Name of Work :-

M&R work for Premonsoon Work-2026 of various Roads Under Kadi-2 Section of R & B Sub Division, Kadi, Dist. Mehsana.

Index to Specification

1. **General Technical Specification**
2. **Specification for materials**

	continuous batching drum mix plant, transporting the mix and spreading the same by paver finisher & consolidation with vibratory roller & flushing sand @ 0.30 Cum/100 Smt. including providing all materials equipments, tools & plants , fire wood, oil , kerosene, labour charges etc. complete using contractor's own machinery drum mix plant & paver finisher etc. complete.	No. 39, Pg. 63
7	Providing & Laying 20 mm thick Mix Seal Surfacing using stone chipping as per MORT & H gradition & specification & Asphalt grade VG- 30 for mixing @ 50.90 Kg./ M.T. i.e. 5.09 % by Weight of total mix including heating the aggregate in continuous batching drum mix plant, transporting the mix and spreading the same by manually finisher & consolidation with vibratory roller & flushing sand @ 0.30 Cum/100 Smt. including providing all materials equipments, tools & plants , fire wood, oil , kerosene, labour charges etc. complete using contractor's own machinery drum mix plant & paver finisher etc. complete.	Road Booklet It. No. 39, Pg. 63
8	Chevron sign :-Providing and fixing sign boards made out of 1.5mm aluminium sheet / 3mm ACP (Aluminum composite Panel); size 60x50 cm 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 refiectivesheeting 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 originaa 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 It. No. 9
9	Curve/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 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 refiectivesheeting 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	Road Booklet It. No. 50, Pg. 70
10	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 phospheting process & acid etching; coated with one coat of epoxy primer and two coats of best quality	Road Booklet It.

	epoxy paint ;reflectorised with Micro Prismatic Grade retro refiectivesheeting 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	No. 52, Pg. 71
11	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 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 refiectivesheeting 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 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 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 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	Road Booklet It. No. 49, Pg. 70
12	Supplying and fixing jumbo bollard swiss type made out of 1.5 mm crc sheet , hight 188 cms bottom dia. 30 cm, top dia. 18 cm. with direction plate of 45 cm dia. Fabricated as per drawing pretreated with phosphering process painted with epoxy coating, reflectorised with retro reflective sheeting specified by MORT&H latest specification and fixing in size 45cm x 45 cm x 60 cm in concrete grade 1:2:4 (1 cement :2 fine sand :4 aggregate as specified by Engineer Incharge. (B) High Intensity Grade.	As per Attached Sheet
13	Road marking with hot applied thermoplastic paints with reflectorising glass beads on bitumin surface providing and laying a hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250gms per sqm area, thickness of 2.5mm is excluding of surface applied glass beds as per IRC:35-2015. The finished surface to be level, uniform and free from streaks and holes. zebra patta /bump patta lane/center line/ edge line/cut patta. The white color marking should provide liminance coefficinet on cemend road shalll be min 130 mcd/m2/lux and Asphalt road shall be min 100 mcd/m2/lux during the service life during the day time. The marking should meet the performance criteria for night time reflectivity, wet reflectivity and skid resistance as mentioned in the section-15 of IRC 35-2015. Warranty for the Retro reflectivity should be two years.	Road Booklet It. No. 40, Pg. 64

14	*Providing and fixing pre-cast concrete kerb stone of gray cement based concrete block 30cm length,30cm height and 15cm thick of M250 grade concret as per approved design and including excavation for fixing in proper line and level,filling the joint with C:M 1:3 (1cement:3fine sand) etc complete.*	*As per Attached Sheet*
15	*Providing oil paint colour to Center verge (Kerb) by Yellow and Black patta (Three Coat) one coat of priming & two coat of oil Paint including cost of material required for paint and all labour work etc complete as per direction.*	*Road Booklet It. No. 55, Pg. 71*
16	*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.*	*Road Booklet It. No. 41, Pg. 66*
17	*Providing and laying asphalt painting on BT surface with bitumen grade VG-30 at the rate of 5 Kg /10 Sqm. By mechanical sprayer and spreading the stone dust on prepared surface at the rate of 0.03 Cum. / 10 Sqm. etc. complete and rolling with roller and brushing etc. complete.*	*As per Attached Sheet*

Dy. Executive Engineer
R & B Sub Division
Kadi

Name of Work :-

Kadi- 2

M&R work for Premonsoon Work-2026 of various Roads Under ~~Becharaji~~ & ~~Jotana~~ Section of R & B Sub Division, Kadi, Dist. Mehsana.

GENERAL TECHNICAL SPECIFICATION

1.0 GENERAL :

All Measurements shall be made in the metric system. Different items of work shall be measured in accordance with the procedures set forth in the relevant sections read in conjunction with General Conditions of Contract. The same shall not however apply in the case of lump-sum items. All measurements and computations unless otherwise indicated, shall be carried nearest to the following limits :

(i)	*Length and breadth*	*10 mm*
(ii)	*height, depth or thickness of earthwork Sq.Mt.*	*5 mm*
	sub-base, bases. surfacing, and structural members	
(iii)	*Areas*	*0.01 Sq. mt.*
(iv)	*Cubic contents*	*0.01 Cu.mt.*

in recording dimensions of work the sequence of length, width and height ordepth or thickness shall be followed.

2.0 MEASUREMENT OF LEAD FOR MATERIALS

Where lead is specified in the contract for construction materials.the sameshall be measured as described hereunder.

Lead shall be measured over the shortest practicable route and not the oneactually taken and the decision of the Engineer-in-charge in this regard shall betaken as final. Distance upto and including 100 meters shall be measured inunits of 50 metres, exceeding 100 metres but not exceeding 1 KM, in units of100 metres, and exceeding 1 Km, in units of 500 metres. The half and greaterthan half of the units shall be reckoned as one and less than half of the unitsignored. In this regard, the source of the material shall be divided into suitableblocks and for each block the distance from the centre of the block to the centreof placing pertaining to that block shall be taken as the lead distance.

3.0 SURFACE REGULARITY OF SUBGRADE &PAVEMENT COURSES :

The surface regularity of completed sub-base courses and wearing surfacesin the longitudinal and transverse directions shall be within the tolerancesindicated in table below. The longitudinal profile shall be checked with a 3 metrelong straight edge, at the middle of each traffic lane along a line parallel to thecentre line of the road. The transverse profile shall be checked with a set forthree camber boards at intervals of 10 metres.

