

# FINAL REPORT

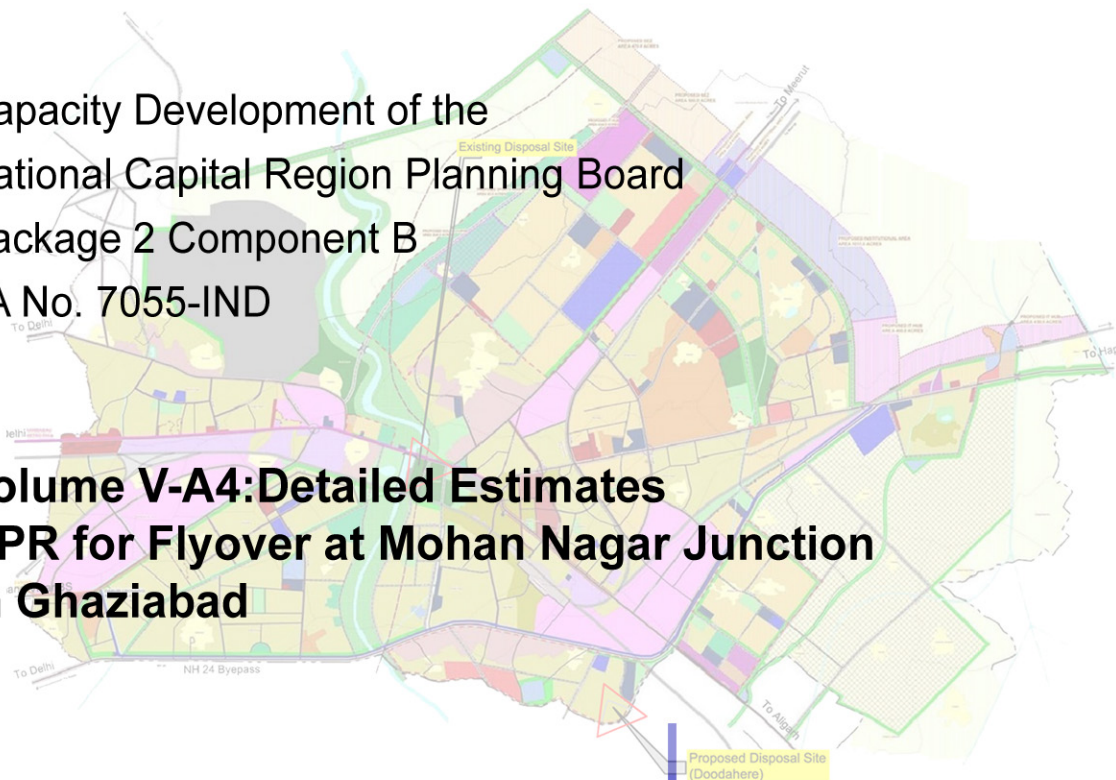
ADB



Asian Development Bank  
National Capital Region Planning Board

Capacity Development of the  
National Capital Region Planning Board  
Package 2 Component B  
TA No. 7055-IND

**Volume V-A4: Detailed Estimates  
DPR for Flyover at Mohan Nagar Junction  
in Ghaziabad**



**WilburSmith**  
ASSOCIATES

July 2010

NCR Planning Board  
Asian Development Bank

# Capacity Development of the National Capital Region Planning Board (NCRPB) – Component B (TA No. 7055-IND)

FINAL REPORT

Volume V-A4: DPR for Flyover at Mohan Nagar Junction in  
Ghaziabad

Detailed Estimates

July 2010

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## **Appendix E-1: Summary Cost Estimate**

### SUMMARY OF COST

BILL NO.	BILL NAME	AMOUNT (Rs.)
1	SITE CLEARANCE AND DISMANTLING	168,394.00
2	EARTH WORK	4,768,367.00
3	SUB-BASE AND BASE COURSES	30,497,551.00
4	BITUMINOUS WORKS	27,862,232.00
5	FLYOVER	422,521,116.00
6	TRAFFIC SIGNAGES, ROAD MARKING AND OTHER APPURTENANCES	950,674.00
7	DRAINAGE AND PROTECTIVE WORKS, DUCTS & OTHER SERVICES	22,552,630.00
8	ELECTRICAL WORKS	4,165,144.00
	<b>TOTAL CONSTRUCTION COST</b>	<b>513,486,108.00</b>
	CONTIGENCIES & PETTY SUPERVISION CHARGES	15,404,583.00
	3%	
	UTILITY SHIFTING	10,269,722.00
	2%	
	<b>GRAND TOTAL</b>	<b>539,160,413.00</b>

## **Appendix E-2: Detailed Item-wise Cost Estimates**

**1. SITE CLEARANCE AND DISMANTLING**

Item No.	Description	Ref. to MoRTH Spec.	Unit	Quantity	Rate MoRTH	Amount MoRTH
1.01	Clearing and grubbing road land in an area of light jungle by mechanical means including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned, up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness as per Technical specifications and as directed by the Engineer-in-charge.	201	ha	3.51	48,044.00	168,394.22
	<b>Total</b>					<b>168,394.22</b>

**2. EARTH WORK**

<b>Item No.</b>	<b>Description</b>	<b>Ref. to MoRTH Spec.</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate MoRTH</b>	<b>Amount MoRTH</b>
2.01	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 within all lifts and lead upto 1000m	301	cum	15,417.75	46.00	709,216.50
2.02	Supplying and filling in with good earth for construction of subgrade and earthen shoulder in regular layers of 150mm thick etc including watering, consolidation by power road roller etc complete.	305	cum	17,845.00	221.00	3,943,745.00
2.03	Supplying and filling in with good earth for formation of traffic island, median strips, footpaths etc., including watering and consolidation by hand roller etc., complete.	407	cum	735.00	83.00	61,005.00
2.04	Grassing with 'Doobs' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed	307	Sqm	10,880.00	5.00	54,400.00
	<b>Total</b>					<b>4,768,366.50</b>



**3. GRANULAR BASE COURSE AND SUB-BASE**

<b>Item No.</b>	<b>Description</b>	<b>Ref. to MoRTH</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate MoRTH</b>	<b>Amount MoRTH</b>
3.01	Construction of granular sub-base by providing close graded material (Grading I), mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, all complete as per Technical specifications and as directed by the Engineer-in-charge.	401	cum	6,404.00	2,219.00	14,210,476.00
3.02	Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.	406	cum	7,087.50	2,298.00	16,287,075.00
	<b>Total</b>					<b>30,497,551.00</b>

**4. BITUMINOUS COURSE**

<b>Item No.</b>	<b>Description</b>	<b>Ref. to MoRTH Spec.</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate MoRTH</b>	<b>Amount MoRTH</b>
4.01	Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.60 kg/sqm using mechanical means.	502	sqm	28,350.00	28.00	793,800.00
4.02	Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.6 kg per sqm on concrete surface treated with primer cleaned with mechanical broom all complete as per Technical specifications and as directed by the Engineer-in-charge.	503	sqm	28,350.00	12.00	340,200.00
4.03	Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.25 kg per sqm on the prepared nominal bituminous surface cleaned with mechanical broom all complete as per Technical specifications and as directed by the Engineer-in-charge.	503	sqm	28,350.00	10.00	283,500.00
4.04	Providing and laying dense graded bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5 per cent by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.	507	cum	2,190.75	7,650.00	16,759,237.50
4.05	Providing and laying bituminous concrete Grading II with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 per cent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects.	509	cum	1,134.00	8,541.00	9,685,494.00
	<b>Total</b>					<b>27,862,231.50</b>

## 5. FLYOVER

Item No.	Description	Ref. to MoRTH Spec.	Unit	Quantity	Rate MoRTH	Amount MoRTH
5.1.01	Earth work in excavation ( ordinary soil ) for foundation of Bridges as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material all complete as per Technical specifications and as directed by the Engineer-in-charge.	304	cum	3,276.43	49.00	160,545.07
5.1.02	Providing Plain Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.					
5.1.02a	PCC Grade M15 for Pile cap	1500, 1700 & 2100	cum	128.25	4,773.00	612,132.48
5.1.02b	PCC Grade M15 for levelling course	1500, 1700 & 2100	cum	971.20	4,966.00	4,822,979.20
5.1.02c	Providing Plain Cement Concrete M20 in Open Foundation complete as per Drawing and Technical Specifications.	1500, 1700 & 2100	cum	59.54	5,749.00	342,266.72
5.1.03	Bored cast-in-situ M40 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and Technical Specifications and removal of excavated earth with all lifts and lead upto 1000 m.	1100,1600 & 1700	m	2,996.40	10,811.00	32,394,080.40
5.1.04	Providing Steel Liner for Pile including Fabricating and Setting out as per Detailed Drawing.	1100	MT	210.94	58,457.00	12,331,190.02
5.1.05	Pile Load Test on single Vertical Pile in accordance with IS:2911(Part-IV)	1100				
5.1.05a	a) Initial		No	2.00	31,941.20	63,882.40
5.1.05b	b) Routine load test		No	3.00	20,907.00	62,721.00
5.1.05c	c) Lateral load test		No	3.00	20,907.00	62,721.00
5.1.06	Cement Concrete for Reinforced Concrete in Pile Cap complete as per Drawing and Technical Specification	1100, 1500 & 1700				
5.1.06a	RCC Grade M40 for Pile Cap		cum	2,203.36	5,913.00	13,028,479.51
5.1.07	Providing Reinforced cement concrete in sub-structure complete as per drawing and Technical Specifications	1500, 1700 & 2200				
5.1.07a	RCC Grade M50		cum	931.84	7,095.00	6,611,420.46

**5. FLYOVER**

<b>Item No.</b>	<b>Description</b>	<b>Ref. to MoRTH Spec.</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate MoRTH</b>	<b>Amount MoRTH</b>
5.1.07b	RCC Grade M25	1500, 1700 & 2200	cum	106.64	6,406.00	683,142.57
5.1.08	Furnishing and Placing Reinforced/ Prestressed cement concrete in super-structure as per drawing and Technical Specification	1500 & 1600 1700	cum			
5.1.08a	PSC Beam and Slab M50		cum	9,370.02	8,711.00	81,622,265.13
5.1.09	Supplying, fitting and placing HYSD bar reinforcement complete including providing couplings wherever required as per drawings and Technical specifications and as directed by the Engineer-in-charge.	1600				
5.1.09a	For Foundation		MT	666.93	53,679.00	35,800,303.80
5.1.09b	For Substructure		MT	260.86	53,754.00	14,022,378.64
5.1.09c	For Superstructure		MT	1,158.81	54,403.00	63,042,512.37
5.1.10	High Tensile Strands		MT	405.86	88,473.00	35,907,547.03
5.1.11	Providing and laying Plain cement concrete M-15 for levelling course of approach slab, mechanically mixed and compacted complete as per drawings and Technical specifications and as directed by the Engineer-in-charge.	1500 , 1700 & 2100	cum	17.85	4,775.00	85,233.75
5.1.12	Providing and laying Reinforced cement concrete of M30 grade for approach slab including reinforcement and formwork all complete as per drawings and Technical specifications and as directed by the Engineer-in-charge.	1500,1600, 1700 & 2704	cum	35.70	8,683.00	309,983.10

### 5. FLYOVER

Item No.	Description	Ref. to MoRTH Spec.	Unit	Quantity	Rate MoRTH	Amount MoRTH
5.1.13	Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-40 grade concrete with HYSD reinforcement conforming to IRC:21 and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MOST circular No. RW/NH - 33022/1/94-DO III dated 24 June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, complete as per drawing and Technical specifications and as directed by the Engineer-in-charge.					
5.1.13a	Crash Barrier (having cross section area 0.26 sqm)	809	m	2,414.00	3,746.00	9,042,844.00
5.1.14	RCC M40 Concrete for Median	809	cum	192.00	7,104.00	1,363,968.00
5.1.15a	Expansion joint including crack inducer slot in surfacing filled with rubber/bitumen seal	2605	m	102.00	16,000.00	1,632,000.00
5.1.15b	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 authorised representative ensuring compliance to the manufacturer's instructions for installation.	2607	m	102.00	29,000.00	2,958,000.00
5.1.16	Supplying, fitting and fixing in position true to line and level POT-PTFE bearing consisting of a metal piston supported by a disc or unreinforced elastomer confined within a metal cylinder, sealing rings, dust seals, PTFE surface sliding against stainless steel mating surface, complete assembly to be of cast steel/fabricated structural steel, metal and elastomer elements to be as per IRC: 83 part-I & II respectively and other parts conforming to BS: 5400, section 9.1 & 9.2 and clause 2006 of MoRTH Specifications complete as per drawing and approved Technical Specifications.	2000 & 2200	tonne capacity	33,600.00	207.00	6,955,200.00
5.1.17	Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.6 kg per sqm on cement concrete surface cleaned with mechanical broom complete as per Technical specifications and as directed by the Engineer-in-charge.	503	sqm	9,705.00	15.00	145,575.00

**5. FLYOVER**

<b>Item No.</b>	<b>Description</b>	<b>Ref. to MoRTH Spec.</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate MoRTH</b>	<b>Amount MoRTH</b>
5.1.18	Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.25 kg per sqm on the prepared bituminous surface cleaned with mechanical broom complete as per Technical specifications and as directed by the Engineer-in-charge.	503	sqm	9,705.00	10.00	97,050.00
5.1.19	Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 per cent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects	509	sqm	9,705.00	8,541.00	82,890,405.00
5.1.20	Providing and laying 25 mm thick mastic asphalt wearing course with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated finegrained hard stone chipping of 13.2 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces is not less than 1000C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.	515	sqm	9,705.00	459.00	4,454,595.00
5.1.21	Construction of Reinforced Earth Structures including assembly and erection of reinforcing elements, placement of facing panels, plain cement concrete M15 as levelling course for the facia material and all associated components, etc., all complete as per drawings and Technical specifications and as directed by the Engineer-in-charge.	3100	sqm	3,419.66	2,000.00	6,839,328.00
5.1.22	Filling with approved material suitable for Earth Retaining Structure graded and compacted to meet requirement as per Technical specifications and as directed by the Engineer-in-charge.	305	cum	1,628.57	221.00	359,914.41
5.1.23	Providing and fitting Drainage Spouts complete as per drawing and Technical specifications and as directed by the Engineer-in-charge.	2705	Each	256.00	1,060.00	271,360.00

**5. FLYOVER**

<b>Item No.</b>	<b>Description</b>	<b>Ref. to MoRTH Spec.</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate MoRTH</b>	<b>Amount MoRTH</b>
5.1.24	Providing and fixing 150mm dia PVC pipes for draining storm water to drain all complete as per drawings and technical specifications and as directed by the Engineer-in-charge.		Rm	1,505.25	300.00	451,575.90
5.1.25	Printing of Bridge No. and span arrangement of any shade with synthetic enamel paint black or any other approved colour to give an even shade complete as per Technical specifications and as directed by the Engineer-in-charge.	801	per cm height per letter	100.00	0.30	30.00
5.1.26	Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces	803	sqm	56,245.21	55.00	3,093,486.47
	<b>Total</b>					<b>422,521,116.00</b>

