of uniform thickness of at least 8 mm unless specified otherwise. The payment will be made on square meter basis of the finished work.	Road Work
27.	Providing and fixing Tree Guard sign board made out of 2 mm aluminium sheet / 3 mm ACP (Aluminium composite Panel), size 30 cms diameter circle, pre-treated with phosphating process and acid etching, painted with one coat of epoxy primer and two coats of best quality epoxy paint reflectorized 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.	As per separate sheet attached herewith	Separate sheet
28.	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 fittings to be galvanized 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) etc. complete as per instruction of Engineer in charge.	As per separate sheet attached herewith	Separate sheet

Item No. as per Tender	Description of Item	Applicable Specification	Specification Booklet Attached
29.	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam (Grade-I) (B.T. Metal of size 63 to 45 mm) specification including spreading in uniform thickness, hand packing, rolling with vibratory roller in stages to proper grade and camber, applying and brooming requisite type of screening / binding materials to fill-up the interstices of coarse aggregate, watering and compacting to the required density etc. complete as per MORT&H Specification.	As per separate sheet attached herewith	Separate sheet
30.	Construction of dry lean cement concrete Sub-base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 150 KG / Cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a concrete sensor paver method, compacting with 8-10 tonne vibratory roller, finishing and curing etc. complete.	As per separate sheet attached herewith	Separate sheet
31.	Construction of 250 mm thick un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with concrete grade M-300 and with cement @ 410 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, Separation Membrane of impermeable plastic sheeting 125 micron thick, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, Plastic sheath, 1.25 mm thick for dowel bars, finishing to lines and grades as per drawing etc. complete as per instruction of Engineer in charge.	As per separate sheet attached herewith	Separate sheet
32.	Supplying and fixing reinforced concrete heavy duty non-pressure pipes with collars for culverts carrying heavy traffic as per IS 458-1991 specifications, including setting the pipes in C.M. 1:2 watering and laying (to level or slopes) of class NP-3 of following internal diameters. (i) 300 mm diameter .	Item No. 63 (i) / P-74. The payment will be made on running meter basis of the finished work.	Road Work
33.	Providing and fixing pre-cast concrete kerb stone of grey cement based concrete block 30 cm length, 30 cm height and 15 cm thick of M-250 grade concert as per approved design and including excavation for fixing in proper line and level, filling the joint with C:M 1:3 (1 cement : 3 fine sand) including Yellow and Black painting with one coat of priming coat and two coats of oil painting etc. complete.	As per separate sheet attached herewith	Separate sheet

Item No. as per Tender	Description of Item	Applicable Specification	Specification Booklet Attached
34.	Providing and fixing pre-cast Rubber Dye / Steel dye inter locking concrete block 60 mm thick with grade of concrete M-300 pneumatic compressed / vibrated by 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.	As per separate sheet attached herewith	Separate sheet
35.	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. For all depth with all lead and lift.	As per separate sheet attached herewith	Separate sheet
36.	Providing and casting in situ ordinary cement concrete M-100 mix and providing necessary pin headers including shuttering, scaffolding, laying, vibrating, curing and finishing complete with V-Groves. For all Height as directed.	As per separate sheet attached herewith	Separate sheet
37.	Providing and casting in-situ controlled cement concrete M-200 for R.C.C. Return as per drawings including centering shuttering, scaffolding where necessary, laying vibrating, curing and finishing etc. complete. For all Height as directed (1) Piers (2) Abutment (3) RCC Return	As per separate sheet attached herewith	Separate sheet
38.	Providing and fixing in position FE-500D T.M.T. bar reinforcement including cutting, bending and tying complete as per detailed drawings. (A) R.C.C. Kerb (B) R.C.C. Footpath (C) R.C.C. Approach slab (D) Wearing Coat etc. complete.	As per separate sheet attached herewith	Separate sheet
39.	Providing and 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.	As per separate sheet attached herewith	Separate sheet
40.	Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification.	As per separate sheet attached herewith	Separate sheet
41.	Providing Uncoursed rubble stone pitching in Cement Mortar 1:5 for flooring including curing pointing in Cement Mortar 1:3 on exposed faces complete etc. complete as per instruction of Engineer in charge.	As per Separate sheet attached herewith	Separate Sheet

Dated Signature of
the Contractor.


Deputy Executive Engineer
R & B Sub Division,
ANAND.


Executive Engineer
R & B Division,
ANAND.