Permitted tolerance of surface regularity for pavement courses

Sr.	*Type of Construction*	*Longitudinal Profile with 3 meter straight edge*					*Cross Profile*
		Maximum Permissible Undulation in mm	*Maximum number of undulation permitted in any 300 m length exceeding in mm*				*Maximum permissible variation from specified profile camber template mm*
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1	*Earth sub-grade*	*36*	*30*	*--*	*--*	*--*	*15*
2	*Granular/lime / Cement Stabilized Sub-base*	*23*	*--*	*30*	*--*	*--*	*12*
3	*Water Bound Macadam with nominal size metal {20 – 50 mm}*	*18*	*--*	*--*	*30*	*--*	*8*
4	*Semi Dense carpet @@*	*18*	*--*	*--*	*--*	*20*	*6*

Notes :

1. *@ @ These are for machine laid surfaces. If laid manually, due to unavoidable reason, tolerance upto 50 percent above these values in this column may be permitted. However, this relaxation does not apply to the values of maximum undulation for longitudinal and cross profiles mentioned in columns 3 and 8 in the* ***TABLE.***
2. *Surface evenness requirements in respect of both the longitudinal and cross profiles should be simultaneously satisfied.*

3. *Rectification : Where the surface irregularity of sub-grade and the various pavement courses fall outside the specified tolerances, the contractor shall be liable to rectify these in the manner described below and to the satisfaction of the Engineer-in-charge at his own cost.*

(i) Sub-grade

Where the surface is high, it shall be trimmed and suitably compacted. Where the same in low, the deficiency shall be corrected by adding fresh material The degree of compaction and the type of material to be used shall conform to the specified requirements.

(ii) Granular1 Sub- base :

Same as at (i) above except that the degree of compaction and the type of material to be used shall conform to the specified requirements.

(iii) Lime l Cement stabilized soil sub-base

For Lime/ Cement treated materials where the surface is high, the same shall be suitably trimmed while taking care that the material below is not disturbed due to this operation. However, where the surface is low. the same shall be corrected as described herein below.

For cement treated material, when the time elapsed between detection of irregularity and the time of mixing of the material, is less then2 hours. The surface shall be scarified to a depth of 50mm, supplemented with freshly mixed material as necessary and recomposed to the relevant specification. When this time is more than 2 hour, the full depth of the layer shall be removed from the pavement and replaced with fresh material, to specification. In either case, the area treated shall not be less than 5 metres long by 2 metres wide. This shall also apply to lime treated material except that the time criterion shall be 3 hours instead of 2 hours.

(iv) Water Bound Macadam Base :

Where the surface is high or low.that top 75mm shall be scarified. reshaped with added material as necessary and re-compacted The area treated at a place shall not be less than 5 metres long and 2 metres wide.

(V) Bituminous Construction :

For bituminous constructions, other than wearing course, where the surface is low.the deficiency shall be corrected by adding fresh material and re-compaction to specifications. Where this surface is high, the full depth of the layer shall be removed and replaced with fresh material and compacted to specifications. For wearing course, where the surface is high or low.the full depth of the layer shall be removed and replaced with fresh

material and compacted to specifications in all cases where the removal and replacement of a bituminous layer is involved, the area treated shall not be less than 5 metre long and not less than 1 lane wide.

4. QUALITY CONTROL TEST DURING CONSTRUCTION :

The materials supplied and the works carried out by the Contractor shall conform to the enclosed relevant specifications. For ensuring the requisite quality of construction, the materials and works shall be subjected to quality control test as described hereinafter, by the Engineer-in-charge. The testing frequencies set forth are the desirable minimum and the Engineer-in-charge shall have the full authority to carry out test as frequently as he may deem necessary to satisfy that the materials at work Comply with the appropriate specifications. Test procedures for the various quality control tests are indicated in the respective sections of the specification or for certain tests within this section. Where no specific testing procedure is mentioned, the test shall be carried out as per prevalent accepted engineering practice to the directions of the Engineer-in-charge

5. TESTS ON EARTH WORK OF EMBANKMENT CONSTRUCTION :

5.1 Borrow Material :

(a) Sand Content (IS :2720 Part IV)
Two test per 8000 Cubic metres of soil

(b) Plasticity Test (IS : 2720 Part-V)
Each type to be tested.
Two tests per 8000 Cubic Metres of soil.

(c) Density test (IS : 2720 Part VII)
Each soil type to be tested.
Two tests per 8000 Cubic Metres of soil.

(d) Moisture Content Test (IS :2720 Part -11)
One test for every 250 Cubic Metres of soil.

5.2 Compaction Control :

Control shall be exercised by taking at least one measurement of density for each 1000 square metres of compacted area, or closer as required lo yield !lie minimum number of test results for evaluating day's work on statistical basis. The determination of density shall be accordance with IS : 2720 (Part XXVIII). Test locations shall be chosen only through random sampling techniques. Control shall not be based on the result of any one test but on the mean value of a set of 5-10 density determinations. The number of tests in one set of measurements shall be 5 as long as it IS felt that sufficient control over borrow material and the method of compactions is being exercised. If considerable variations are observed between individual density results, the minimum number of tests in one set of measurement shall be increase to 10.. The acceptance of

work shall be subject to the condition that the mean dry density equals or exceeds the specified density and the standard deviation for any set of results is below 0.08 gm/cc. However for earthwork in shoulders and in top 500 mm portion of the embankment below the subgarde, at least one density measurement shall be taken for every 500 square meters of the compacted area provided further that the number of the tests in each set of measurement shall be at least 10. In other respects, the control shall be similar to that described earlier.