**6. TRAFFIC SIGNAGES, ROAD MARKING AND OTHER APPURTENANCES**

Item No.	Description	Ref. to MoRTH Spec.	Unit	Quantity	Market Rate	Amount MoRTH
6.01	Providing and fixing of retro- reflectorised cautionary, mandatory and informatory sign as per IRC :67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing all complete as per Technical specifications and as directed by the Engineer-in-charge.	801				
6.01a	90 cm equilateral triangle		No	7.00	3,267.00	22,869.00
6.01b	90 cm high octagon		No	4.00	4,838.00	19,352.00
6.01c	75 cm x 60 cm rectangular ( Chevron Signs )		No	2.00	3,091.00	6,182.00
6.01d	80 cm x 60 cm rectangular ( Bus stop signs )		No	7.00	3,902.00	27,314.00
6.02	Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes all complete as per Technical specifications and as directed by the Engineer-in-charge.	803				
6.02a	Lane, Centreline, Edge and other marking along strips		sq.m.	761.70	271.00	206,420.70
6.02b	Directional arrows and letters		sq.m.	-	271.00	-
6.03	Providing Gantry sign board over a designed support system of aluminium alloy or galvanised steel		No	2.00	150,000.00	300,000.00
6.04	Providing and erecting direction and place identification retro-reflectorised sign as per IRC:67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting of 2 mm thick supported on a mild steel single angle iron post 75 x 75 x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 x 45 x 60 cm, 60 cm below ground level as per approved drawing and all complete as per Technical specifications and as directed by the Engineer-in-charge.	801				
6.04a	Direction and Place Identification Signs with size more than 0.9 sqm size Board.		sq.m.	6.30	6,930.00	43,659.00
6.04b	Direction and Place Identification Signs upto 0.9 sqm Size Board.		sq.m.	0.96	6,608.00	6,343.68



**6. TRAFFIC SIGNAGES, ROAD MARKING AND OTHER APPURTENANCES**

<b>Item No.</b>	<b>Description</b>	<b>Ref. to MoRTH Spec.</b>	<b>Unit</b>	<b>Quantity</b>	<b>Market Rate</b>	<b>Amount MoRTH</b>
6.05	Providing and fixing of road stud 100x 100 mm, die-cast in aluminium, resistant to corrosive effect of salt and grit, fitted with lense reflectors, installed in concrete or asphaltic surface by drilling hole 30 mm upto a depth of 60 mm and bedded in a suitable bituminous grout or epoxy mortar, all as per BS 873 part 4:1973		No	967.00	230.00	222,410.00
6.06	Reinforced cement concrete M15 grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and printing etc all complete as per Technical specifications and as directed by the Engineer-in-charge.	804				
6.06a	Ordinary kilometer stone (precast)		No	3.00	1,846.00	5,538.00
6.06b	Hectometer stone (precast)		No	16.00	496.00	7,936.00
6.07	Reinforced cement concrete M15 grade boundary pillars of standard design as per IRC:25-1967, fixed in position including finishing and lettering but excluding painting all complete as per Technical specifications and as directed by the Engineer-in-charge.	806	No	145.00	570.00	82,650.00
	<b>Total</b>					<b>950,674.00</b>

**7. DRAINAGE WORKS**

Item No.	Description	Ref. to MoRTH	Unit	Quantity	Rate MoRTH	Amount MoRTH
7.01	Earth work in excavation for foundation of Drains in ordinary rock (not requiring blasting) as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material all complete as per Technical specifications and as directed by the Engineer-in-charge.	304	cum	8,100.00	49.00	396,900.00
7.02	Providing Plain Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.	1500, 1700 & 2100				
7.02a	PCC Grade M15		cum	648.00	4,966.00	3,217,968.00
7.03	Providing Reinforced Cement Concrete M25 in Open Foundation complete as per Drawing and Technical Specifications.	1500, 1700 & 2100	cum	1,684.80	5,695.00	9,594,936.00
7.04	Supplying, fitting and placing HYSD bar reinforcement complete as per drawing and all complete as per Technical specifications and as directed by the Engineer-in-charge.	1600	MT	132.52	53,679.00	7,113,326.36
7.05	Construction of cement concrete kerb with channel with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M10 grade foundation 150 mm thick, kerb channel 300 mm wide, 50 mm thick in PCCM20 grade, sloped towards the kerb, kerb stone with channel laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408	408	Rm	3,920.00	544.00	2,132,480.00
7.06	Painting two coats on kerbs in black and white or yellow after filling the surface with synthetic enamel paint complete as per drawing and Technical specifications and as directed by the Engineer-in-charge.	800	sqm	1,764.00	55.00	97,020.00
	<b>Total</b>					<b>22,552,630.00</b>

**8. ELECTRICAL WORKS**

SI No.	Description	Ref. to MoRTH Spec.	Unit	Qty	Rate	Amount
8.01	Supplying,High pressure sodium vapour street lighting fitting die cast aluminium canopy with aluminium housing for control gear, finished stove enamel gray glassy white canopy interior with pair of anodised aluminium reflectors clear acrylic bowl, gasket lining for drip inset resistance,duly wired with porcelain holder, heavy duty copper wound ballast, igniter and HPF condenser including a mercury vapour lamp					
8.01a	250W high pressure Sodium Vapour Lamp of philips /Bajaj or Equivalent make of material as per IS standards.		Nos	176	5,000.00	880,000.00
8.02	Supply and erection of Steel tubular poles with one side arm/ both side arm bracket of specified length including accessories and incidentals as given below a) Sole Plate at bottom. b) Earthing arrangement as per IS Rule with 20mm dia x2m long G.I. earthing rod and 8SWG G.I Wire of 2 in a set. c) Junction box with terminal block and fuse Protection for Luminaries circuit with gasket. Railway Type locking , 440 V Statutory Notice Board. d) 2x 1C x2.5 sq.mm. PVC insulated copper wire +1No. 1sq.mm. PVC insulated Cu wire from junction box to luminaries. e) Muffing of 300 mm above ground including 3mm thick heat cement finish (6:3:1). f) Providing Suitable class 'B' G.I.pipe with long bend for passage of cable up to cable looping box. g) identification working in Block letters or Digits (40 mm size) one alphabet and 3 nos . in Black Japan Paint withing circle. h) The cost to include for 10mm M.S.Base plate and 4 no.holding down J bolts:transportation cost of carriage of pole anywhere in the project area ,rate to include for multiple handling. j) All steel parts to be painted with an approved coat of anti-corrosive primer and 2 coats of aluminium					
8.02a	9 mtr. Pole (Double arm pole)		Nos	88	30,000.00	2,640,000.00
8.03	Design, Installation, Testing and commissioning of outdoor hooded type Feeder cum Service Pillar Box made of 5mm thick M.S.Plate with 15mm thick cast iron base for Programmable Time Switch complete with suitable Contactor, Fuse protection isolating switch 1 x 4P x 63A x MCB Time Switch: TSQ - 100 of L & T Contractor: ML-2 of L & T 4 x4P x 25A MCB		Nos	2	11,500.00	23,000.00

**8. ELECTRICAL WORKS**

<b>SI No.</b>	<b>Description</b>	<b>Ref. to MoRTH Spec.</b>	<b>Unit</b>	<b>Qty</b>	<b>Rate</b>	<b>Amount</b>
8.04	Supply and Laying of service line for street lighting PVC armoured Aluminium Cables - 3.5C x 25 sq.mm. on wall including supply and fixing of M.S. saddles with earthing attachment. (The rate shall be inclusive of excavation, back filling and ramming of soil consolidating & making good.)		Rm	140	185.00	25,900.00
8.05	Supply and laying PVC armoured Aluminium Conductor cable underground in trenches, including earthwork excavation, brick protection on the top of the cable (6 nos.Bricks/mtr.) including filling the space between brick and the cable and also trench with shifted soil,levelling and restoring the surface duly rammed / Cable trench with necessary saddle on cable rack.					
8.05a	4C x 16 sq.mm		Rm	2860	145.00	414,700.00
8.06	Supplying and fitting Vitrified Enamel Danger Board at a height of 3mtr. above G.L. with clamps made of 25mm x 3mm G.I. Strip.		Nos	88	463.00	40,744.00
8.07	Provide materials and construct foundations in M15 concrete 1000mm x1000mmx 1.5m, 300mm height located above ground level for street light pole including fixing in position of Anchor Bolts etc.,all asper Drawings and specifications.(For Double armed poles)		Nos	88	1,600.00	140,800.00
	<b>Total</b>					<b>4,165,144.00</b>

## **Appendix E-3: Detailed Quantity Estimates**

## ESTIMATE

Item No	Description	Dimensions				Unit	Total Quantity
		Nos	Length	Breadth	Depth		
<b>1</b>	<b>Bill No:- 1 SITE CLEARANCE AND DISMANTLING</b>						
1.01	<b>Clearing and Grubbing</b>					Ha	<b>3.51</b>
	Ch:0+260 - 0+420	1	160.00	26.50			0.42
	Ch:0+420 - 0+460	1	40.00	36.00			0.14
	Ch:0+460 - 1+650	2	1,190.00	9.50			2.26
	Ch:1+650 - 1+720	1	70.00	36.00			0.25
	Ch:1+720 - 1+880	1	160.00	26.50			0.42
	<b>Total</b>						<b>3.51</b>
<b>2</b>	<b>Bill No:- 2 EARTH WORK</b>						
2.01	<b>Earth work Excavation</b>						<b>15,417.75</b>
	LHS Service Road						6,892.95
	RHS Service Road						8,524.80
	<b>Total</b>						<b>15,417.75</b>
2.02	<b>Sub-grade and Earthern Shoulders</b>					cum	<b>17,845.00</b>
	<b>Subgrade</b>						
	<b>Main Road</b>						
	Ch:0+260 - 0+420	1	160.00	17.00	0.50		1,360.00
	Ch:0+420 - 0+460	1	40.00	17.00	0.50		340.00
	Ch:1+650 - 1+720	1	70.00	17.00	0.50		595.00
	Ch:1+720 - 1+880	1	160.00	17.00	0.50		1,360.00
	<b>Service Road</b>						
	Ch:0+260 - 0+420 ( Tapering )	2	160.00	5.75	0.50		920.00
	Ch:0+420 - 0+460	2	40.00	9.50	0.50		380.00
	Ch:0+460 - 1+650	2	1,190.00	9.50	0.50		11,305.00
	Ch:1+650 - 1+720	2	70.00	9.50	0.50		665.00
	Ch:1+720 - 1+880 ( Tapering )	2	160.00	5.75	0.50		920.00
	<b>Shoulder</b>						-
	<b>Total</b>						<b>17,845.00</b>
2.03	<b>Soil filling- Median and Island</b>					cum	<b>735.00</b>
	<b>Median</b>						
	Ch:0+260 - 0+811	1	551.00	1.00	0.75		413.25
	Ch:1+451 - 1+880	1	429.00	1.00	0.75		321.75
	<b>Total</b>						<b>735.00</b>
2.04	<b>Grassing with ' Doobs' Grass</b>						<b>10,880.00</b>
	Ch:0+811 - 1+451	1	640.00	17.00			10,880.00
	<b>Total</b>						<b>10,880.00</b>







## ESTIMATE

Item No	Description	Dimensions					Unit	Total Quantity
		Nos	Length	Breadth	Depth	Area		
4.05	<b>Bituminous concrete</b>						cum	<b>1,134.00</b>
	<b>Grading-II</b>							
	<b>Main Road</b>							-
	Ch:0+260 - 0+420	1	160.00	15.00	0.04			96.00
	Ch:0+420 - 0+460	1	40.00	15.00	0.04			24.00
	Ch:1+650 - 1+720	1	70.00	15.00	0.04			42.00
	Ch:1+720 - 1+880	1	160.00	15.00	0.04			96.00
	<b>Service Road</b>							
	Ch:0+260 - 0+420 ( Tapering )	2	160.00	3.75	0.04			48.00
	Ch:0+420 - 0+460	2	40.00	7.50	0.04			24.00
	Ch:0+460 - 1+650	2	1,190.00	7.50	0.04			714.00
	Ch:1+650 - 1+720	2	70.00	7.50	0.04			42.00
	Ch:1+720 - 1+880 ( Tapering )	2	160.00	3.75	0.04			48.00
	<b>Total</b>							<b>1,134.00</b>
<b>6</b>	<b>Bill No:-6 Traffic Signages, Road Marking and other Appurtenances</b>							
6.01	<b>Cautionary,Mandatory and Informatory sign</b>							
6.01a	<b>90 cm equilateral triangle</b>					No.		<b>7.00</b>
	Triangular Regulatory Signs	5						5.00
	Cautionary Sign Boards	2						2.00
6.01b	<b>900 Octagon sign</b>					No.		<b>4.00</b>
	Stop sign	4						4.00
6.01c	<b>75 cm x 60 cm rectangular</b>					No.		<b>2.00</b>
	Chevron Signs	2						2.00
6.01d	<b>80 cm x 60 cm rectangular</b>					No.		<b>7.00</b>
	Bus Stops	7						7.00
6.02	<b>Hot applied thermoplastic compound</b>							
6.02a	<b>Lane, Centreline, Edge and other marking along strips</b>					sq.m.		<b>761.70</b>
	Edge line MCW	2	430.00	0.15				129.00
	Service Road	2	1,620.00	0.15				486.00
	Carriage way Center line	57	3.00	0.10				17.10
	Service Road	432	3.00	0.10				129.60
6.02b	<b>Directional arrows ,Pedestrian Crossings and letters</b>					sq.m.		-
6.03	Gantry mounted variable message sign board	2				No.		<b>2.00</b>
6.04	<b>Direction and Place identification</b>							
6.04a	Signs with size more than 0.9 sqm size Board.	4	1.50	1.05		sq.m.		<b>6.30</b>
6.04b	Signs with size upto 0.9 sqm size Board.	2	0.60	0.80		sq.m.		<b>0.96</b>
6.05	Road stud 100x 100 mm	967				No		<b>967.00</b>
6.06	RCC M15 grade kilometre stone							
6.06a	Ordinary kilometre stone (precast)	3				Each		<b>3.00</b>
6.06b	Hectometer stone (precast)	16				Each		<b>16.00</b>
6.07	RCC M15 grade boundary pillars	145				Each		<b>145.00</b>
<b>7</b>	<b>Bill No:- 7 DRAINAGE &amp; PROTECTION WORK</b>							
7.01	<b>Earthwork Excavation</b>					cum		<b>8,100.00</b>
		2	1,620.00	1.50	1.40			6,804.00
	For service duct	2	1,620.00	0.50	0.80			1,296.00
7.02	<b>Plain cement concrete,</b>							
7.02a	<b>Levelling Course PCC M15</b>					cum		<b>648.00</b>
	For Covered Lined Drain	2	1,620.00	1.50	0.10			486.00



**Proposed Fly over at Mohan Nagar Chowk**

Item No	Description	Dimensions					Unit	Total
		Nos	Length	Width	Depth	Area		
5.1.01	<b>Earth work Excavation</b>						<b>Cum</b>	<b>3,276.43</b>
	For Abutment A1	1	8.90	5.30	2.40			113.21
	For Abutment A2	1	8.90	5.30	2.40			113.21
	For Pier							
	P1-P15	15	8.90	8.90	2.40			2,851.56
	Reinforced earth wall	2	567.00	0.35	0.50			198.45
	<b>Total</b>							<b>3,276.43</b>
5.1.02a	<b>PCC M15 (blinding for pile cap)</b>						<b>Cum</b>	<b>128.25</b>
	For Abutment A1	1	8.90	5.30	0.10			4.72
	For Abutment A2	1	8.90	5.30	0.10			4.72
	For Pier							
	P1-P15	15	8.90	8.90	0.10			118.82
	<b>Total</b>							<b>128.25</b>
5.1.02b	<b>PCC M15</b>						<b>Cum</b>	<b>971.20</b>
	Over carriage way	0.5	607.00	16.00	0.200			971.20
	<b>Total</b>							<b>971.20</b>
5.1.02c	<b>PCC M20</b>							<b>59.54</b>
	Reinforced earth wall	2	567.00	0.35	0.15			59.54
	<b>Total</b>							<b>59.54</b>
5.1.03	<b>Cast in Situ Piles</b>						<b>Rm</b>	<b>2,996.40</b>
	For Abutment A1	6			22.70			136.20
	For Abutment A2	6			22.70			136.20
		(3*2+2)*15						
	For Pier P1 - P15	120			22.70			2,724.00
	<b>Total</b>							<b>2,996.40</b>
5.1.04	<b>Pile Liner Plate</b>						<b>M.T</b>	<b>210.94</b>
	For Abutment A1	6	3.77	0.006	9.00			9.59
	For Abutment A2	6	3.77	0.006	9.00			9.59
	For Pier P1 - P15	120	3.77	0.006	9.00			191.77
	<b>Total</b>							<b>210.94</b>
5.1.05	Pile Load Test							