6. Following materials shall conform to the Indian Standards shown againstthem :

(1)	*Cement*	*IS : 269*
(2)	*Sand for masonary*	*IS 2116*
(3)	*Sand for Concrete*	*IS 383*
(4)	*Coarse aggregates*	*IS 383*
(5)	*Mild Steel*	*IS 432*
(6)	*High yield strength deformed bars*	
	(a) Hot Rolled	*IS : 1139*
	(b) Cold Twisted	*IS : 1786*

7. BARREL THICKNESS OF PIPES OF DIFFERENT CLASS SHALL BE ASUNDER

Sr. No.	***internal Diameter of pipe in mm***	***Barrel thickness (in mm)***		
		NP1	***NP2***	***NP3***
1	*80*	*25*	*25*	*--*
2	*100*	*25*	*25*	*--*
3	*150*	*25*	*25*	*--*
4	*250*	*25*	*25*	*--*
5	*300*	*30*	*30*	*--*
6	*350*	*32*	*32*	*75*
7	*400*	*32*	*32*	*75*
8	*450*	*35*	*35*	*75*
9	*500*	*--*	*35*	*75*

10	600	--	40	80
11	700	--	40	80
12	800	--	45	90
13	900	--	50	100
14	1000	--	55	100
15	1100	--	60	115
16	1200	--	65	115

SPECIFICATION FOR MATERIALS

M-1 Water:

1.1 Water shall not be salty or brackish and shall be clean, reasonably clear and free from objectionable quantities of silt and traces of oil and injurious alkalis, salts, organic matter and other deleterious material which will either weaken the mortar or concrete or cause effloresence or attack the steel in R.C.C. Container for transport, storage and handling of water shall be clean. Water shall conform to the standards specified in LS. 456-1978.

1.2 If required by Engineer-in-charge it shall be tested by comparison with distilled water. Comparison shall he made by means of standard cement tests for soundness, time of setting and mortar strength as specified in LS. 269-1976. Any indication of unsoundness, change in time of setting by 30 minutes or more or decrease of more than 10 per cent in strength of mortar prepared with water sample when compared with the results obtained with mortar prepared with distilled water shall be sufficient cause for rejection of water under test.

1.3 Water for curing mortar, concrete or masonary should not be too acidic or too alkaline. It shall be free of elements which significantly affect the hydration reaction or otherwise interfere with the hardening of concrete during curing or those which produce objectionable stains or other unsightly deposits on concrete or mortar surfaces.

1.4 Hard and bitter water shall not be used for curing.

1.5 Potable water will be generally found suitable for curing mortar or concrete.

M-2 Lime:

2.1 Lime shall be hydraulic time as per I.S. 712-1973. Necessary test shall be carried out as per I.S.6932 (Parts I to X), 1973.

2.2 The following field tests for limes are to be carried out:

(1) A very rough idea can be formed about the type of lime by its visual examination i.e. fat lime bears pure white colour, lime in form of porous lumps of dirty while colour indicates quick lime, and solid lumps are the un burnt lime stone.

(2) Acid tests for determining the carbonate content in lime, excessive amount of impurities and rough determination of class of lime.

2.3 Storage shall comply with I.S. 712-1973. The slaked lime, if stored, shall be kept in a weather proof and damp-proof shed with impervious floor and sides to protect it against rain, moisture, weather and extraneous materials mixing with it. All lime that has been damaged in any way shall be rejected and all rejected materials shall be removed from site of work.

2.4 Field testing shall be done according to I.S. 1624-1974 to show the acceptability of materials.

M-3 Cement:

3.1 Cement shall be ordinary Portland slag cement as per LS. 269-1976 or Portland slag cement as pr I.S. 455-1976.

M-4 White Cement:

4.1 The white cement shall conform to I.S. 80412-E 1978.

M-5 Coloured Cement:

5.1 Coloured cement shall be with white or gray Portland cement as specified in the item of the work. 5.2 The pigments used for coloured cement shall be of approved quality and shall not-exceed l0 % of cement used in the Mix. The mixture of pigment shall be properly grounded to have a uniform colour and shade. The pigments shall have such properties to provide for durability under exposure to sunlight and weather.

5.3. The pigment shall have the property such that it is neither affected by the cement nor detrimental to it.

M-6 Sand:

6.1. Sand shall be natural sand, clean, well graded, hard strong durable and gritty particle free from injurious amounts of dust clay, kankar nodules, soft or flaky particles shale, alkali; salts organic, matter, loam, mica or other deleterious substance and shall be got approved from the Engineer-in Charge. The sand shall not contain wore than 8 percent of silt as determined by field test, if necessary the sand shall be washed to make it clean.

6.2. Coarse Sand:

The fineness modulus of coarse sand shall not be less than 2.5 and shall not exceed 3.0. The sieve analysis of coarse shall be as under:

I. S. Sieve Designation	***Percentage by weight passing sieve***	***I. S. Sieve Designation***	***Percentage by weight passing sieve***
4.75mm	*100*	*600 Micron*	*30-10*
2.36mm	*90-100*	*300 Micron*	*5-70*
1.18mm	*70-100*	*150 Micron*	*0-50*

6.3 Fine Sand:

The fineness modulus shall not exceed 1.0. The sieve analysis of fine sand shall be as under

I. S. Sieve Designation	***Percentage by weight passing sieve***	***I. S. Sieve Designation***	***Percentage by weight passing sieve***
4.75mm	*100*	*600 Micron*	*40-85*
2.36mm	*100*	*300 Micron*	*5-50*
1.18mm	*70-100*	*150 Micron*	*0-10*

M-7 Stone Dust:

7.1 *This shall be obtained from crushing hard black trap or equivalent. It shall not contain more than 8% of silt as determined by field test with measuring cylinder. The method of determining silt contents by field test is given as under*

7.2 *A sample of stone dust to be tested shall be placed without drying in 200 mm. measuring cylinder. The quantity of the sample shall be such that it fills the cylinder up to 100 mm. mark. The clean water shall be added up to 150 mm. mark. The mixture shall be stirred vigorously and the content allowed to settle for 3 hours.*

7.3. *The height of silt visible as settled layer above the stone dust shall be expressed as percentage of the height of the stone dust below. The stone dust containing more than 8% silt shall be washed so as to bring the silt content within the allowable limit.*

7.4. *The fineness modulus of stone dust shall not be less than 1.80.*

M-8 Stone Grit:

8.1. *Grit shall consist of crushed or broken stone and be hard strong, dense, durable, clean, of proper gradation and free from skin or coating likely to prevent adhesion of mortar Grit shall generally be cubical in shape and as far as possible flaky elongated pieces shall be avoided. It shall generally comply with the provisions of I.S. 383-1970. Unless special stone of particular quarries is mentioned, grit shall be obtained from the best black trap or equivalent hard stone as approved by the Engineer-in-charge. The grit shall have no deleterious reaction with cement.*

8.2. *The grit shall conform to the following gradation as per sieve analysis:*

I.S. Sieve Designation	Percentage by weight passing through sieve
12.50 mm	100 %
10.00 mm	80-100 %
4.75 mm	0-20 %
2.36 mm	0-25 %

8.3. The crushing strength of grit will be such as to allow the concrete in which it is used to built-up the specified strength of concrete.

8.4. The necessary tests for grit shall carried out as per the requirements of I.S. 2386 (Parts I to VII) 1963, as per instructions of the Engineer-in-charge. The necessity of test will be decided by the Engineer-in-charge.

M-9 Cinder:

9.1 *Cinder is well burnt furnace residue which has been fused or sintered into lumps of varying sizes.*

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

9.3. *The average grading for cinder aggregates shall be as mentioned below:*

I.S. Sieve Designation	*Percentage passing*
20 mm	*100*
10 mm	*86*
4.75 mm	*70*
2.36 mm	*52*

M-10 Lime Mortar:

10.1. *Lime shall conform to specification M-2. Water shall conform to specificationM-1. Sand shall conform to specification M-6.*

10.2. *Proportion of Mix:*

10.2.1. *Mortar shall consist of such proportions of slaked lime and sand as may bespecified in the item. The slaked lime and sand be measured by volume. .*

10.3. *Preparation of mortar:*

10.3.1. *Lime mortar shall be prepared by wet process as per I.S. 1625-1971. Powerdriven mill shall be used for preparation of lime mortar. The slaked lime shall beplaced in the mill in an even layer and grind for the 180 revolutions with sufficientwater. Water shall be added as required during grinding (care being taken not toadd more water) that will bring the mixed material to a consistency of stiff paste.Thoroughly wetted sand shall then be added evenly and the mixture ground foranother 180 revolutions.*

10.4 *Storage:*

10.4.1 *Mortar shall always be kept damp, protected from sun and rain till used up,covering it by tarpaulin or open sheds.*

10.5 *Use:*

10.5.1. *All mortar shall be used as soon as possible after grinding. It should be usedon the day on which it is prepared, but in no case mortar made earlier than 36 hoursshall be permitted for use.*

M-11 Cement Mortar:

11.1. Water shall conform to specification M-1. Cement shall conform tospecification M-3. Sand shall conform to M-6. 11.2. Proportion of Mix:

11.2.1: Cement and sand shall be mixed to specified proportion, sand beingmeasured by measuring boxes. The proportion of cement will be by volume on thebasis of 50 Kg. / Bag of cement being equal to 0.0342 Cu.m. The mortar may behand mixed or machine mixed as directed.

11.3. Preparation of mortar:

11.3.1 In hand mixed mortar cement and sand in the specified proportions shall bethoroughly mixed dry on a clean impervious platform by turning over at least 3 timesor more till a homogenous mixture of uniform colour is obtained. Mixing platformshall be so arranged that no deleterious extraneous material shall get mixed withmortar or mortar shall flow out. While mixing, the water shall be gradually addedand thoroughly mixed to form a stiff plastic mass of uniform colour so that eachparticle of sand shall be completely covered with a film of wet cement. The watercement ratio shall be adopted as directed.

11.3.2 The mortar so prepared shall be used within 30 minutes of adding water.Only such quantity of mortar shall be prepared as can be used within 30 minutes.

M-12 Stone Coarse Aggregate for Nominal Mix Concrete:

12.1. Coarse aggregate shall be machine crushed stone of black trap or equivalentand be hard, strong, dense, durable, clean and free from skin and coating likely toprevent proper adhesion ofmortar.

12.2. The aggregate shall generally be cubical in shape. Unless special stones ofparticular quarries are mentioned aggregates shall be machine crushed from thebest black trap or equivalent hard stone as approved. Aggregate shall have nodeleterious reaction with cement. The size of the coarse aggregate for plain cementconcrete and ordinary reinforced cement concrete shall generally be as per thetable given below. However in case of reinforced cement concrete the maximumlimit may be restricted to 6 mm. less than the minimum lateral clear distancebetween bars or 6 mm. less than the cover, whichever is smaller.

TABLE

I. S. Sieve Designation	Percentage passing for Single sized aggregates of Nominal size			I. S. Sieve Designation	Percentage passing for Single sized aggregates of Nominal size		
	40 mm	20 mm	40 mm		40 mm	20 mm	40 mm
80 mm	--	--	--	12.5 mm	--	--	--
63 mm	100	--	--	10 mm	0.5	0.02	0.30
40 mm	85-100	100	--	4.75 mm	--	0.5	0.5
20 mm	0-20	85-100	100	2.35 mm	--	--	--
16 mm	--	--	85-100				

Note: *This percentage may be varied somewhat by Engineer-in-charge when considered necessary for obtaining better density and strength of concrete.*

12.3. *The grading test shall be taken in the beginning and at the change of source of materials. The necessary test indicated in I.S. 383-1970 and I.S. 456-1978 shall have to be carried out to ensure the acceptability. The aggregates shall he stored separately and handled in such a manner as to prevent the intermixing of different aggregates. If the aggregates are covered with dust, they shall be washed with water to make them clean.*

M-13 Black Trap or Equivalent Hard Stone Coarse Aggregate:

13.1. *Aggregate For Design Mix Concrete: Coarse aggregate shall be of machine crushed stone of black trap or equivalent hard stone and be hard strong dense durable clean and free from skin and coating likely to prevent proper adhesion of mortar.*

13.2. *The aggregates shall generally be cubical in shape. Unless special stones of particular quarries are mentioned, aggregates shall be machine crushed from the best, black trap or equivalent hard stones as approved. Aggregate shall have no deleterious reaction with cement.*

13.3. *The necessary tests indicated in I.S. 383-1970 and I.S. 456-1978 shall have to be carried out to ensure the acceptability of the material.*

13.4. *If aggregate is covered with dust it shall be washed with water to make it clean.*

M-14 Brick Bats Aggregate:

14.1. Brick bat aggregate shall be broken from well burnt or slightly over burnt and dense brick. It shall be homogeneous in texture roughly cubical in shape, clean and free from dirt of any other foreign material. The brick bats shall be of 40 mm. to 50 mm. size unless otherwise specified in the item. The under burnt of over burnt brick bats shall not be allowed.

14.2. The brick hats shall be measured by volume by suitable boxes or as directed.

M-15 Brick:

15.1. The bricks shall be hand or machine molded and made from suitable soils and kiln-burnt. They shall be free from crack and nodules of free lime. They shall have smooth rectangular faces with-sharp corners and shall be of uniform colour. The bricks shall be molded with a frog of 100 mm. x 40 mm. and 10 mm. to 20 mm. deep on one of its flat sides. The bricks shall not break when thrown on the ground from a height of 600 mm.