	Vertical Load Test							5.00
5.1.05a	Initial Load test	2.00					No	2.00
5.1.05b	Routine Load Test	3.00					No	3.00
5.1.05c	Lateral Load Test							3.00
	Routine Load Test	3.00					No	3.00
5.1.06a	<b>Foundation M40 for pile cap</b>						<b>Cum</b>	<b>2,203.36</b>
	For Abutment A1	1	8.70	5.10	1.80			79.87
	For Abutment A2	1	8.70	5.10	1.80			79.87
	For Pier							
	P1-P15	15	8.70	8.70	1.80			2,043.63
								<b>2,203.36</b>
5.1.07a	<b>Sub Structure M50</b>						<b>Cum</b>	<b>931.84</b>
	<b>For Abutment A1</b>							
	For Abutment cap	1	12.29	1.60	1.00			19.66
	Dirt wall	1	12.29	0.30	3.05			11.25
		2	2.36	0.30	2.03			2.86
	Bracket	1	12.29	0.30	0.45			1.66
	Trestle columns	3			1.06	1.33		4.23
	<b>For Abutment A2</b>							
	For Abutment cap	1	12.29	1.60	1.00			19.66
	Dirt wall	1	12.29	0.30	3.05			11.25
		2	2.36	0.30	2.03			
	Bracket	1	12.29	0.30	0.45			1.66
	Trestle columns	3			1.79	1.33		7.13
	<b>For Pier</b>							
	P1 ( $0.725/2*(4.78+2*(5.79+7.61))+10.62$ ) = 15.287)	1					15.298	15.30
	P1 Bottom section	1			-	4.78		-
	P2 ( $0.907/2*(4.79+2*(5.21+7.07))+10.62$ ) = 18.130)	1					18.126	18.13
	P2 Bottom section	1			-	4.79		-
	P3 ( $1/2*(4.34+2*(4.96+6.8))+10.62$ ) = 19.240)	1					19.240	19.24
	P3 Bottom section	1			0.471	4.34		2.04

P4 ( $1/2*(4.34+2*(4.96+6.8))+10.62$ ) = 19.240)	1					19.240	19.24
P4 Bottom section	1			1.150	4.34		4.99
P5 ( $1/2*(4.34+2*(4.96+6.8))+10.62$ ) = 19.240)	1					19.240	19.24
P5 Bottom section	1			1.750	4.34		7.60
P6 ( $1/2*(4.34+2*(4.96+6.8))+10.62$ ) = 19.240)	1					19.240	19.24
P6 Bottom section	1			2.405	4.34		10.44
P7 ( $1/2*(4.34+2*(4.96+6.8))+10.62$ ) = 19.240)	1					19.240	19.24
P7 Bottom section	1			2.757	4.34		11.97
P8 ( $1/2*(4.34+2*(4.96+6.8))+10.62$ ) = 19.240)	1					19.240	19.24
P8 Bottom section	1			3.948	4.34		17.13
P9 ( $1/2*(4.34+2*(4.96+6.8))+10.62$ ) = 19.240)	1					19.240	19.24
P9 Bottom section	1			3.848	4.34		16.70
P10 ( $1/2*(4.34+2*(4.96+6.8))+10.62$ ) = 19.240)	1					19.240	19.24
P10 Bottom section	1			3.726	4.34		16.17
P11 ( $1/2*(4.34+2*(4.96+6.8))+10.62$ ) = 19.240)	1					19.240	19.24
P11 Bottom section	1			3.328	4.34		14.44
P12 ( $1/2*(4.34+2*(4.96+6.8))+10.62$ ) = 19.240)	1					19.240	19.24
P12 Bottom section	1			2.643	4.34		11.47
P13 ( $1/2*(4.34+2*(4.96+6.8))+10.62$ ) = 19.240)	1					19.240	19.24
P13 Bottom section	1			1.900	4.34		8.25
P14 ( $0.955/2*(4.75+2*(5.08+6.96))+10.62$ ) = 18.84)	1					18.837	18.84
P14 Bottom section	1			-	4.75		-
P15 ( $0.955/2*(4.88+2*(5.94+7.72))+10.62$ ) = 20.447)	1					20.447	20.45
P15 Bottom section	1			-	4.88		-
Bottom haunch	15	1.70	0.500	1.00			12.75
<b>Pier cap</b>							
P1-P15	15			2.50	11.26		422.06



	For Abutment A1 and A2				180.00	kg/cum		2.05
	For Abutment cap and Dirt wall				175.00	kg/cum		11.90
	For Pier P1 to P26				120.00	kg/cum		50.20
	For Pier cap				180.00	kg/cum		75.97
	For around Piers P1 - P15				100.00	kg/cum		10.66
	Pedestal				120.00	kg/cum		1.45
	Crash Barrier				45.00	Kg/m		108.63
5.1.09c	<b>In Super Structure</b>							<b>1,158.81</b>
	<b>PSC Girder</b>							
	Long Girder				120.00	kg/cum		649.31
	Cross Girder				150.00	kg/cum		78.62
	Slab				150.00	kg/cum		408.00
	Anchor beam				32.00	kg/cum		22.88
5.1.10	<b>PC Strands</b>						<b>M.T</b>	<b>405.86</b>
	strands	8*16						
	Cable C	128	40.00					134.95
	Cable B	128	40.00					135.29
	Cable A	128	40.00					135.62
								<b>405.86</b>
5.1.11	<b>Approach slab M15</b>							<b>17.85</b>
		2	17.00	3.50	0.15			17.85
	<b>Total</b>							<b>17.85</b>
5.1.12	<b>Approach slab M30</b>						<b>Cum</b>	<b>35.70</b>
		2	17.00	3.50	0.30			35.70
	<b>Total</b>							<b>35.70</b>
5.1.13	<b>Crash Barrier M40</b>						<b>Rm</b>	
5.1.13a	<b>Crash Barrier 0.26 sqm Area</b>							<b>2,414.00</b>
	<b>Approaches</b>	2	567.00					1,134.00
	<b>Flyover</b>	2	640.00					1,280.00
5.1.14	<b>RCC M40 for median</b>						<b>Cum</b>	<b>192.00</b>
	<b>Median</b>	1	640.00	1.00	0.30			192.00
	<b>Total</b>							
5.1.15a	<b>Crack inducer</b>						<b>Rm</b>	<b>102.00</b>
		6	17.00					102.00

	<b>Total</b>							<b>102.00</b>
5.1.15b	<b>Strip seal</b>						<b>Rm</b>	<b>102.00</b>
		6	17.00					102.00
	<b>Total</b>							<b>102.00</b>
5.1.16	<b>Pot PTFE bearing(350T)</b>						<b>MT</b>	<b>33,600.00</b>
5.1.16a	<b>Fixed</b>	16						<b>16.00</b>
5.1.16b	<b>Guide</b>	32						<b>32.00</b>
5.1.16c	<b>Free</b>	48						<b>48.00</b>
								<b>33,600.00</b>
5.1.17	<b>Tack Coat over Concrete Surface</b>						<b>Sqm</b>	<b>9,705.00</b>
		2	647.00	7.50				9,705.00
								<b>9,705.00</b>
5.1.18	<b>Tack Coat over Bituminous Surface</b>						<b>Sqm</b>	<b>9,705.00</b>
		2	647.00	7.50				9,705.00
								<b>9,705.00</b>
5.1.19	<b>Laying 40mm thick modified bitumen</b>						<b>Sqm</b>	<b>9,705.00</b>
		2	647.00	7.50	0.04			9,705.00
	<b>Total</b>							<b>9,705.00</b>
5.1.20	<b>Wearing Coat</b>						<b>Sqm</b>	<b>9,705.00</b>
		2	647.00	7.50				9,705.00
	<b>Total</b>							<b>9,705.00</b>
5.1.21	<b>Reinforced earthwall</b>						<b>Sqm</b>	<b>3,419.66</b>
	Sides	2	351.00		2.87			2,014.39
	Ends	1	17.00		4.62			78.47
	Sides	2	199.00		3.12			1,242.76
	Ends	1	17.00		4.94			84.05
	<b>Total</b>							<b>3,419.66</b>
5.1.22	<b>Reinforced Earthfill</b>						<b>Cum</b>	<b>1,628.57</b>
		1	351.00	17.00	2.87			1,007.19





## **Appendix E-4: Rate Analysis**

<b>SUMMARY OF RATES</b>				
<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Rate Analysis Reference</b>	<b>Rate</b>
<b>SITE CLEARANCE AND DISMANTLING</b>				
1.01	Clearing and grubbing road land in an area of light jungle	ha	1.2	48,044.00
<b>EARTH WORK</b>				
2.01	Earth work Excavation	cum	2.1	46.00
2.02	Construction of sub-grade and earthen shoulders with approved material obtained from borrow pits	cum	2.6	221.00
2.03	Construction of Median and Island with approved material	cum	2.8	83.00
2.04	Grassing with ' Doobs' Grass	sqm	10.4	5.00
<b>GRANULAR BASE COURSE AND SUB-BASE</b>				
3.01	Construction of granular sub-base	cum	3.1	2,219.00
3.02	WMM	cum	3.2	2,298.00
<b>BITUMINOUS COURSE</b>				
4.01	Primer coat	sqm	4.1	28.00
4.02	Tack coat with 0.25kg/ sqm over primed surface	sqm	4.2.2	12.00
4.03	Tack coat with 0.20kg/ sqm over bituminous surface	sqm	4.2.3	10.00
4.04	DBM	cum	4.3	7,650.00
4.05	BC (Grading-II)	cum	4.4.2	8,541.00
<b>FLYOVER</b>				
5.1.01	Earth work in excavation for foundation ( ordinary soil )		7.1.1	49.00
5.1.02	Plain cement concrete	cum		
5.1.02a	PCC Grade M15 ( For Pile cap )	cum	7.13	4,773.00
5.1.02b	PCC Grade M15	cum	7.2.1	4,966.00
5.1.02c	PCC Grade M20	cum	8.3.1	5,749.00
5.1.03	Pile Driving Height 1200m dia	m	7.10b	10,811.00
5.1.04	Pile Liner Plate	MT	7.20	58,457.00
5.1.05	Pile Load Test			
5.1.05a	a) Initial	Per Test	7.11.1	31,941.20
5.1.05b	b) routine load test	Per Test	7.11.2	20,907.00
5.1.05c	a) Lateral load test	Per Test	7.11.3	20,907.00
5.1.06	Reinforced Cement Concrete in Foundation	cum		
5.1.06a	RCC Grade M40 fo pile cap	cum	7.12.3	5,913.00
5.1.07	Reinforced Cement Concrete in sub structure			
5.1.07a	Sub Structure RCC M50	Cum	8.3.5	7,095.00
5.1.07b	Sub Structure RCC M25	Cum	8.3.3	6,406.00
5.1.08	Reinforced/ Prestressed cement concrete in super-structure			
5.1.08a	PSC Beam and Slab M50	cum	9.1.4	8,711.00
5.1.09	HYSD bar reinforcement			
5.1.09a	For Foundation	MT	7.3	53,679.00
5.1.09b	For Substructure	MT	8.4	53,754.00
5.1.09c	For Superstructure	MT	9.2	54,403.00
5.1.10	High tensile steel wires / strands	MT	9.3	88,473.00
5.1.11	PCC M-15 for levelling course of approach slab	cum	9.7	4,775.00
5.1.12	RCC of M30 grade for approach slab	cum	9.8	8,683.00
5.1.13	Crash Barrier			
5.1.13a	Crash Barrier (having cross section area 0.26 sqm)	m	6.9.2	3,746.00
5.1.14	RCC of M40 grade for median	cum	9.1.4	7,104.00
5.1.15a	Expansion joint including crack inducer slot in surfacing filled with rubber/bitumen seal	m		16,000.00
5.1.15b	Strip seal Expansion Joint	m	9.10	29,000.00

<b>SUMMARY OF RATES</b>				
<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Rate Analysis Reference</b>	<b>Rate</b>
5.1.16	POT PTFE bearing	Tonne capacity	9.11	207.00
5.1.17	Tack coat with 0.30kg/ sqm over cement concrete surface	sqm	4.2.1	15.00
5.1.18	Tack coat with 0.20kg/ sqm over bituminous surface	sqm	4.2.3	10.00
5.1.19	BC of 40mm thick	cum	4.4	8,541.00
5.1.20	25 mm thick mastic asphalt wearing course	sqm	4.5	459.00
5.1.21	Reinforced earthwall	Sqm		2,000.00
5.1.22	Reinforced earthfill	cum	2.6	221.00
5.1.23	Drainage Spouts	Each	9.6	1,060.00
5.1.24	PVC 150mm dia pipes for drainage purpose	m		300.00
5.1.25	Printing of Bridge No. and span arrangement	per cm height per letter	6.1	0.30
5.1.26	Painting two coats on new plastered concrete surfaces	Sqm	6.4	55.00
	<b>Traffic Signages, Road Marking and other Appurtenances</b>			
6.01	Cautionary, Mandatory and Informatory sign			
6.01a	90 cm equilateral triangle	No	6.2.1	3,267.00
6.01b	900 Octagon sign	No	6.2.6	4,838.00
6.01c	Chevron Signs 75 cm x 60 cm rectangular	No	6.2.5	3,091.00
6.01d	Bus Stop Signs 80 cm x 60 cm rectangular	No	6.2.4	3,902.00
6.02	Hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads			
6.02a	Lane, Centreline, Edge and other marking along strips	sq.m.	6.5	271.00
6.02b	Directional arrows and letters	sq.m.	6.5	271.00
6.03	Gantry mounted variable message sign board	No		150,000.00
6.04	Direction and Place identification			
6.04a	Signs with size more than 0.9 sqm size Board.	Sqm	6.3.2	6,930.00
6.04b	Signs with size upto 0.9 sqm size Board.	sqm	6.3.1	6,608.00
6.05	Road stud 100x 100 mm	No	6.12	230.00
6.06	RCC M15 grade kilometre stone			
6.06a	Ordinary kilometre stone (precast)	No	6.6.2	1,846.00
6.06b	Hectometer stone (precast)	No	6.6.3	496.00
6.07	RCC M15 grade boundary pillars	No	6.8	570.00
	<b>DRAINAGE &amp; PROTECTION WORK</b>			
7.01	Earthwork Excavation	cum	7.1.1	49.00
7.02	Plain cement concrete,			
7.02a	Levelling Course PCC M15	cum	7.2.1	4,966.00
7.03	RCC M25 grade	cum	7.2.3	5,695.00
7.04	HYSD	MT	7.3	53,679.00
7.05	Kerbstone	m	10.1	544.00
7.06	Painting kerbstone	sqm	6.4	55.00