15.2. The size of modular bricks shall be 190 mm. x 90 mm. x 90 mm.

15.3. The size of the conventional bricks shall be as under:
(9" x 4 3/8 " x 2 ¾ ") i.e. 225 x 110 x 75 mm.

15.4. Only bricks of one standard size shall be used on one work. The following tolerances shall be permitted in the conventional size adopted in a particular work. Length ± 1/8" (3.0 mm) Width ± 1/16" (1.50 mm) Height ± l/6" (1.50 mm.)

15.5. The crushing strength of the bricks shall not be less than 35 Kg./Sq.Cm. The average water absorption shall not be more than 20 percent by weight. Necessary tests for crushing strength and water absorption etc. shall be carried out as per I.S. 3495 (Part-I to IV) 1976.

M-16 Stone:

16.1. The stone shall be of the specified variety such as Granite/Trap Stone/Quartzite or any other type of good hard stones.

The stones shall he obtained only from the approved quarry and shall be hard, sound, durable and free from defects like cavities, cracks, sand holes, flaws, injurious veins, patches of loose or soft materials etc. and weathered portions and other structural defects or imperfections tending to affect their soundness and strength. The stone with round surface shall not be used. The percentage of water absorption shall not be more than 5%

of dry weight, when tested in accordance with I.S. 1134- 1974. The minimum crushing strength of the stone shall be 200 Kg. / Sq.Cm unless otherwise specified.

16.2 *The samples of the stone to be used shall be got approved before the work is started.*

16.3 *The Khanki facing stone shall be dressed by chisel as specified in the item for Khanki facing in required shape and size. The face of stone shall be so dressed that the bushing on the exposed face shall not project by more than 40 mm. from the general wall surface and on face to be plastered it shall not project by more than 19 mm. nor shall it have depressions more than 10 mm. from the average wall surface.*

M-17 Laterite stone:

17.1. *Laterite stone shall be obtained from the approved quarry. It shall be compacted in texture, sound, durable and free from soft patches. It shall have a minimum crushing strength of 100 Kg. /Sq.Cm. in its dry condition. It shall not absorb water more than 20% of its own weight, when immersed for 24 hours in water. After quarrying the stone shall be allowed to weather for some time before using in work.*

17.2. *The stone shall he dressed into regular rectangular blocks so that all faces are free from waviness and unevenness, edges true and square.*

17.3. *Those types of stone in which white clay occur, should not be used.*

17.4. *Special corner stones shall be provided where so directed.*

M-18 Mild Steel Bars:

18.1 *Mild steel bars reinforcement for R.C.C. work shall conform to I.S. 432 (Part-II) 1966 and shall be of tested quality. It shall also comply with relevant part of I.S. - t56- 1978.*

18.2 *All the reinforcement shall be clean and free from dirt, paint, grease, mill scale or loose or thick rust at the time of placing.*

18.3. *For the purpose of payment, the bar shall be measured correct up to 100 mm. length and weight payable worked out at the rate specified below:*

Sr. No.	Bar Dia	Unit Weight	Sr. No.	Bar Dia	Unit Weight
1	6 mm	0.22 Kg/ Rmt	8	20 mm	2.47 Kg/ Rmt
2	8mm	0.39 Kg/ Rmt	9	22 mm	2.98 Kg/ Rmt

3	10 mm	0.62 Kg/ Rmt	10	25 mm	3.85 Kg/ Rmt
4	12mm	0.89 Kg/ Rmt	11	28 mm	4.83 Kg/ Rmt
5	14 mm	1.21 Kg/ Rmt	12	32 mm	6.31 Kg/ Rmt
6	16 mm	1.58 Kg/ Rmt	13	36 mm	7.99 Kg/ Rmt
7	18 mm	2.00 Kg/ Rmt	14	40 mm	9.86 Kg/ Rmt

M-19 High Yield Strength Steel Deformed Bars:

19.1. *High yield strength steel deformed bars be either cold twisted or hot rolled shall conform to I.S. 1739-1966 and I.S. 1139- 1966 respectively.*

19.2. *Other provision and requirements shall conform to specification No. M-18 for Mild steel bars.*

M-20 High Tensile Steel Wires:

20.1. *The high tensile wires for the use in pre stressed concrete work shall confirm to I.S. 2090-1962.*

20.2. *The tensile strength of the high tensile steel bars shall be as specified in the item. In absence of the given strength, the minimum strength shall he taken as per Para 6.1 of I.S. 1785-1962. Testing shall be done as per I.S. requirements. 20.3. The high tensile steel shall be free from loose mill scale, rust oil, grease, or any other harmful matter. Cleaning of steel bars may he carried out by immersion in solvent solution, wire brushing or passing through a pressure box containing carborandum.*

20.4. *The high tensile wire shall be obtained from manufactures in coil having diameter not less than 350 times the diameter of wire itself so that wire springs back straight on being uncoiled.*

M-21 Mild Steel Binding Wires:

21.1. *The mild steel wire shall be of 1.63 mm. or 1.22 mm. (16 or 18 gauge) diameter and shall conform to I.S. 280-1972.*

21.2. *The use of black wire will be permitted for binding reinforcement bars. It shall be free from rust, oil paint, grease, loose mill scale or any other undesirable coating which may prevent adhesion of cement mortar.*

M-22 Structural Steel:

22.1 *All structural steel shall conform to I.S. 226-1965. The steel shall be free from the defects mentioned in I.S. 226-1975 and shall have a smooth finish. The material shall be free*

from loose mill scale, rust pits or other defects affecting the strength and durability. Rivet bars shall conform to I.S. 1148-1973.

22.2 *When the steel is supplied by the Contractor test certificates of the manufacturers shall be obtained according to I.S. 226-1975 and other relevant Indian Standards.*

M-23 Galvanised Iron Sheets:

23.1 *The galvanised iron sheets shall be plain or corrugated sheets of specified in item. The G.I. Sheets shall conform to I.S. 277-1977. The sheets shall be undamaged in carriage and handling either by rubbing off of zinc coating or otherwise they shall have clean and bright surface and shall be free from dents, holes, rust or white powdery deposit.*

23.2 *The length and width of G.I. sheer shall be as directed as per site condition.*

M-23 A; G.I. Valleys gutter ridges:

23. A.1 *The G.I. ridges and hips shall be of plain galvanised sheets class-3 of the thickness as specified in item. These shall be 600 mm. in width and properly bent up to shape without damage to the sheets in process of bending.*

23.A.2. *Valleys gutters and flashings shall also be galvanised sheet of thickness as specified in item. Valleys shall be 900 mm. wide overall and fishing shall be 380 mm. wide overall. They shall be bent to the, required shape without damage to the sheet in the process of bending.*

M-26 Shuttering:

26.1. *The shuttering shall be either of wooden planking of 30 mm minimum thickness with or without steel lining or of steel plates stiffened by steel angles. The shuttering shall be supported on battens and beams and props of vertical bellies properly cross braced together so as to make the centering rigid. In places of bullied props, brick pillar of adequate section built in mud mortar may be used.*

26.2. *The form work shall be sufficiently strong and shall have camber, so that it assumes correct shape after deposition of the concrete and shall be able to resist forces caused by vibration of live load of men working over it and other incidental loads associated with it. The shuttering shall have smooth and even surface and its joints shall not permit leakage of cement grout.*

26.3. *If at any stage of work during or after placing concrete in the structure, the form work sags or bulges out beyond the required shape of the structure, the concrete shall be removed and work redone with fresh concrete and adequately rigid form work. The complete form work shall be got inspected by and got approved from the Engineer-in; charge, before the reinforcement bars are placed in position.*

26.4. *The props shall consist of bullies having 100 mm. minimum diameters measured at mix length and 80 mm. at thin end and shall be placed as per design requirement. These shall rest squarely on wooden sole plates 40 mm. thick and minimum bearing area if 0-10 sq. m. lay on sufficiently hard base.*

26.5. *Double wedges shall further be provided between the sole plate and the wooden props so as to facilitate tightening and easing of shuttering without jerking the concrete.*

26.6 *The timber used in shuttering shall not be so dry as to absorb water from concrete and swell or bulge nor so green or wet as to shrink after erection. The timber shall be properly sawn and planed on the sides and surface coming in contact with concrete. Wooden form work with metal sheet lining or steel plates stiffened by steel angles shall be permitted.*

26.7 *As far as practicable, clamps shall be used to hold the forms together and use of nails and spikes avoided.*

26.8 *The surface of timber shuttering that would come in contact with concrete shall be well wetted and coated with soap solution before, the concreting is done. Alternatively coat of raw linseed oil or oil of approved manufacturer may be applied in place of soap solution. In case of steel shuttering either soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface. Under no circumstances black or burnt oil shall be permitted.*

26.9 *The shuttering for beams and slabs shall have camber of 4 mm. per metre (1 in 250) or as directed by the Engineer-in-charge so as to offset the subsequent deflection. For cantilevers, the camber at free end shall be I/50 of the projected length or as directed by the Engineer-in-charge.*

M-27 Expansion Joints-Pre-Molded Filler:

27.1 *The item provides for expansion joints in R.C.C. frame structures for internal joints, as well as exposed joints, with the use of pre molded bituminous joint filler.*

27.2 *Pre molded bituminous joint filler, i.e. performed strip of expansion joint filler shall not get deformed or broken by twisting, bending or other handling when exposed to atmospheric condition. Pieces of joint filler that have been damaged shall be rejected.*

27.3 *Thickness of the pre-molded joint filler shall be 25 mm. unless otherwise specified.*

27.4 *Pre molded bituminous joint filler shall conform to I.S. 1838-1961*

M-44 Paints:

44.1 (A) Oil paints:

44.1.1 *Oil paints shall be of the specified colour and shade, and. approved. The ready mixed paint shall only be used. However, if ready mixed paint or specified shade or tint is not*

available, white ready mixed paint with approved stainer will be allowed. In such a case, the contractor shall ensure that the shade of the paint so allowed shall be uniform.

44.1.2 All the paints shall meet with following general requirements:

(i) Paint shall not show excessive setting in a freshly opened full can and shall easily be redispressed with a paddle to a smooth homogeneous state. The paint shall show no curdling, livering, caking or colour separation and shall be free from lumps and skins.

(ii) The paint as received shall brush easily, possess good levelling properties and show no running or sagging tendencies.

(iii) The paint shall not skin within 48 hours in a three quarters filled closedcontainer.

(iv) The paint shall dry to a smooth uniform finish free from roughness, grit, unevenness and other imperfections.

44.1.3 Ready mixed paint shall be used exactly as received from the manufacturers and generally according to their instructions and without any admixtures whatsoever.

44.2 (B) Enamel Paints:

44.2.1 The enamel paint shall satisfy in general requirements as mentioned in specification of oil paints. Enamel paint shall conform to I.S. 2933 - I975.

Name of Work :-

M&R work for Premonsoon Work-2026 of various Roads Under Becharaji & Jotana Section of R & B Sub Division, Kadi, Dist. Mehsana.

Itemwise Specification

Item No. 12

Supplying and fixing jumbo bollard swiss type made out of 1.5 mm crc sheet , hight 188 cms bottom dia. 30 cm, top dia. 18 cm. with direction plate of 45 cm dia. Fabricated as per drawing pretreated with phosphering process painted with epoxy coating, reflectorised with retro reflective sheeting specified by MORT&H latest specification and fixing in size 45cm x 45 cm x 60 cm in concrete grade 1:2:4 (1 cement :2 fine sand :4 aggregate as specified by Engineer Incharge. (B) High Intensity Grade.

8.05 **Jumbo type jumbo:** Bollarad
805.01 General
The work covers supplying and fixing road way indicators, hazard makers and object markers, Bollards.
805.2 The design materials to be used and the location of the road delineators shall conform to recommended practice for road delineators, IRC : 79 and relevant drawing or as otherwise directed by the Engineer.
805.3 Measurement for payment.
The measurement shall be made in numbers of Bollards fixed at site.
805.4 Rate the contract unit rate for road Bollard shall be payment in full compensation for furnishing all labor, materials, tools, equipment for preparing, supplying and fixing at site and all other incidental costs necessary to complete the work to these specifications.
Measurements for Payment:
The payment shall be made unit of a No. basis.

Item No. 14:

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

1. Description

The work shall consist of scarifying the existing road surface to required depth, preparing pre cast kerb with kerb laying machine of required shape and size and fixing them in place in traffic island at Junction or as directed; as per drawing and joining them in C.M.1:3 and filling the central island portion with selected soil and compacting it and painting the sides as directed.