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
1.2	201	<b>Clearing and Grubbing Road Land .</b>				
		Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned, up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.				
		<b>Unit = Hectare</b>				
		<b>By Mechanical Means</b>				
		<b>In area of light jungle</b>				
		<b>a) Labour</b>				
		Mate	day	0.160	140.00	22.40
		Mazdoor	day	4.000	125.00	500.00
		<b>b) Machinery</b>				
		Dozer 80 HP with attachment for removal of trees & stumps	hour	10.000	3546.00	35,460.00
		Tractor-trolley	hour	1.000	346.00	346.00
		<b>c) Overhead charges @ 15% on (a+b)</b>				5,449.26
		<b>d) Contractor's profit @ 15% on (a+b+c)</b>				6,266.65
		<b>Rate per Hectare = a+b+c+d</b>				48,044.31
					<b>say</b>	<b>48,044.00</b>
2.1	301	<b>Excavation in Soil using Hydraulic Excavator CK 90 and Tipper with Disposal upto 1000 metres.</b>				
		Excavation for roadwork in soil with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tipper, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m				
		<b>Unit = cum</b>				
		<b>Taking output = 360 cum</b>				
		<b>a) Labour</b>				
		Mate	day	0.080	140.00	11.20
		Mazdoor	day	2.000	125.00	250.00
		<b>b) Machinery</b>				
		Hydraulic excavator 0.9 cum bucket capacity @ 60 cum per hour	hour	6.000	1241.00	7,446.00
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	16.000	295.00	4,720.00
		<b>c) Overhead charges @ 15% on (a+b)</b>				1,864.08
		<b>d) Contractor's profit @ 15% on (a+b+c)</b>				2,143.69
		Cost for 360 cum = a+b+c+d				16,434.97
		<b>Rate per cum = (a+b+c+d)/360</b>				45.65
					<b>say</b>	<b>46.00</b>
2.6	305	<b>Construction of Subgrade and Earthen Shoulders</b>				
		Construction of sub-grade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2				
		<b>Unit = cum</b>				
		<b>Taking output = 100 cum</b>				
		<b>a) Labour</b>				
		Mate	day	0.040	140.00	5.60
		Mazdoor	day	1.000	125.00	125.00
		<b>b) Machinery</b>				
		Hydraulic excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1241.00	2,072.47

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		Tipper 10 tonne capacity	tonne.km	175xL	2.00	-
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				-
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	3546.00	1,773.00
		Motor grader for grading @ 50 cum per hour	hour	2.000	2283.00	4,566.00
		Water tanker with 6 km lead	hour	4.000	100.00	400.00
		Vibratory roller 8-10 tonnes @ 80 cum per hour	hour	1.250	1469.00	1,836.25
		<b>c) Material</b>				
		Cost of water	KL	24.000	40.00	960.00
		Compensation for earth taken from private land	cum	100.000	50.00	5,000.00
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				2,510.75
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				2,887.36
		Cost for 100 cum = a+b+c+d+e				22,136.43
		<b>Rate per cum = (a+b+c+d+e)/100</b>				221.36
					<b>say</b>	<b>221.00</b>
2.8	407	<b>Construction of Median and Island with Soil Taken from Roadway Cutting</b>				
		Construction of Median and Island with approved material deposited at site from roadway cutting and excavation for drain and foundation of other structures, spread, graded and compacted as per clause 407				
		<b>Unit = cum</b>				
		<b>Taking output =21 cum</b>				
		<b>a) Labour</b>				
		Mate	day	0.240	140.00	33.60
		Mazdoor	day	6.000	125.00	750.00
		<b>b) Machinery</b>				
		Water tanker 6 KL with 5 km lead and 1 trip per hour	hour	1.000	100.00	100.00
		Plate compactor @ 3.5 cum per hour	hour	6.000	32.00	192.00
		<b>c) Material</b>				
		Cost of water	KL	6.000	40.00	240.00
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				197.34
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				226.94
		Cost for 21 cum = a+b+c+d+e				1,739.88
		<b>Rate per cum = (a+b+c+d+e)/21</b>				82.85
					<b>say</b>	<b>83.00</b>
3.1	401	<b>Granular Sub-Base with Close Graded Material (Table:- 400-1)</b>				
		<b>Plant Mix Method</b>				
		Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401				
		<b>Unit = cum</b>				
		<b>Taking output = 225 cum (450 tonne)</b>				
		<b>a) Labour</b>				
		Mate	day	0.400	140.00	56.00
		Mazdoor skilled	day	2.000	140.00	280.00
		Mazdoor	day	8.000	125.00	1,000.00
		<b>b) Machinery</b>				
		Wet mix plant @ 75 tonne capacity per hour	hour	6.000	1148.00	6,888.00
		Electric generator 125 KVA	hour	6.000	665.00	3,990.00
		Water tanker 6 KL capacity 5 km lead with one trip per hour	hour	4.500	100.00	450.00
		Front end loader 1 cum bucket capacity	hour	6.000	768.00	4,608.00

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		Tipper 10 tonne	tonne.km	450 x L	2.00	-
		Add 10 per cent of cost of carriage to cover loading and unloading				-
		Motor Grader 110 HP	hour	6.000	2283.00	13,698.00
		Vibratory roller 8-10 t	hour	6.000	1469.00	8,814.00
		<b>c) Material</b>				
		Close graded Granular sub-base Material as per table 400-1				
		<b>For Grading-I Material</b>				
		53 mm to 9.5 mm @ 50 per cent	cum	144.000	1151.10	165,758.40
		9.5 mm to 2.36 mm @ 20 per cent	cum	57.000	1151.10	65,612.70
		2.36 mm below @ 30 per cent	cum	86.400	1217.90	105,226.56
		Cost of water	KL	27.000	40.00	1,080.00
		<b>Rate per cum for grading-I Material</b>				
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				56,619.25
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				65,112.14
		Cost for 225 cum = a+b+c+d+e				499,193.05
		<b>Rate per cum = (a+b+c+d+e)/225</b>				2,218.64
					<b>say</b>	<b>2,219.00</b>
<b>3.2</b>	<b>406</b>	<b>Wet Mix Macadam</b>				
		Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.				
		<b>Unit = cum</b>				
		<b>Taking output = 225 cum (495 tonnes)</b>				
		<b>a) Labour</b>				
		Mate	day	0.480	140.00	67.20
		Mazdoor skilled	day	2.000	140.00	280.00
		Mazdoor	day	10.000	125.00	1,250.00
		<b>b) Machinery</b>				
		Wet mix plant of 75 tonne hourly capacity	hour	6.600	1148.00	7,576.80
		Electric generator 125 KVA	hour	6.000	665.00	3,990.00
		Front end loader 1 cum capacity	hour	6.000	768.00	4,608.00
		Paver finisher	hour	6.000	929.00	5,574.00
		Vibratory roller 8 - 10 tonne	hour	6x0.65	1469.00	5,729.10
		or				
		Smooth 3 wheeled steel roller @ 8-10 tonnes.	hour	12.000		
		Water tanker 6 KL capacity	hour	3.000	100.00	300.00
		Tipper	tonne.km	495 x L	2.00	-
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				-
		<b>c) Material ( Table 400-11)</b>				
		45 mm to 22.4 mm@ 30 per cent	cum	89.100	1184.90	105,574.59
		22.4 mm to 2.36 mm @ 40 per cent	cum	118.800	1235.00	146,718.00
		2.36 mm to 75 micron@ 30 per cent	cum	89.100	1217.90	108,514.89
		Cost of water	KL	18.000	40.00	720.00
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				58,635.39
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				67,430.70
		Cost for 225 cum = a+b+c+d+e				516,968.66
		<b>Rate per cum = (a+b+c+d+e)/225</b>				2,297.64
					<b>say</b>	<b>2,298.00</b>
<b>4.1</b>	<b>502</b>	<b>Prime Coat</b>				

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.60 kg/sqm using mechanical means.				
		<b>Unit = sqm</b>				
		<b>Taking output = 3500 sqm</b>				
		<b>a) Labour</b>				
		Mate	day	0.080	140.00	11.20
		Mazdoor	day	2.000	125.00	250.00
		<b>b) Machinery</b>				
		Mechanical broom @ 1250 sqm per hour	hour	2.800	340.00	952.00
		Air compressor 250 cfm	hour	2.800	304.00	851.20
		Bitumen pressure distributor @ 1750 sqm per hour	hour	2.000	1022.00	2,044.00
		Water tanker 6 KL capacity @ 1 trip per hour	hour	1.000	100.00	100.00
		<b>c) Material</b>				
		Bitumen emulsion @ 0.6 kg per sqm	tonne	2.100	33045.40	69,395.34
		Cost of water	KL	6.000	40.00	240.00
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				11,076.56
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				12,738.05
		Cost for 3500 sqm = a+b+c+d+e				97,658.35
		<b>Rate per sqm = (a+b+c+d+e)/3500</b>				27.90
					<b>say</b>	<b>28.00</b>
<b>4.2.1</b>	<b>503</b>	<b>Tack Coat</b>				
		Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.3 kg per sqm on concrete surface treated with primer cleaned with mechanical broom all complete as per Technical specifications and as directed by the Engineer-in-charge.				
		<b>Unit = sqm</b>				
		<b>Taking output = 3500 sqm</b>				
		<b>a) Labour</b>				
		Mate	day	0.080	140.00	11.20
		Mazdoor	day	2.000	125.00	250.00
		<b>b) Machinery</b>				
		Mechanical broom @ 1250 sqm per hour	hour	2.800	340.00	952.00
		Air compressor 250 cfm	hour	2.800	304.00	851.20
		Emulsion pressure distributor @ 1750 sqm per hour	hour	2.000	1022.00	2,044.00
		<b>c) Material</b>				
		Bitumen emulsion @ 0.2 kg per sqm	tonne	1.050	33045.40	34,697.67
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				5,820.91
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				6,694.05
		Cost for 3500 sqm = a+b+c+d+e				51,321.03
		<b>Rate per sqm = (a+b+c+d+e)/3500</b>				14.66
					<b>say</b>	<b>15.00</b>
<b>4.2.2</b>	<b>503</b>	<b>Tack Coat</b>				
		Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.25 kg per sqm on the prepared granular surface treated with primer cleaned with mechanical broom all complete as per Technical specifications and as directed by the Engineer-in-charge.				
		<b>Unit = sqm</b>				
		<b>Taking output = 3500 sqm</b>				
		<b>a) Labour</b>				
		Mate	day	0.080	140.00	11.20
		Mazdoor	day	2.000	125.00	250.00
		<b>b) Machinery</b>				



	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		Mechanical broom @ 1250 sqm per hour	hour	2.800	340.00	952.00
		Air compressor 250 cfm	hour	2.800	304.00	851.20
		Emulsion pressure distributor @ 1750 sqm per hour	hour	2.000	1022.00	2,044.00
		<b>c) Material</b>				
		Bitumen emulsion @ 0.2 kg per sqm	tonne	0.875	33045.40	28,914.73
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				4,953.47
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				5,696.49
		Cost for 3500 sqm = a+b+c+d+e				43,673.08
		<b>Rate per sqm = (a+b+c+d+e)/3500</b>				12.48
					<b>say</b>	<b>12.00</b>
<b>4.2.3</b>	<b>503</b>	<b>Tack Coat</b>				
		Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared nominal bituminous surface cleaned with mechanical broom all complete as per Technical specifications and as directed by the Engineer-in-charge.				
		<b>Unit = sqm</b>				
		<b>Taking output = 3500 sqm</b>				
		<b>a) Labour</b>				
		Mate	day	0.080	140.00	11.20
		Mazdoor	day	2.000	125.00	250.00
		<b>b) Machinery</b>				
		Mechanical broom @ 1250 sqm per hour	hour	2.800	340.00	952.00
		Air compressor 250 cfm	hour	2.800	304.00	851.20
		Emulsion pressure distributor @ 1750 sqm per hour	hour	2.000	1022.00	2,044.00
		<b>c) Material</b>				
		Bitumen emulsion @ 0.2 kg per sqm	tonne	0.700	33045.40	23,131.78
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				4,086.03
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				4,698.93
		Cost for 3500 sqm = a+b+c+d+e				36,025.14
		<b>Rate per sqm = (a+b+c+d+e)/3500</b>				10.29
					<b>say</b>	<b>10.00</b>
<b>4.3</b>	<b>507</b>	<b>Dense Graded Bituminous Macadam</b>				
		Providing and laying dense graded bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5 per cent by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.				
		<b>Unit = cum</b>				
		<b>Taking output = 195 cum (450 tonnes)</b>				
		<b>a) Labour</b>				
		Mate	day	0.840	140.00	117.60
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	125.00	2,000.00
		Skilled mazdoor for checking line & levels	day	5.000	140.00	700.00
		<b>b) Machinery</b>				
		Batch mix HMP @ 75 tonne per hour	hour	6.000	16499.00	98,994.00
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2549.00	15,294.00

Ref. to						
	MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		Generator 250 KVA	hour	6.000	1350.00	8,100.00
		Front end loader 1 cum bucket capacity	hour	6.000	768.00	4,608.00
		Tipper 10 tonne capacity	tonne.km	450 x L	2.00	-
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				-
		smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	439.00	1,712.10
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	1469.00	5,729.10
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1090.00	4,251.00
		<b>c) Materials</b>				
		<b>Bitumen @ 4.25 per cent of weight of mix</b>	tonne	19.130	32146.18	614,956.42
		<b>Aggregate</b>				
		Total weight of mix = 450 tonnes				
		Weight of bitumen = 19.13 tonnes				
		Weight of aggregate = 450 -19.13 = 430.87 tonnes				
		<b>Taking density of aggregate = 1.5 ton/cum</b>				
		Volume of aggregate = 287.25 cum				
		<b>Grading - II19 mm (Nominal Size)</b>				
		25 - 10 mm 30 per cent	cum	86.160	1235.00	106,407.60
		10 - 5 mm 28 per cent	cum	80.430	1235.00	99,331.05
		5 mm and below 40 per cent	cum	114.900	1217.90	139,936.71
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3000.00	25,860.00
		<b>For GradingII(19 mm nominal size)</b>				
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				169,199.64
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				194,579.58
		Cost for 195 cum = a+b+c+d+e				1,491,776.80
		<b>Rate per cum = (a+b+c+d+e)/195 (For Grading-II)</b>				7,650.14
					<b>sav</b>	<b>7,650.00</b>
<b>4.4</b>	<b>509</b>	<b>Bituminous Concrete</b>				
		Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 per cent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects				
		<b>Unit = cum</b>				
		<b>Taking output = 191 cum (450 tonnes)</b>				
		<b>a) Labour</b>				
		Mate	day	0.840	140.00	117.60
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	125.00	2,000.00
		Skilled mazdoor for checking line & levels	day	5.000	140.00	700.00
		<b>b) Machinery</b>				
		Batch mix HMP @ 75 tonne per hour	hour	6.000	16499.00	98,994.00
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2549.00	15,294.00
		Generator 250 KVA	hour	6.000	1350.00	8,100.00
		Front end loader 1 cum bucket capacity	hour	6.000	768.00	4,608.00
		Tipper 10 tonne capacity	tonne.km	450 x L	2.00	-