2. Material:

2.1 : M-25 Pre Cast Kerb: (1) Water shall confirm to M-1 (2) Cement shall conform to M-3 (3) Sand shall conform to M-6 (4) Mortar shall conform to M-11 (5) Aggregates shall conform to M-12 (6) Shuttering shall conform to M-26.

Pre cast C.C. Block: M200 Pre Cast block shall be sharp, smooth and in true line, level and shape as per drawing or as directed. Expansion joint shall be provided at every 10 mt. length

3. Construction:

The road surface shall be excavated to required depth on approved alignment. For the base of stone C.C. 1:5:10 base concrete shall be provided conforming to Standard Specification The vertical C.C. stones shall be fixed as shown in drawing to line and level and expansion joint shall be provided. The outer sides of the vertical kerb stones shall be applied a coat of primer and subsequently white washed with two coats

.0 Mode of Measurement and Payment: The measurement shall be on running metre basis and shall include all the work including necessary excavation, C.C. Blocks and soil filling and joining C.C. Blocks in C.M.1:3, curing, white washing , with all labour, material tools & plants etc complete.

Item No.15

Providing oil paint colour to Center verge (Kerb) by Yellow and Black patta (Three Coat) one coat of priming & two coat of oil Paint including cost of material required for paint and all labour work etc complete as per direction.

1.0. Materials

(B) Enamel paints:

44.2.1. *The enamel paint shall satisfy in general requirements in specification of oil paints, Enamel paint shall conform to I.S. 2933-1975.*

2.0. Workmanship

2.1. *General : The materials required for work of painting work shall be obtained directly from approved manufactures or approved dealer and brought to the site in maker's drums; kegs. etc. with seal unbroken.*

2.1.2. *All materials not in actual use shall be kept properly protected, lids of containers shall be kept closed and surface of paint in open or partially open containers covered with a thin layer of turpentine to prevent formation of skin. The materials which have become state or flat due to improper and long storage shall not be used. The paint shall be stirred thoroughly in its container before pouring into small containers. While applying also, the paint shall be continuously stirred in smaller container. No left over paint shall be put back into stock tins. When not in use the containers shall be kept properly closed.*

2.1.3. *If for any reasons, things is necessary, the brand of thinner recommended by the manufacturer shall be used.*

2.1.4. *The surface to be painted shall be thoroughly cleaned and dusted. All rust, dirt and grease shall be thoroughly removed before painting is started. No painting on exterior or other exposed part o the work shall be carried out in wet, damp or otherwise unfavorable weather and all the surfaces shall be thoroughly dry before painting work is started.*

2.2. Application of paint:

2.2.1. *Brushing operations are to be adjusted to the spreading capacity advised by the manufacture of particular paint. The paint shall be applied evenly and smoothly by means of crossing and laying off. The crossing and laying off consists of covering the area over with paint, brushing the surface hard for the first time over and then brushing alternately in opposite directions two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after the -laying off is finished. The full process of crossing and laying off will constitute one coat.*

2.2.2. *Each coat shall be allowed to dry completely and lightly rubbed with very fine grade of sand-paper and loose particles brushed off before next coat is applied. Each coat shall vary slightly in shade and shall be got approved from Engineer-in-charge before next coat is started.*

2.2.3. *Each coat the last shall be lightly rubbed down with sand paper of fine pumice stone and cleaned of dust before the next coat is applied. No hair marks from the brush of clogging of paint puddles in the corners of panels, angles of moldings etc. shall be left on the work.*

2.2.4. *Special care shall be taken while painting over bolts, nuts, rivets, overlaps etc. Approved best quality brushes shall be used.*

Applying priming coat over new steel and other metal surfaces

1.0. Materials

1.1. *The ready mixed primer, brushing red shall conform to I.S. 102-1962.*

1.2. *The thinner (linseed oil) shall conform to I.S. 75-1973. If for any reason, thinning is necessary m case of ready mix paint the brand of thinner recommended by manufacture shall be used.*

2.0. Workmanship

2.1. Preparation of surfaces *: The surfaces painting shall be cleaned of all rust, scale, dirt and other foreign matter sticking to it with wire brushes, steel wool, scrapers, sand paper etc. This surface shall then be wiped finally*

with mineral turpentine which shall also remove grease and perspiration of hand marks. The surface shall then be allowed to dry.

2.2. Application of primer :

2.2.1. *After the preparation of the surface, the priming coat shall be applied immediately. The brushing operations are to be adjusted to the spreading capacity advised by the manufacturer of the particular primer. The paint shall be applied evenly and smoothly by means of crossing and laying off. The crossing and laying off consists of covering the area over with paint, brushing alternately in opposite directions, two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing and laying off wall constitute one coat.*

2.2.2. *During painting, every time, after the priming coat has been worked out of the brush bristles or after the brush has been unloaded, the bristles of the brush shall be opened up by striking the brush against portion of the unpainted surface with the end of the bristles, held at right angles to the surface, so that bristles thereafter will collect the correct amount of paint when dipped again in to a paint container The prima/y coat shall be allowed to dry completely before painting is started.*

2.2.3. *No hair marks from the brush or clogging at pain puddles in the corner of panels angles of molding etc. shall be left on the work*

2.2.4. *Special care shall be taken while painting over bolts, nuts, rivets, overlaps etc.*

2.2.5. *The container when not in use shall be kept close and free from air so that paint does not thickness and also shall be kept guarded from dust.*

3.0. Mode of measurements & payment

3.1. *The new steel and other metal surface shall be measured under this item.*

3.2. *All the work shall be measured net in the decimal system, as executed subject to the following limits unless otherwise stated hereinafter.*

(a) Dimensions shall be measured to the nearest 0.01 meter.
(b) Areas shall be worked out to the nearest 0.01 sq. meter.

3.3. *No deductions shall be made for openings not exceeding 0.5 sq. mt. each and no addition shall be made for painting to beddings, moldings, edges, jambs, soffits, sills etc. of such opening.*

3.4. *In case of fabricated structural steel and iron work, priming coat of paint shall be included with frabation. In case of trusses if measured in sq. m. compound girders, stanchions, lattices, grader and similar work, actual area shall be measured in sq. m. and no extra shall be paid for painting on bolts heads, nuts, washers etc. No addition shall be made to 1 he weight calculated for the purpose of measurements of steel and iron works for paint applied on shop or at site.*

3.5. *The different surfaces shall be grouped into one general item, areas of uneven surfaces being converted into equivalent plain areas in accordance with the table given as per Annexure-ll for payment.*

3.6. The rate shall be for a unit of One sq, meter.

Item No.17

Providing and laying asphalt painting on BT surface with bitumen grade VG-30 at the rate of 5 Kg /10 Sqm. By mechanical sprayer and spreading the stone dust on prepared surface at the rate of 0.03 Cum. / 10 Sqm. etc. complete and rolling with roller and brushing etc. complete.