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				-
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	439.00	1,712.10
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	1469.00	5,729.10
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1090.00	4,251.00
		<b>c) Material</b>				
		<b>i) Bitumen @ 5 per cent of weight of mix</b>	tonne	22.500	32146.18	723,289.05
		<b>ii) Aggregate</b>				
		Total weight of mix = 450 tonnes				
		Weight of bitumen = 22.5 tonnes				
		Weight of aggregate = 450 - 22.50 = 427.50 tonnes				
		<b>Taking density of aggregate = 1.5 ton/cum</b>				
		Volume of aggregate = 285 cum				
		<b>* Grading - I-19 mm (Nominal Size)</b>				
		20 - 10 mm 35 per cent	cum	99.750	1235.00	123,191.25
		10 - 5 mm 23 per cent	cum	65.550	1235.00	80,954.25
		5 mm and below 40 per cent	cum	114.000	1217.90	138,840.60
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3000.00	25,860.00
		or				
		<b>Grading - II-13 mm (Nominal Size)</b>				
		13.2 - 10 mm 30 per cent	cum	85.500	1235.00	105,592.50
		10 - 5 mm 25 per cent	cum	71.250	1235.00	87,993.75
		5 mm and below 43 per cent	cum	122.550	1217.90	149,253.65
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3000.00	25,860.00
		<b>*Any one of the alternative may be adopted as per approved design</b>				
4.4.2		<b>for Grading-II (10 mm nominal size)</b>				
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				185,024.21
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				212,777.84
		Cost for 191 cum = a+b+c+d+e				1,631,296.80
		<b>Rate per cum = (a+b+c+d+e)/191 (For Grading-II)</b>				8,540.82
					<b>say</b>	<b>8,541.00</b>
4.5	515	<b>Mastic Asphalt</b>				
		Providing and laying 25 mm thick mastic asphalt wearing course with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated finegrained hard stone chipping of 13.2 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces is not less than 1000C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.				
		<b>Unit = sqm</b>				
		<b>Taking output = 35.00 sqm (0.87 cum ) assuming a density of 2.3 tonnes/cum.-2 tonnes</b>				
		<b>a) Labour</b>				
		Mate	day	0.440	140.00	61.60
		Mazdoor	day	10.000	125.00	1,250.00
		Mazdoor skilled	day	1.000	140.00	140.00
		<b>b) Machinery</b>				
		Mechanical broom @ 1250 sqm per hour	hour	0.060	340.00	20.40
		Air compressor 250 cfm	hour	0.060	304.00	18.24
		Mastic cooker 1 tonne capacity	hour	6.000	59.00	354.00
		Bitumen boiler 1500 litres capacity	hour	6.000	189.00	1,134.00

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.000	346.00	346.00
		<b>c) Material</b>				
		Base mastic (without coarse aggregates) = 60 per cent				
		Coarse aggregate (6.3mm to 13.2 mm) = 40 per cent .				
		Proportion of material required for mastic asphalt with coarse aggregates (based on mix design done by CRRRI for a specific case)				
		i) Bitumen 85/25 or 30/40 @ 10.2 per cent by weight of mix. $2 \times 10.2/100 = 0.204$	tonne	0.204	32146.18	6,557.82
		ii) Fine aggregate passing 2.36mm and retained on 0.075mm sieve @ 31.9 per cent by weight of mix = $2 \times 31.9/100 = 0.638$ tonnes = $0.638/1.625 = 0.39$	cum	0.390	1166.70	455.01
		iii) Lime stone dust filler with calcium content not less than 80 per cent by weight @ 17.92 per cent by weight of mix = $2 \times 17.92/100 = 0.36$	tonne	0.360	3000.00	1,080.00
		iv) Coarse aggregates 6.3 mm to 13.2 mm @ 40 per cent by weight of mix = $2 \times 40/100 = 0.8$ MT = $0.8/1.456 = 0.55$	cum	0.550	1235.00	679.25
		v) Pre-coated stone chips of 13.2 mm nominal size for skid resistance = $35 \times 0.005/10 = 0.018$	cum	0.018	1296.75	23.34
		vi) Bitumen for coating of chips @ 2 per cent by weight = $0.018 \times 1.456 \times 2/100 = 0.0005$ MT = 0.5kg	kg	0.500	32.00	16.00
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				1,820.35
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				2,093.40
		Cost for 35.00 sqm = a+b+c+d+e				16,049.42
		<b>Rate per sqm = (a+b+c+d+e)/35</b>				458.55
					<b>say</b>	<b>459.00</b>
<b>6.1</b>	<b>801</b>	<b>Printing New Letter and Figures of any Shade</b>				
		Printing new letter and figures of any shade with synthetic enamel paint black or any other approved colour to give an even shade				
		<b>English and Roman</b>				
		Hyphens and the like not to be measured and paid for				
		Detail for 100 letters of 16 cm height. i.e.1600 cm				
		Unit = per cm height per letter				
		<b>a) Labour</b>				
		Mate	day	0.070	140.00	9.80
		Painter 1st class	day	1.250	200.00	250.00
		Mazdoor	day	0.500	125.00	62.50
		<b>b) Material</b>				
		Paint	Litre	0.500	172.00	86.00
		<b>c) Overhead charges @ 15% on (a+b)</b>				61.25
		<b>d) Contractor's profit @ 15% on (a+b+c)</b>				70.43
		Cost for 1600 cm = a+b+c+d				539.98
		<b>Rate per cm height per letter = (a+b+c +d)/1600</b>				0.34
					<b>say</b>	<b>0.30</b>
<b>6.2</b>	<b>801</b>	<b>Retro-Reflectorised Traffic Signs</b>				

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		Providing and fixing of retro- reflectorised cautionary, mandatory and informatory sign as per IRC :67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing				
		<b>Unit = Each</b>				
		<b>Taking output = one traffic sign</b>				
		<b>i) Excavation for foundation</b>	cum	0.216	138.00	29.81
		<b>ii) Cement concrete M15 grade</b>	cum	0.120	4966.00	595.92
		<b>iii) Painting angle iron post two coats</b>	sqm	0.430	45.00	19.35
		<b>a) Labour (For fixing at site)</b>				
		Mate	day	0.010	140.00	1.40
		Mazdoor	day	0.250	125.00	31.25
		<b>b) Material</b>				
		Mild steel angle iron 75 x 75 x 6 mm	kg	19.000	34.50	655.50
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting of size including lettering and signs as applicable				
		Add 2 per cent of cost of angle iron towards cost of drilling holes, nuts, bolts etc.				
		90 cm equilateral triangle	sqm	0.350	3689.00	1,291.15
		or				
		60 cm equilateral triangle	sqm	0.156	3689.00	575.48
		or				
		60 cm circular	sqm	0.283	3689.00	1,043.99
		or				
		80 mm x 60 mm rectangular	sqm	0.480	3689.00	1,770.72
		or				
		60 cm x 45 cm rectangular	sqm	0.270	3689.00	996.03
		or				
		60 cm x 60 cm square	sqm	0.360	3689.00	1,328.04
		or				
		90 cm high octagon	sqm	0.672	3689.00	2,479.01
		or				
		60 cm x 75 cm rectangular	sqm	0.450	3689.00	1,660.05
		<b>c) Machinery</b>				
		Tractor-trolley	hour	0.010	346.00	3.46
6.2.1		<b>90 cm equilateral triangle</b>				
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				297.41
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				342.03
		<b>Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)</b>				3,267.28
					<b>say</b>	<b>3,267.00</b>
6.2.2		<b>60 cm equilateral triangle</b>				
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				190.06
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				218.57
		<b>Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)</b>				2,320.81
					<b>say</b>	<b>2,321.00</b>
6.2.3		<b>60 cm circular</b>				
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				260.34
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				299.39
		<b>Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)</b>				2,940.41
					<b>say</b>	<b>2,940.00</b>
6.2.4		<b>80 mm x 60 mm rectangular</b>				
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				369.35
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				424.75
		<b>Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)</b>				3,901.51
					<b>say</b>	<b>3,902.00</b>

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
6.2.5		60 cm x 75 cm rectangular				
		d) Overhead charges @ 15% on (a+b+c)				352.75
		e) Contractor's profit @ 15% on (a+b+c+d)				405.66
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				3,091.13
					say	<b>3,091.00</b>
6.2.6		60 cm x 60 cm square				
		d) Overhead charges @ 15% on (a+b+c)				302.95
		e) Contractor's profit @ 15% on (a+b+c+d)				348.39
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				3,316.07
					say	<b>3,316.00</b>
6.2.6		90 cm high octagon				
		d) Overhead charges @ 15% on (a+b+c)				475.59
		e) Contractor's profit @ 15% on (a+b+c+d)				546.93
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				4,838.22
					say	<b>4,838.00</b>
6.3.1	801	<b>Direction and Place Identification Signs upto 0.9 sqm Size Board.</b>				
		Providing and erecting direction and place identification retro-reflectorised sign as per IRC:67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 2 mm thick with area not exceeding 0.9 sqm supported on a mild steel single angle iron post 75 x 75 x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 x 45 x 60 cm, 60 cm below ground level as per approved drawing				
		<b>Unit = sqm</b>				
		<b>Taking output = 0.9 sqm</b>				
		i) Excavation for foundation	cum	0.216	138.00	29.81
		ii) Cement concrete M15 grade	cum	0.120	4966.00	595.92
		iii) Painting angle iron post two coats	sqm	0.430	45.00	19.35
		<b>a) Labour (For fixing at site)</b>				
		Mate	day	0.010	140.00	1.40
		Mazdoor	day	0.200	125.00	25.00
		<b>b) Material</b>				
		Mild steel angle iron 75 mm x 75 mm x 6 mm, 2.85 metres long	kg	19.000	34.50	655.50
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting of size 0.9 sqm	sqm	0.900	3689.00	3,320.10
		Add 2 per cent of cost of materials for drilling holes, nuts, bolts, fabrication etc.				
		<b>c) Machinery</b>				
		Tractor-trolley	hour	0.020	346.00	6.92
		d) Overhead charges @ 15% on (a+b+c)				601.34
		e) Contractor's profit @ 15% on (a+b+c+d)				691.54
		Cost for 0.9 sqm = i+ii+iii+ a+b+c+d+e				5,946.87
		Rate per sqm (for sign having area upto 0.9 sqm) = (I+ii+iii+a+b+c+d+e)/0.90				6,607.64
					say	<b>6,608.00</b>
6.3.2	801	<b>Direction and Place Identification Signs with size more than 0.9 sqm size Board.</b>				

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		Providing and erecting direction and place identification retro- reflectorised sign as per IRC :67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 2 mm thick with area exceeding 0.9 sqm supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm, 2 Nos. firmly fixed to the ground by means of properly designed foundation with M 15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing				
		<b>Unit = sqm</b>				
		<b>Taking output = 1.50 sqm</b>				
		<b>i) Excavation for foundation</b>	cum	0.430	138.00	59.34
		<b>ii) Cement concrete M15 grade</b>	cum	0.240	4966.00	1,191.84
		<b>iii) Painting angle iron post 2 coats</b>	sqm	0.860	45.00	38.70
		<b>a) Labour (For fixing at site)</b>				
		Mate	day	0.010	140.00	1.40
		Mazdoor	day	0.300	125.00	37.50
		<b>b) Material</b>				
		Mild steel angle iron 75 mm x 75 mm x 6 mm, 2.85 metres long, 2 nos	kg	38.000	34.50	1,311.00
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting	sqm	1.500	3689.00	5,533.50
		Add 2 per cent of cost of materials for drilling holes, nuts, bolts, fabrication etc.				
		<b>c) Machinery</b>				
		Tractor-trolley	hour	0.020	346.00	6.92
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				1,027.71
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				1,187.70
		Cost for 1.5 sqm = i+ii+iii+ a+b+c+d+e				10,395.62
		<b>Rate per sqm ( for sign having area more than 0.9 sqm) = ( i+ii+iii+a+b+c+d+e)/1.50</b>				6,930.41
					<b>say</b>	<b>6,930.00</b>
<b>6.4</b>	<b>803</b>	<b>Painting Two Coats on New Concrete Surfaces</b>				
		Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces				
		<b>Unit = sqm</b>				
		<b>Taking output = 40 sqm</b>				
		<b>a) Labour</b>				
		Mate	day	0.120	140.00	16.80
		Painter	day	2.000	200.00	400.00
		Mazdoor	day	1.000	125.00	125.00
		<b>b) Material</b>				
		Paint conforming to requirement of clause 803.3.	Litre	6.000	172.00	1,032.00
		Add for scaffolding @ 1 per cent of labour cost where required				10.32
		Add @ 5 per cent cost of labour and materials to prepare the surface by filling minuts roughness on the surface and priming the surface before laying 2 coats of painting.				78.69
		<b>c) Overhead charges @ 15% on (a+b)</b>				249.42
		<b>d) Contractor's profit @ 15% on (a+b+c)</b>				286.83
		Cost for 40 sqm = a+b+c+d				2,199.07
		<b>Rate per sqm = (a+b+c+d)/40</b>				54.98
					<b>say</b>	<b>55.00</b>

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
6.5	803	<b>Road Marking with Hot Applied Thermoplastic Compound with Reflectorising Glass Beads on Bituminous Surface</b>				
		Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes.				
		<b>Unit = sqm</b>				
		<b>Taking output = 640 sqm</b>				
		<b>a) Labour</b>				
		Mate	day	0.500	140.00	70.00
		Mazdoor	day	2.000	125.00	250.00
		<b>b) Machinery</b>				
		Road marking machine @ 80 sqm per hour	hour	8.000	89.00	712.00
		Tractor-trolley	hour	8.000	346.00	2,768.00
		<b>c) Material</b>				
		Hot applied thermoplastic compound	Litre	2000.000	55.00	110,000.00
		Reflectorising glass beads	kg	200.000	45.00	9,000.00
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				18,420.00
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				21,183.00
		Cost for 640 sqm = a+b+c+d+e				162,403.00
		<b>Rate per sqm = (a+b+c+d+e)/640</b>				270.67
					<b>say</b>	<b>271.00</b>
	804	<b>Kilometre Stone</b>				
6.6		Reinforced cement concrete M15grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and printing etc				
6.6.1		<b>5th kilometre stone (precast)</b>				
		<b>Unit = Nos.</b>				
		<b>Taking output = 6 Nos.</b>				
		<b>a) M-15 grade of concrete</b>	cum	2.350	4966.00	11,670.10
		<b>b) Steel reinforcement @ 5 kg per sqm</b>	kg	22.080	53.76	1,186.98
		<b>c) Excavation in soil for foundation</b>	cum	1.680	138.00	231.84
		<b>d) Painting two coats on concrete surface</b>	sqm	9.850	52.00	512.20
		<b>e) Lettering on km post (average 30 letters of 10 cm height each)</b>	per cm per letter	1800.000	0.30	540.00
		<b>Transportation and fixing</b>				
		<b>f) Labour</b>				
		Mate	day	0.260	140.00	36.40
		Mason	day	0.600	200.00	120.00
		Mazdoor including loading/unloading	day	6.000	125.00	750.00
		<b>g) Machinery</b>				
		Tractor-trolley	hour	6.000	346.00	2,076.00
		<b>h) Overhead charges @ 15% on (f+g)</b>				447.36
		<b>i) Contractor's profit @ 15% on (f+g+h)</b>				514.46
		Cost for 6 Nos. 5th km stone = a+b+c+ d+e +f+g+h +i				18,085.34
		<b>Rate for each 5th km stone = (a+b+c+ d+e +f+g+h +i ) /6</b>				3,014.22
					<b>say</b>	<b>3,014.00</b>
6.6.2		<b>Ordinary kilometer stone (precast)</b>				
		<b>Unit = Nos.</b>				
		<b>Taking output = 14 Nos.</b>				
		<b>a) M-15 grade of concrete</b>	cum	3.770	4966.00	18,721.82
		<b>b) Steel reinforcement @ 5 kg per sqm</b>	kg	26.320	53.76	1,414.91
		<b>c) Excavation in soil for foundation</b>	cum	2.770	138.00	382.26



	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		<b>d) Painting two coats on concrete surface</b>	sqm	11.410	52.00	593.32
		<b>e) Lettering on km post ( average 12 letters of 10 cm height each)</b>	per cm per letter	1680.000	0.30	504.00
		<b>Transportation and fixing</b>				
		<b>f) Labour</b>				
		Mate	day	0.320	140.00	44.80
		Mason	day	1.000	200.00	200.00
		Mazdoor	day	7.000	125.00	875.00
		<b>g) Machinery</b>				
		Tractor-trolley	hour	6.000	346.00	2,076.00
		<b>h) Overhead charges @ 15% on (f+g)</b>				479.37
		<b>i) Contractor's profit @ 15% on (f+g+h)</b>				551.28
		Cost for 14 Nos. ordinary km stone = (a+b+ c +d+e+f+g+h+i)				25,842.76
		<b>Rate for each ordinary km stone = (a+b+ c +d+e+f+g+h+i) /14</b>				1,845.91
					<b>say</b>	<b>1,846.00</b>
<b>6.6.3</b>		<b>Hectometer stone (precast)</b>				
		<b>Unit = Nos.</b>				
		<b>Taking output = 33 Nos.</b>				
		<b>a) M-15 grade of concrete</b>	cum	1.580	4966.00	7,846.28
		<b>b) Steel reinforcement @ 5 kg per sqm</b>	kg	66.000	53.76	3,548.03
		<b>c) Excavation in soil for foundation</b>	cum	1.390	138.00	191.82
		<b>d) Painting two coats on concrete surface</b>	sqm	6.270	52.00	326.04
		<b>e) Lettering on km post (average 1 letter of 10 cm height each)</b>	per cm per letter	330.000	0.30	99.00
		<b>Transportation and fixing</b>				
		<b>f) Labour</b>				
		Mate	day	0.340	140.00	47.60
		Mason	day	1.500	200.00	300.00
		Mazdoor	day	7.000	125.00	875.00
		<b>g) Machinery</b>				
		Tractor-trolley	hour	6.000	346.00	2,076.00
		<b>h) Overhead charges @ 15% on (f+g)</b>				494.79
		<b>i) Contractor's profit @ 15% on (f+g+h)</b>				569.01
		Cost for 33 Nos. Hectometer stone = (a+b +c +d+e+f+g+h+i)				16,373.57
		<b>Rate for each Hectometer stone = (a+b +c +d+e+f+g+h+i) 33</b>				496.17
					<b>say</b>	<b>496.00</b>
<b>6.8</b>	<b>806</b>	<b>Boundary pillar</b>				
		Reinforced cement concrete M15 grade boundary pillars of standard design as per IRC:25-1967, fixed in position including finishing and lettering but excluding painting				
		<b>Unit = Each</b>				
		<b>Taking output = 57 Nos.</b>				
		<b>a) M-15 grade of the boundary stone</b>	cum	1.250	4966.00	6,207.50
		<b>b) Steel reinforcement</b>	kg	79.800	53.76	4,289.89
		<b>c) Excavation in soil</b>	cum	10.720	138.00	1,479.36
		<b>d) Lettering, each 10 cm high</b>	per letter per cm high	2280.000	0.30	684.00
		<b>Transportation and fixing</b>				
		<b>e) Labour</b>				
		Mate	day	0.570	140.00	79.80
		Mazdoor	day	14.250	125.00	1,781.25
		<b>f) Machinery</b>				
		Tractor-trolley	hour	6.000	346.00	2,076.00

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		<b>g) Material</b>				
		Stone spall	cum	11.970	924.70	11,068.66
		<b>h) Overhead charges @ 15% on (e+f+g)</b>				2,250.86
		<b>i) Contractor's profit @ 15% on (e+f+g+h)</b>				2,588.48
		Cost for 57 Nos. boundary pillar = (a+b+c+d+e+f+g+h+i)				32,505.80
		<b>Rate for each boundary pillar = (a+b+c+d+e+f+g+h+i)/57</b>				570.28
					<b>say</b>	<b>570.00</b>
<b>6.9</b>	<b>809</b>	<b>Reinforced Cement Concrete Crash Barrier</b>				
		Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-40 grade concrete with HYSD reinforcement conforming to IRC:21 and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MOST circular No. RW/NH - 33022/1/94-DO III dated 24 June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified				
		<b>Unit = Linear metre</b>				
		Taking output = 10 m				
<b>6.9.2</b>		<b>a) M 40 grade concrete (0.26 sqm)</b>				
		<b>M 40 grade concrete</b>	cum	2.600	7544.00	19,614.40
		<b>b) Labour</b>				
		Mate	day	0.040	140.00	5.60
		Mazdoor	day	1.000	125.00	125.00
		<b>c) Material</b>				
		HYSD steel reinforcement including dowel bars	tonne	0.374	35700.00	13,351.80
		Pre-moulded asphalt filler board	sqm	0.320	25.00	8.00
		<b>d) Overhead charges @ 15% on (b+c)</b>				2,023.56
		<b>e) Contractor's profit @ 15% on (b+c+d)</b>				2,327.09
		Cost for 10 metre = a+b+c+d+e				37,455.45
		<b>Rate per metre = (a+b+c+d+e)/10</b>				3,745.55
					<b>say</b>	<b>3,746.00</b>
<b>6.12</b>	<b>Suggestive</b>	<b>Road Markers/Road Stud with Lense Reflector</b>				
		Providing and fixing of road stud 100 x 100 mm, die-cast in aluminium, resistant to corrosive effect of salt and grit, fitted with lense reflectors, installed in concrete or asphaltic surface by drilling hole 30 mm upto a depth of 60 mm and bedded in a suitable bituminous grout or epoxy mortar, all as per BS 873 part 4:1973				
		<b>Unit = Nos</b>				
		Taking output = 50Nos				
		<b>a) Labour</b>				
		Mate	day	0.040	140.00	5.60
		Mazdoor	day	1.000	125.00	125.00
		<b>b) Material</b>				
		Aluminium studs 100 x 100 mm fitted with lense reflectors	each	50.000	155.63	7,781.50
		Add 10 per cent of cost of material for fixing and installation				778.15
		<b>c) Overhead charges @ 15% on (a+b)</b>				1,303.54
		<b>d) Contractor's profit @ 15% on (a+b+c)</b>				1,499.07
		Cost for 50 studs = a+b+c+d				11,492.86

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		<b>Rate per studs = (a+b+c+d)/50</b>				229.86
					<b>say</b>	<b>230.00</b>
<b>7.1</b>	<b>304</b>	<b>Excavation for Structures</b>				
		Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.				
<b>7.1.1</b>		<b>Ordinary soil</b>				
		<b>Unit = cum</b>				
		<b>Taking output = 10 cum</b>				
		<b>Mechanical Means</b>				
		<b>Depth upto 3 m</b>				
		<b>Unit = cum</b>				
		<b>Taking output = 240 cum</b>				
		<b>a) Labour</b>				
		Mate	day	0.32	140.00	44.80
		Mazdoor	day	8.00	125.00	1,000.00
		<b>b) Machinery</b>				
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1241.00	7,446.00
		<b>c) Overhead charges @ 20% on (a+b)</b>				1,698.16
		<b>d) Contractor's profit @ 15% on (a+b+c)</b>				1,528.34
		Cost for 240 cum = a+b+c+d				11,717.30
		<b>Rate per cum = (a+b+c+d)/240</b>				48.82
					<b>say</b>	<b>49.00</b>
<b>7.2</b>	<b>1500, 1700 &amp; 2100</b>	<b>Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.</b>				
<b>7.2.1</b>		<b>PCC Grade M15</b>				
		<b>Unit = cum</b>				
		<b>Taking output = 15 cum</b>				
		<b>a) Material</b>				
		Cement	tonne	4.13	4620.00	19,080.60
		Coarse sand	cum	6.75	1506.65	10,169.89
		40 mm Aggregate	cum	8.10	1184.90	9,597.69
		20 mm Aggregate	cum	4.05	1235.00	5,001.75
		10 mm Aggregate	cum	1.35	1235.00	1,667.25
		<b>b) Labour</b>				
		Mate	day	0.86	140.00	120.40
		Mason	day	1.50	200.00	300.00
		Mazdoor	day	20.00	125.00	2,500.00
		<b>c) Machinery</b>				
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	222.00	1,332.00
		Generator 63 KVA	hour	6.00	355.00	2,130.00
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3460.00</b>		
		<b>d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery</b>				2,075.98
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				10,795.11
		<b>f) Contractor's profit @ 15% on (a+b+c+d+e)</b>				9,715.60
		Cost for 15 cum = a+b+c+d+e+f				74,486.27
		<b>Rate per cum = (a+b+c+d+e+f)/15</b>				4,965.75
					<b>say</b>	<b>4,966.00</b>
<b>7.2.3</b>		<b>RCC Grade M25</b>				
		<b>With Batching Plant, Transit Mixer and Concrete Pump</b>				

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		<b>Unit: cum</b>				
		<b>Taking Output = 120 cum</b>				
		<b>a) Material</b>				
		Cement	tonne	48.38	4620.00	223,515.60
		Coarse sand	cum	54.00	1506.65	81,359.10
		20 mm Aggregate	cum	64.80	1235.00	80,028.00
		10 mm Aggregate	cum	43.20	1235.00	53,352.00
		<b>b) Labour</b>				
		Mate	day	0.84	140.00	117.60
		Mason	day	3.00	200.00	600.00
		Mazdoor	day	18.00	125.00	2,250.00
		<b>c) Machinery</b>				
		Batching Plant @ 20 cum/hour	hour	6.00	2128.00	12,768.00
		Generator 100 KVA	hour	6.00	665.00	3,990.00
		Loader 1 cum capacity 1 cum	hour	6.00	768.00	4,608.00
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	886.00	13,290.00
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	2.35	-
		Concrete Pump	hour	6.00	244.00	1,464.00
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3978.00</b>		
		<b>d) Formwork @ 3.75 per cent on cost of concrete i.e. cost of material, labour and machinery</b>				17,900.34
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				99,048.53
		<b>f) Contractor's profit @ 15% on (a+b+c+d+e)</b>				89,143.67
		cost of 120 cum = a+b+c+d+e+f				683,434.84
		<b>Rate per cum (a+b+c+d+e+f)/120</b>				5,695.29
					<b>say</b>	<b>5,695.00</b>
7.10b	1100,1600 & 1700	<b>Bored cast-in-situ M40 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and Technical Specifications and removal of excavated earth with all lifts and lead upto 1000 m.</b>				
		<b>Pile diameter-1200 mm</b>				
		<b>Unit = meter</b>				
		<b>Taking output = 10 m</b>				
		<b>a) Materials</b>				
		PCC Grade M40	cum	10.17	4322.00	43,954.74
		<b>Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( C ) (IV)</b>				
		Concrete to be cast with a tremie pipe 200mm dia.				
		<b>b) Machinery( for boring and construction )</b>				
		Hire and running charges of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.	hour	6.00	5208.00	31,248.00
		Hire and running charges of light crane for lowering reinforcement cage	hour	0.50	340.00	170.00
		Hire and running charges of Bentonite pump	hour	6.00	Rate included in piling rig	
		Loader 1 cum bucket capacity.	hour	0.50	768.00	384.00
		Tipper 5.5 cum capacity for disposal of muck from pile bore hole	hour	0.50	295.00	147.50
		Bentonite	kg	385.00	4.80	1,848.00
		<b>c) Labour</b>				
		Mate/Supervisor	day	0.18	140.00	25.20
		Mazdoor	day	4.50	125.00	562.50
		<b>d) Overhead charges @ 20% on (b+c)</b>				15,667.99
		<b>e) Contractor's profit @ 15% on (b+c+d)</b>				14,101.19
		Cost for 10 m = a+b+c+d+e				108,109.12
		<b>Rate per metre (a+b+c+d+e)/10</b>				10,810.91

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
					say	<b>10,811.00</b>
7.11	1100	<b>Pile Load Test on single Vertical Pile in accordance with IS:2911(Part-IV)</b>				
		<b>Unit = 1 MT</b>				
		<b>Taking output = 1 MT</b>				
7.11.1		a) Initial test	Per test	1.00	31941.20	From CPWD SOR Delhi
7.11.2		b) Routine test	Per test	1.00	20907.00	From CPWD SOR Delhi
7.11.3		a) Lateral load test	Per test	1.00	20907.00	From CPWD SOR Delhi
		Although, this item is incidental to work and is not required to be included in BOQ of contract, the same is required to be added in the estimate to assess cost of work.				
7.20	1200 & 1900	<b>Providing Steel Liner 10 mm thick for Curbs and 6 mm thick for Steining of Wells including Fabricating and Setting out as per Detailed Drawing.</b>				
		<b>Unit = 1 MT</b>				
		<b>Taking output = 1 MT</b>				
		<b>a) Material</b>				
		i) Structural steel including 5 per cent wastage	tonne	1.05	34500.00	36,225.00
		<b>b) Labour</b>				
		Mate	day	1.24	140.00	173.60
		Fitter	day	6.00	150.00	900.00
		Blacksmith	day	5.00	200.00	1,000.00
		Welder	day	5.00	200.00	1,000.00
		Mazdoor	day	10.00	125.00	1,250.00
		Electrodes, cutting gas and other consumables @ 5 per cent on cost a (a) above.				1,811.25
		<b>c) Overhead charges @ 20% on (a+b)</b>				8,471.97
		<b>d) Contractor's profit @ 15% on (a+b+c)</b>				7,624.77
		<b>Rate for per MT (a+b+c)</b>				58,456.59
					say	<b>58,457.00</b>
7.12	1100, 1500 & 1700	<b>Cement Concrete for Reinforced Concrete in Pile Cap complete as per Drawing and Technical Specification</b>				
7.12.3		<b>RCC Grade M40</b>				
		<b>Unit = cum</b>				
		<b>Taking output = 15 cum</b>				
		<b>Using Batching Plant, Transit Mixer and Concrete Pump</b>				
		<b>a) Material</b>				
		Cement	tonne	6.45	4620.00	29,799.00
		Coarse sand	cum	6.75	1506.65	10,169.89
		20 mm Aggregate	cum	8.10	1235.00	10,003.50
		10 mm Aggregate	cum	5.40	1235.00	6,669.00
		<b>b) Labour</b>				
		Mate	day	0.16	140.00	22.40
		Mason	day	0.38	190.00	72.20
		Mazdoor for concreting	day	2.50	125.00	312.50
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	125.00	125.00
		<b>c) Machinery</b>				
		Batching Plant @ 20 cum/hour	hour	0.75	2128.00	1,596.00

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		Generator 100 KVA	hour	0.75	665.00	498.75
		Loader (capacity 1 cum)	hour	0.75	768.00	576.00
		Transit Mixer ( capacity 4.0 cu.m )				
		Lead upto 1 Km	hour	2.00	886.00	1,772.00
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	2.35	-
		Concrete Pump	hour	0.75	244.00	183.00
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				2,471.97
		<b>d) Overhead charges @ 20% on (a+b+c)</b>				12,854.24
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				11,568.82
		Cost for 15 cum = a+b+c+d+e				88,694.27
		<b>Rate per metre (a+b+c+d+e)/15</b>				5,912.95
					<b>say</b>	<b>5,913.00</b>
<b>7.13</b>	<b>1100&amp;1700</b>	<b>Levelling Course for Pile cap</b>				
		<b>Providing and laying of PCC M15 levelling course 100mm thick below the pile cap.</b>				
		<b>Unit = cum</b>				
		<b>Taking output = 15 cum</b>				
		<b>a) Material</b>				
		Cement	tonne	4.13	4620.00	19,080.60
		Coarse sand	cum	6.75	1506.65	10,169.89
		40 mm aggregate	cum	8.10	1184.90	9,597.69
		20 mm Aggregate	cum	4.05	1235.00	5,001.75
		10 mm Aggregate	cum	1.35	1235.00	1,667.25
		<b>b) Labour</b>				
		Mate	day	0.86	140.00	120.40
		Mason	day	1.50	190.00	285.00
		Mazdoor	day	20.00	125.00	2,500.00
		<b>c) Machinery</b>				
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	222.00	1,332.00
		Generator 33 KVA	hour	6.00	355.00	2,130.00
		<b>d) Overhead charges @ 20% on (a+b+c)</b>				10,376.92
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				9,339.22
		Cost for 15 cum = a+b+c+d+e				71,600.72
		<b>Rate per metre (a+b+c+d+e)/15</b>				4,773.38
					<b>say</b>	<b>4,773.00</b>
<b>7.3</b>	<b>1600</b>	<b>Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications.</b>				
		<b>Unit = 1 MT</b>				
		<b>Taking output = 1 MT</b>				
		<b>a) Material</b>				
		HYSD bars including 5 per cent overlaps and wastage	tonne	1.05	35700.00	37,485.00
		Binding wire	Kg	6.00	34.50	207.00
		<b>b) Labour for cutting, bending, shifting to site, tying and placing in position</b>				
		Mate	day	0.40	140.00	56.00
		Blacksmith	day	2.00	200.00	400.00
		Mazdoor	day	6.00	125.00	750.00
		<b>c) Overhead charges @ 20% on (a+b)</b>				7,779.60
		<b>d) Contractor's profit @ 15% on (a+b+c)</b>				7,001.64
						53,679.24
					<b>say</b>	<b>53,679.00</b>
<b>8.3</b>	<b>1500, 1700 &amp; 2200</b>	<b>Plain/Reinforced cement concrete in sub-structure complete as per drawing and Technical Specifications</b>				