Materials & Application Rates

- ***Bitumen Grade****: VG-30 (Viscosity Grade 30)*

- Suitable for **hot climates** and **heavy traffic roads**
- Offers good **adhesion, durability,** and **temperature resistance**

- **Bitumen Application Rate**: 5 kg per 10 sqm
  - Applied using a **mechanical sprayer** for uniform distribution

Stone Dust Application Rate: 0.03 cubic meters per 10 sqm

- Spread immediately after bitumen spraying to prevent tackiness

VG-30 Bitumen Technical Properties

Property	Specification	Test Method
Absolute Viscosity @ 60°C	2400–3600 Poise	IS 1206 (Part 2)
Kinematic Viscosity @ 135°C	≥ 350 cSt	IS 1206 (Part 3)
Penetration @ 25°C	50–70 (0.1 mm)	IS 1203
Softening Point (R&B)	≥ 47°C	IS 1205
Ductility @ 25°C	≥ 40 cm	IS 1208
Flash Point	≥ 220°C	IS 1209
Solubility in Trichloroethylene	≥ 99.0%	IS 1216

Execution Process

1. **Surface Preparation**
   - Clean and dry the BT surface
   - Remove loose particles and dust
2. **Bitumen Spraying**
   - Use a calibrated mechanical sprayer
   - Ensure even coverage at 5 kg/10 sqm
3. **Stone Dust Spreading**
   - Immediately spread stone dust at 0.03 cum/10 sqm
   - Prevents sticking and improves surface texture
4. **Rolling & Brushing**

- Compact using a road roller (8–10 ton)
- Final brushing to remove excess dust and ensure finish

Safety & Handling

- Use **PPE** during application
- Ensure **adequate ventilation** when working with hot bitumen
- Avoid skin contact and inhalation of fumes.

Mode of Payment: Per One Sqm. Basis.

Dy. Executive Engineer
R & B Sub Division
Kadi

Name Of Work :-
M&R work for Premonsoon Work-2026 of various Roads Under Kadi Section 2 of R & B Sub Division, Kadi, Dist. Mehsana.

TEST SCHEDULE

Item No.	Brief Description of Materials to be tested	Prescription of Test which shall be carried out	Frequency @ which test shall be carried out		Qty of Materials	Total No. of Test to be taken
1	45 to 63 mm size M.C. Metal	(1) Water Absorption	One test per 3000 Cu.M		140.00 Cum	1
		(2) Impact Value	1 to 100 Cu.M. 100 to 500 Cu.M. 500 to 1500 Cu.M. 1500 to 5000 Cu.M.	1 3 5 7		3
		(3) Flakiness Index and elongation index	As above			3
		(4) Gradation	One Test per 100 Cu.M			3
1A	Stone Screening 13.2mm Size	(1) Water Absorption	As above		17.00 Cum	1
		(2) Impact Value	As above			1
		(3) Flakiness Index and elongation index	As above			1
		(4) Gradation	As above			1
1B	Stone Dust	(1) Water Absorption	As above		12.00 Cum	1
		(2) Impact Value	As above			1
		(3) Flakiness Index and elongation index	As above			1
		(4) Gradation	As above			1
2	WMM 45-22.4mm(Metal)	(1) Water Absorption	As above		129.00 Cum	3
		(2) Impact Value	As above			3
		(3) Flakiness Index and elongation index	As above			3
		(4) Gradation	As above			3
2A	WMM 22.4-2.36mm(Kapchi)	(1) Water Absorption	As above		172.00 Cum	3
		(2) Impact Value	As above			3
		(3) Flakiness Index and elongation index	As above			3
		(4) Gradation	As above			3
2B	WMM Stonedust	(1) Water Absorption	As above		129.00 Cum	3
		(2) Impact Value	As above			3
		(3) Flakiness Index and elongation index	As above			3
		(4) Gradation	As above			3
3	Kapchi	(1) Water Absorption	As above		445.00 Cum	3
		(2) Impact Value	As above			3

		(3) Flakiness Index and elongation index	As above			3
		(4) Gradation	As above			3
4	Grit	(1) Water Absorption	As above		445.00 Cum	3
		(2) Impact Value	As above			3
		(3) Flakiness Index and elongation index	As above			3
		(4) Gradation	As above			3
5	Sand	(1)Fineness Modules (2)Efflorence (3)Size	1 Test per 200 Cum.		102.00 Cum	1
		(5) Gradation				
		(6) Silt Content				
6	Cement	(1) Consistency	Upto 50 MT - 1 Test		3.40 MT	1
		(2) Setting time	50 to 100 MT - 2 Test			
		(3) Fineness	100 to 200 MT - 3 Test			
		(4) Chemical analysis	200to 300 MT - 4 Test			
		(5) Soundness	300 to 500 MT - 5 Test			
			500 to 800 MT-6 Test			
			800 to 1300 MT -7 Test			
			More than 1300 MT 8 Test			
7	Asphalt	(1)Penetration test as per I.S.1203, (2)Ductility test, (3)Specification Gravity test, (4)Softening point test, (5)Viscocity test	For 1 to 10 Tenker For 11 to 20 Tenker For 21 to 50 Tenker For 51 to 100 Tenker Remaining every 50 tanker Additional	1 2 3 4 1	2 Tanker	1
8	Water	Chemical Analysis	1 Test for each source			1
9	GSB-V	(1) Water Absorption	One test per 3000 Cu.M		175.00 Cum	1
		(2) Impact Value	1 to 100 Cu.M. 100 to 500 Cu.M. 500 to 1500 Cu.M. 1500 to 5000 Cu.M.	1 3 5 7		3
		(3) Flakiness Index and elongation index	As above			3
		(4) Gradation	One Test per 100 Cu.M			3

Deputy Executive Engineer
R & B Sub Division
Kadi

Executive Engineer
R. & B. Division
Mehsana