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		<b>Unit = cum</b>				
		<b>Taking output = 1 cum</b>				
8.3.1		<b>PCC Grade M20</b>				
		<b>Height upto 5m</b>				
		Same as Item 12.8 (B) upto 5 m height, except for formwork which shall be 10 per cent instead of 4 per cent of cost of material, labour and machinery.				
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c) of Item 12.8 (B)</b>				3,787.00
		<b>d) formwork</b>				
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		378.70
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				833.14
		<b>f) Contractor's profit @ 15% on (a+b+c+d+e)</b>				749.83
		<b>Rate per m (a+b+c+d+e+f)</b>				5,748.67
					say	<b>5,749.00</b>
8.3.3		<b>RCC Grade M25</b>				
		<b>Height upto 5m</b>				
		Same as Item 12.8 (E) upto 5m height, excluding formwork. For cost of formwork, add 10 per cent of cost of material, labour and machinery instead of 3.75 per cent .				
		<b>With Batching Plant, Transit Mixer and Concrete Pump</b>				
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c) of Item 12.8 (E) Case II</b>				4,220.00
		<b>d) formwork</b>				
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		422.00
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				928.40
		<b>f) Contractor's profit @ 15% on (a+b+c+d+e)</b>				835.56
		<b>Rate perm (a+b+c+d+e+f)</b>				6,405.96
					say	<b>6,406.00</b>
8.3.5		<b>RCC Grade M50</b>				
		<b>Height upto 5m</b>				
		Same as Item 12.8 (G) upto 5m height, excluding formwork. For cost of formwork, add 10 per cent of cost of material, labour and machinery instead of 3.5 per cent .				
		<b>With Batching Plant, Transit Mixer and Concrete Pump</b>				
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c) of Item 12.8 (G) Case II</b>				4,674.00
		<b>d) formwork</b>				
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		467.40
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				1,028.28
		<b>f) Contractor's profit @ 15% on (a+b+c+d+e)</b>				925.45
		<b>Rate perm (a+b+c+d+e+f)</b>				7,095.13
					say	<b>7,095.00</b>
8.4	Section 1600 & 2200	<b>Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and Technical Specifications</b>				
		<b>Output: MT</b>				
		<b>Taking output = 1 MT</b>				
		<b>a) Material</b>				
		HYSD bars including 5 per cent overlaps and wastage	tonne	1.05	35700.00	37,485.00
		Binding wire	kg	6.00	34.50	207.00

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		<b>b) Labour for cutting, bending, shifting to site, tying and placing in position</b>				
		Mate	day	0.34	140.00	47.60
		Blacksmith	day	2.00	200.00	400.00
		Mazdoor	day	6.50	125.00	812.50
		<b>c) Overhead charges @ 20% on (a+b)</b>				7,790.42
		<b>d) Contractor's profit @ 15% on (a+b+c)</b>				7,011.38
		<b>Rate for per MT (a+b+c+d)</b>				53,753.90
					<b>say</b>	<b>53,754.00</b>
<b>9.1</b>	<b>1500 &amp; 1600 &amp; 1700</b>	<b>Furnishing and Placing Reinforced/ Prestressed cement concrete in super-structure as per drawing and Technical Specification</b>				
<b>9.1.4</b>		<b>PSC Grade M-50</b>				
		<b>Unit = 1 cum</b>				
		<b>Taking output = 120 cum</b>				
		<b>a) Material</b>				
		Cement	tonne	58.80	4620.00	271,656.00
		Coarse sand	cum	54.00	1506.65	81,359.10
		20 mm Aggregate	cum	64.80	1235.00	80,028.00
		10 mm Aggregate	cum	43.20	1235.00	53,352.00
		Admixture @ 0.4 per cent of cement	kg	235.20	150.00	35,280.00
		<b>b) Labour</b>				
		Mate	day	0.94	140.00	131.60
		Mason	day	3.50	200.00	700.00
		Mazdoor	day	20.00	125.00	2,500.00
		<b>c) Machinery</b>				
		Batching Plant @ 20 cum/hour	hour	6.00	2128.00	12,768.00
		Generator 100 KVA	hour	6.00	665.00	3,990.00
		Loader	hour	6.00	768.00	4,608.00
		Transit Mixer ( capacity 4.0 cu.m )				
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	886.00	13,290.00
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	2.35	-
		Concrete Pump	hour	6.00	244.00	1,464.00
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>561127.00</b>		
		<b>For formwork and staging add the following:</b>				
		<b>For T-beam &amp; slab including launching of precast girders by launching truss upto 40 m span, 35-35 per cent of cost of concrete.</b>				
		<b>Height upto 5m</b>				
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				561,127.00
		<b>d) Formwork and staging 35 per cent of (a+b+c)</b>		35.00		196,394.45
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				151,504.29
		<b>f) Contractor's profit @ 15% on (a+b+c+d+e)</b>				136,353.86
		Cost for 120 cum = a+b+c+d+e+f				1,045,379.60
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				8,711.50
					<b>say</b>	<b>8,711.00</b>
<b>9.2</b>	<b>1600</b>	Supplying, fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications				



	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		<b>Unit = 1 MT</b>				
		<b>Taking output = 1 MT</b>				
		<b>a) Material</b>				
		HYSB bars including 5 per cent for laps and wastage	tonne	1.05	35700.00	37,485.00
		Binding wire	Kg	8.00	34.50	276.00
		<b>b) Labour for cutting, bending, tying and placing in position</b>				
		Mate	day	0.44	140.00	61.60
		Blacksmith	day	3.00	200.00	600.00
		Mazdoor	day	8.00	125.00	1,000.00
		<b>Basic Cost of Labour &amp; Material (a+b)</b>		<b>39423.00</b>		
		<b>c) Overhead charges @ 20% on (a+b)</b>				7,884.52
		<b>d) Contractor's profit @ 15% on (a+b+c)</b>				7,096.07
		<b>Rate per MT = a+b+c+d</b>				54,403.19
					<b>say</b>	<b>54,403.00</b>
<b>9.3</b>	<b>1800</b>	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications				
		<b>Unit = 1 MT</b>				
		<b>Taking output = 0.377 MT</b>				
		Details of cost for 12T13 strand 40 m long cable (weight = 0.377 MT)				
		<b>a) Material</b>				
		H.T. Strand @ 9.42 kg/m including 2 per cent for wastage and extra length for jacking	tonne	0.39	50000.00	19,250.00
		Sheathing duct ID 66 mm along with 5 per cent extra length 40 x 1.05 = 42 m.	metre	42.00	80.00	3,360.00
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	2.00	2450.00	4,900.00
		Cement for grouting including 3 per cent wastage @ 3.00 kg/m = 3 x 1.03 x 40 = 123.60 kg (say, = 125 kg)	tonne	0.125	4620.00	577.50
		Add 0.50 per cent cost of material for Spacers, Insulation tape and miscellaneous items				1,404.38
		<b>b) Labour</b>				
		<b>i) For making and fixing cables, anchorages</b>				
		Blacksmith	day	1.00	200.00	200.00
		Mazdoor	day	3.00	125.00	375.00
		<b>ii) For prestressing</b>				
		Mate/Supervisor	day	0.05	140.00	7.00
		Prestressing operator / Fitter	day	0.25	150.00	37.50
		Mazdoor	day	1.00	125.00	125.00
		<b>iii) For grouting</b>				
		Mate/Supervisor	day	0.05	140.00	7.00
		Mason	day	0.25	200.00	50.00
		Mazdoor	day	1.00	125.00	125.00
		<b>c) Machinery</b>				
		Stressing jack with pump	hour	2.50	123.00	307.50
		Grouting pump with agitator	hour	1.00	300.00	300.00
		Generator 33 KVA.	hour	3.50	355.00	1,242.50
		<b>d) Overhead charges @ 20% on (a+b+c)</b>				559.78
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				503.80
		Cost for 0.377 MT (a+b+c+d+e)				33,354.36
		<b>Rate per MT = (a+b+c+d+e)/0.377</b>				88,473.10
					<b>say</b>	<b>88,473.00</b>
<b>9.6</b>	<b>2705</b>	Drainage Spouts complete as per drawing and Technical specification				

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		<b>Unit = 1 No.</b>				
		<b>Taking output = 1 No.</b>				
		<b>a) Material</b>				
		Corrosion resistant Structural steel including 5 per cent wastage	Kg	4.00	56.00	224.00
		GI pipe 100mm dia	metre	6.00	50.00	300.00
		GI bolt 10 mm Dia	each	6.00	15.00	90.00
		Galvanised MS flat clamp	each	2.00	40.00	80.00
		<b>b) Labour</b>				
		<b>For fabrication</b>				
		Mate	day	0.02	140.00	2.80
		Skilled (Blacksmith, welder etc.)	day	0.02	200.00	4.00
		Mazdoor	day	0.02	125.00	2.50
		<b>For fixing in position</b>				
		Mate	day	0.01	140.00	1.40
		Mason	day	0.01	200.00	2.00
		Mazdoor	day	0.20	125.00	25.00
		Add @ 5 per cent of cost of material and labour for electrodes, cutting gas, sealant, anti-corrosive bituminous paint, mild steel grating etc.				36.59
		<b>c) Overhead charges @ 20% on (a+b)</b>				153.66
		<b>d) Contractor's profit @ 15% on (a+b+c)</b>				138.29
		<b>Rate per metre (a+b+c+d)</b>				1,060.23
					<b>say</b>	<b>1,060.00</b>
<b>9.7</b>	<b>2700</b>	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification				
		<b>Unit = 1 cum</b>				
		<b>Taking output = 1 cum</b>				
		<b>Material</b>				
		Concrete, Rate as per item No. 12.8 (A) excluding formworks	cum	1.00	4775.00	4,775.00
		<b>Rate per cum</b>			<b>say</b>	<b>4,775.00</b>
<b>9.8</b>	<b>1500,1600,1700 &amp; 2704</b>	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification				
		<b>Unit = 1 cum</b>				
		<b>Taking output = 1 cum</b>				
		<b>a) Material</b>				
		Cement concrete M30 Grade Refer relevant item of concrete in item 12.8(G) by using batching plant, excluding formwork i.e. per cum basic cost (a+b+c) (Excluding OH & CP)	cum	1.00	4236.00	4,236.00
		( Refer relevant item of concrete in item No. 13.8 (G) except that form work may be added at the rate of 2 per cent of cost against 3.5 per cent provided in the foundation concrete.				84.72
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.05	39427.00	1,971.35
		<b>b) Overhead charges @ 20% on (a)</b>				1,258.41
		<b>c) Contractor's profit @ 15% on(a+b)</b>				1,132.57
		<b>Rate per cum (a+b+c)</b>				8,683.06
					<b>say</b>	<b>8,683.00</b>
<b>9.10</b>	<b>2607</b>	<b>Strip Seal Expansion Joint</b>				

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		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 authorised representative ensuring compliance to the manufacturer's instructions for installation.				
		<b>Unit = Running meter</b>				
		<b>Taking output = 12 m</b>				
		<b>a) Labour</b>				
		Mate	day	0.05	140.00	7.00
		Mazdoor	day	1.00	125.00	125.00
		Mazdoor (Skilled)	day	0.25	140.00	35.00
		<b>b) Material</b>				
		Supply of complete assembly of strip seal expansion joint comprising of edge beams, anchorage, strip seal element and complete accessories as per approved specifications and drawings.	metre	12.00	20000.00	240,000.00
		Add 5 per cent of cost of material for anchorage reinforcement, welding and other incidentals.				12,008.35
		<b>c) Overhead charges @ 20% on (a+b)</b>				50,435.07
		Cost for 12 m = (a+b+c+d)				348,001.98
		<b>Rate per m = (a+b+c+d)/12</b>				29,000.00
9.11	2000 & 2200	<b>Supplying, fitting and fixing in position true to line and level POT-PTFE bearing consisting of a metal piston supported by a disc or unreinforced elastomer confined within a metal cylinder, sealing rings, dust seals, PTFE surface sliding against stainless steel mating surface, complete assembly to be of cast steel/fabricated structural steel, metal and elastomer elements to be as per IRC: 83 part-I &amp; II respectively and other parts conforming to BS: 5400, section 9.1 &amp; 9.2 and clause 2006 of MoRTH Specifications complete as per drawing and approved Technical Specifications.</b>				
		Unit: one tonne capacity				
		Considering a Pot bearing assembly of 626.707 tonne capacity for this analysis.				
		<b>a) Labour</b>				
		Mate	day	0.08	140.00	11.20
		Mazdoor	day	1.50	125.00	187.50
		Mazdoor (Skilled)	day	0.50	140.00	70.00
		<b>b) Material</b>				
		Pot type bearing assembly consisting of a metal piston supported by a disc, PTFE pads providing sliding surfaces against stainless steel mating together with cast steel assemblies/fabricated structural steel assemblies duly painted with all components as per clause 2006 and complete as per drawings and Technical Specifications.	each.	1.00	92792.00	92792.00
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.				927.92
		<b>c) Overhead charges @ 20% on (a+b)</b>				18,797.72
		<b>d) Contractor's profit @ 15% on (a+b+c)</b>				16,917.95
		cost for 250 tonnes capacity bearing = a+b+c+d				129704.30
		<b>Rate per tonne capacity = (a+b+c+d)/626.707</b>				206.96
					<b>say</b>	<b>207.00</b>
10.4	307	<b>Grassing with ' Doobs' Grass</b>				

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		Grassing with 'Doobs' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed				
		<b>Unit = sqm</b>				
		<b>Taking output = 100 sqm</b>				
		<b>In rows 15 cm apart in either direction</b>				
		<b>a) Labour</b>				
		Mate	day	0.170	140.00	23.80
		Mazdoor for grassing	day	0.750	125.00	93.75
		Mazdoor for maintenance for 30 days	day	1.000	125.00	125.00
		<b>b) Machinery</b>				
		Water tanker 6 KL capacity	hour	0.500	100.00	50.00
		<b>c) Material</b>				
		Doob grass	kg	100.000	1.00	100.00
		<b>d) Overhead charges @ 15% on (a+b+c)</b>				58.88
		<b>e) Contractor's profit @ 15% on (a+b+c+d)</b>				67.71
		Cost for 100 sqm = a+b+c+d+e				519.15
		<b>Rate per sqm = (a+b+c+d+e)/100</b>				5.19
					say	<b>5.00</b>
10.12	408	<b>Cast in Situ Cement Concrete M 20 Kerb with Channel</b>				
		Construction of cement concrete kerb with channel with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M10 grade foundation 150 mm thick, kerb channel 300 mm wide, 50 mm thick in PCC M20 grade, sloped towards the kerb, kerb stone with channel laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408				
		<b>Using Concrete Mixer</b>				
		<b>Unit = Running metre</b>				
		<b>Taking output = 300 metre length</b>				
		<b>Cement Concrete</b>				
		Cement concrete of grade M20 = 17.48 cum				
		Cement concrete of grade M10 for base = 23.18 cum				
		<b>Total Concrete = 40.66 cum</b>				
		<b>Using Concrete Batching and Mixing Plant</b>				
		<b>Unit = Running metre</b>				
		<b>Taking output = 300 metre length</b>				
		<b>Cement Concrete</b>				
		Cement concrete of grade M20 = 17.48 cum				
		Cement concrete of grade M10 for base = 23.18 cum				
		<b>Total Concrete = 40.66 cum</b>				
		<b>a) Labour</b>				
		Mate	day	0.120	140.00	16.80
		Mason	day	1.000	200.00	200.00
		Mazdoor	day	2.000	125.00	250.00
		<b>b) Machinery</b>				
		Kerb casting machine @ 50 metres/hour for laying kerb and channel	hour	6.000	295.00	1770.00
		Concrete batching and mixing plant @ 15 cum/hr.	hour	2.700	1773.00	4787.10
		Water tanker 6 KL capacity	hour	6.000	100.00	600.00
		Tipper of 5.5 cum capacity	hour	6.000	3.00	18.00
		<b>c) Material</b>				
		Crushed stone aggregate 20 mm nominal size 60 per cent	cum	36.590	1235.00	45188.65
		Coarse sand 30 per cent	cum	18.300	1506.65	27571.70
		Cement 10 per cent	tonne	9.010	4620.00	41626.20
		Cost of water	KL	36.000	40.00	1440.00

	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs
		d) Overhead charges @ 15% on (a+b+c)				18520.27
		e) Contractor's profit @ 15% on (a+b+c+d)				21298.31
		Cost for 300 meter = a+b+c+d+e				163287.02
		Rate per metre = (a+b+c+d+e)/300				544.29
					say	<u>544.00</u>

<b>(A) Usage Rates of Plant and Machinery</b>						
<b>Sl. No.</b>	<b>Description of Machine</b>	<b>Activity</b>	<b>Output of Machine</b>	<b>Output</b>	<b>Unit</b>	<b>Rate</b>
1	Air Compressor	General Purpose	capacity in cfm	170/250	hour	304.00
2	Batching and Mixing Plant (a) 30 cum capacity	Concrete Mixing	cum/hour	20	hour	2,128.00
3	Batching and Mixing Plant (b) 15 - 20 cum capacity	Concrete Mixing	cum/hour	13	hour	1,773.00
4	Bitumen Pressure Distributor	Applying bitumen tack coat	sqm/hour	1750	hour	1,022.00
5	Bitumen Boiler oil fired	Bitumen Spraying	capacity in litre	1500	hour	189.00
6	Concrete Paver Finisher with 40 HP Motor	Paving of concrete surface	cum / hour	20	hour	2,733.00
7	Concrete Pump of 45 & 30 cum capacity	Pumping of concrete	cum / hour	33 / 22	hour	244.00
8	Concrete Bucket	For Pouring concrete	capacity in cum	1	hour	15.00
9	Concrete Mixer (a) 0.4/0.28 cum	Concrete Mixing	cum/hour	2.5	hour	222.00
10	Concrete Mixer (b) 1 cum	Concrete Mixing	cum/hour	7.5	hour	222.00
11	Crane (a) 80 tonnes	Lifting Purpose			hour	1,219.00
12	Cranes b) 35 tonnes	Lifting Purpose			hour	813.00
13	Cranes c) 3 tonnes	Lifting Purpose			hour	340.00
14	Dozer D - 80 - A 12	Spreading /Cutting / Clearing	cum/hour	300/ 150/250	hour	3,546.00
15	Dozer D - 50 - A 15	Spreading /Cutting / Clearing	cum/hour	200/ 120/150	hour	2,102.00
16	Emulsion Pressure Distributor	Applying emulsion tack coat	sqm/hour	1750	hour	762.00
17	Front End loader 1 cum bucket capacity	Soil loading / Aggregate loading	cum/hour	60 /25	hour	768.00
18	Generator (a) 125 KVA	Generation of electric Energy	KVA	100	hour	665.00
19	Generator( b) 63 KVA	Generation of electric Energy	KVA	50	hour	355.00
20	GSB Plant 50 cum	Producing GSB	cum/hour	40	hour	990.00
21	Hotmix Plant - 120 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	40	hour	22,310.00
22	Hotmix Plant - 100 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	30	hour	16,499.00
23	Hotmix Plant - 60 to 90 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	25	hour	13,194.00
24	Hotmix Plant - 40 to 60 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	17	hour	10,564.00
25	Hydraulic Chip Spreader	Surface Dressing	sqm/hour	1500	hour	2,512.00
26	Hydraulic Excavator of 1 cum bucket	Soil Ordinary/Soil Marshy / Soil Unsuitable	cum/hour	60 /60 /60	hour	1,241.00
27	Integrated Stone Crusher 100THP	Crushing of Spalls	TPH	100	hour	8,259.00
28	Integrated Stone Crusher 200 HP	Crushing of Spalls	TPH	200	hour	17,375.00
29	Kerb Casting Machine	Kerb Making	Rm/hour	80	hour	295.00
30	Mastic Cooker	Mastic Wearing coat	capacity in tonne	1	hour	59.00
31	Mechanical Broom Hydraulic	Surface Cleaning	sqm/hour	1250	hour	340.00
32	Motor Grader 3.35 mtr blade	Clearing /Spreading /GSB /WBM	cum/hour	200/200/50/50	hour	2,283.00
33	Mobile slurry seal equipment	Mixing and laying slurry seal	sqm/hour	2700	hour	960.00
34	Paver Finisher Hydrostatic with sensor control 100 TPH	Paving of DBM/ BM/SDC/ Premix	cum/hour	40	hour	2,549.00
35	Paver Finisher Mechanical 100 TPH	Paving of WMM /Paving of DLC	cum/hour	40/30	hour	929.00

<b>(A) Usage Rates of Plant and Machinery</b>						
<b>Sl. No.</b>	<b>Description of Machine</b>	<b>Activity</b>	<b>Output of Machine</b>	<b>Output</b>	<b>Unit</b>	<b>Rate</b>
36	Piling Rig with Bantonite Pump	0.75 m dia to 1.2 m dia Boring attachment	Rm/hour	2 to 3	hour	5,208.00
37	Pneumatic Road Roller	Rolling of Asphalt Surface	cum/hour	25	hour	1,185.00
38	Pneumatic Sinking Plant	Pneumatic Sinking of wells	cum/hour	1.5 to 2.00	hour	3,974.00
39	Pot Hole Repair Machine	Repair of potholes	cum/hour	4	hour	864.00
40	Prestressing Jack with Pump & access	Stressing of steel wires/stands			hour	123.00
41	Ripper	Scarifying	cum/hour	60	hour	27.00
42	Rotavator	Scarifying	cum/hour	25	hour	16.00
43	Road marking machine	Road marking	Sqm/hour	100	hour	89.00
44	Smooth Wheeled Roller 8 tonne	Soil Compaction /BM Compaction	cum/hour	70/25	hour	439.00
45	Tandem Road Roller	Rolling of Aspalt Surface	cum/hour	30	hour	1,090.00
46	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	km	23.00
47	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	tonne.km	3.00
48	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	hour	295.00
49	Transit Mixer 4.0/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	hour	886.00
50	Transit Mixer 4/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	tonne.km	2.35
51	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	hour	813.00
52	Tractor	Pulling	capacity in HP	50	hour	346.00
53	Tractor with Rotevator	Rate of Tractor + Rotevator			hour	344.48
54	Tractor with Ripper	Rate of Tractor 6+ Ripper			hour	354.33
55	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	km	21.00
56	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	tonne.km	2.00
57	Vibratory Roller 8 tonne	Earth or soil / GSB / WBM	cum/hour	100/60/60	hour	1,469.00
58	Water Tanker	Water Transport	capacity in KL	5	hour	100.00
59	Water Tanker	Water Transport	capacity in KL	6	km	23.00
<b>Sl. No.</b>	<b>Description of Machine</b>				<b>Unit</b>	<b>Rate</b>
60	Air compressor with pneumatic chisel attachment for cutting hard clay.				hour	304
61	Cement concrete batch mix plant @ 175 cum per hour (effective output)				hour	7,200.00
62	Cement concrete batch mix plant @ 75 cum per hour				hour	2,880.00
63	Generator 33 KVA				hour	355.00
64	Generator 100 KVA				hour	665.00
65	Generator 250 KVA				hour	1,350.00
66	Joint Cutting Machine with 2-3 blades (for rigid pavement)				hour	1,423.00
67	Plate compactor				hour	32.00
68	Texturing machine (for rigid pavement)				hour	1,770.00
69	Wet Mix Plant 75 TPH				hour	1,148.00
70	Crane with grab 0.75 cum capacity				hour	240.00

<b>(B) Labour</b>			
<b>Sl. No.</b>	<b>Description of Labour</b>	<b>Unit</b>	<b>Rate</b>
1	Blacksmith (IInd class)	day	190.00
2	Blacksmith (Ist class)/ Welder/ Plumber/ Electrician	day	200.00
3	Blaster (Stone cutter)	day	140.00
4	Carpenter I Class	day	200.00
5	Chiseller (Head Mazdoor)	day	140.00
6	Driller (Jumper)	day	125.00
7	Diver	day	140.00
8	Fitter	day	150.00
9	Mali	day	125.00
10	Mason (IInd class)	day	190.00
11	Mason (Ist class)	day	200.00
12	Mate / Supervisor (Bituminous Work Labour)	day	140.00
13	Mazdoor (Bituminous Work Labour)	day	125.00
14	Mazdoor/Dresser (Semi Skilled) (Bituminous Work Labour)	day	135.00
15	Mazdoor/Dresser/Sinker (Skilled) (Bituminous Work Labour)	day	140.00
16	Mate / Supervisor	day	140.00
17	Mazdoor	day	125.00
18	Mazdoor/Dresser (Semi Skilled)	day	135.00
19	Mazdoor/Dresser/Sinker (Skilled)	day	140.00
20	Painter I class	day	200.00
21	Plumber I class	day	200.00
22	Electrician Grade I	day	200.00



<b>(C) Materials</b>				
<b>Sl. No.</b>	<b>Description</b>	<b>Unit</b>	<b>Rate</b>	
3	Boulder with minimum size of 300 mm for Pitching at Site	cum	1,159.70	
4	Coarse sand at Mixing Plant	cum	1,506.65	
5	Coarse sand at Site	cum	1,506.65	
6	Fine sand at Site	cum	483.25	
7	Gravel/Quarry spall at Site	Cum	924.70	
8	Filter media/Filter Material as per Table 300-3 (MoRT&H Specification)	Cum	1,149.03	
	<b>Description</b>	<b>Unit</b>	<b>Rate at Plant (HMP/Batching)</b>	<b>Rate at Site</b>
9	Close graded Granular sub-base Material 53 mm to 9.5 mm	cum	1,151.10	1,151.10
10	Close graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	1,151.10	1,151.10
11	Close graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	1,151.10	1,151.10
12	Close graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	1,151.10	1,151.10
13	Close graded Granular sub-base Material 9.5 mm to 2.36 mm	cum	1,151.10	1,151.10
14	Close graded Granular sub-base Material 4.75mm to 2.36 mm	cum	1,217.90	1,217.90
15	Close graded Granular sub-base Material 4.75mm to 75 micron		1,217.90	1,217.90
16	Close graded Granular sub-base Material 2.36 mm	cum	1,217.90	1,217.90
17	Stone crusher dust finer than 3mm with not more than 10% passing 0.075 sieve.	cum	1,166.70	1,166.70
18	Coarse graded Granular sub-base Material 2.36 mm & below	cum	1,217.90	1,217.90
19	Coarse graded Granular sub-base Material 4.75mm to 75 micron		1,217.90	1,217.90
20	Coarse graded Granular sub-base Material 4.75 mm to 2.36 mm	cum	1,217.90	1,217.90
21	Coarse graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	1,151.10	1,151.10
22	Coarse graded Granular sub-base Material 26.5 mm to 4.75 mm	cum	1,151.10	1,151.10
23	Coarse graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	1,151.10	1,151.10
24	Coarse graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	1,151.10	1,151.10
25	Coarse graded Granular sub-base Material 53 mm to 26.5mm	cum	1,151.10	1,151.10
26	Aggregates below 5.6 mm	cum	1,217.90	1,217.90
27	Aggregates 22.4 mm to 2.36 mm	cum	1,235.00	1,235.00
28	Aggregates 22.4 mm to 5.6 mm	cum	1,235.00	1,235.00
29	Aggregates 45 mm to 2.8 mm	cum	1,235.00	1,235.00
30	Aggregates 45 mm to 22.4 mm	cum	1,184.90	1,184.90
31	Aggregates 53 mm to 2.8 mm	cum	1,184.90	1,184.90
32	Aggregates 53 mm to 22.4 mm	cum	1,184.90	1,184.90
33	Aggregates 63 mm to 2.8 mm	cum	1,157.40	1,157.40
34	Aggregates 63 mm to 45 mm	cum	1,157.40	1,157.40
35	Aggregates 90 mm to 45 mm	cum	1,135.30	1,135.30
36	Aggregates 10 mm to 5 mm	cum	1,235.00	1,235.00

(C) Materials				
	Description	Unit	Rate at Plant (HMP/Batching)	Rate at Site
37	Aggregates 11.2 mm to 0.09 mm	cum	1,235.00	1,235.00
38	Aggregates 13.2 mm to 0.09 mm	cum	1,235.00	1,235.00
39	Aggregates 13.2 mm to 5.6 mm	cum	1,235.00	1,235.00
40	Aggregates 13.2 mm to 10 mm	cum	1,235.00	1,235.00
41	Aggregates 20 mm to 10 mm	cum	1,235.00	1,235.00
42	Aggregates 25 mm to 10 mm	cum	1,235.00	1,235.00
43	Aggregates 19 mm to 6 mm	cum	1,235.00	1,235.00
44	Aggregates 37.5 mm to 19 mm	cum	1,184.90	1,184.90
45	Aggregates 37.5 mm to 25 mm	cum	1,184.90	1,184.90
46	Aggregates 6 mm nominal size	cum	1,217.90	1,217.90
47	Aggregates 10 mm nominal size	cum	1,235.00	1,235.00
48	Aggregates 13.2/12.5 mm nominal size	cum	1,235.00	1,235.00
49	Aggregates 20 mm nominal size	cum	1,235.00	1,235.00
50	Aggregates 25 mm nominal size	cum	1,184.90	1,184.90
51	Aggregates 40 mm nominal size	cum	1,184.90	1,184.90
Sl. No.	Description	Unit	Rate	
52	AC pipe 100 mm dia	metre	50.00	
53	Aluminium sheeting fixed with encapsulated lens type reflective sheeting including 2% towards lettering, cost of angle iron, cost of drilling holes, nuts, bolts etc.and signs as applicable	sqm	3,689.00	
54	Aluminium studs 100 x 100 mm fitted with lense reflectors	nos	155.63	
55	Bearing (Elastomeric bearing assembly consisting of 7 internal layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanisation,)	nos	10,500.00	
52	Bearing (POT-PTFE consisting of metal piston supported by disc or unreinforced elastomer confined within a metal cylinder) for 614.8 T	nos	92,792.00	
56	Bentonite	kg	4.80	
57	Binding wire	kg	34.50	
58	Bitumen ( Cationic Emulsion )	tonne	22,157.57	
59	Bitumen (60-70 grade)	tonne	32,146.18	
62	Bitumen (emulsion)	tonne	33,045.40	
64	Brick	each	3.02	
65	Cement	tonne	4,620.00	
66	Cold twisted bars (HYSD Bars)	tonne	35,700.00	
67	Coller for joints 300 mm dia	nos	400.00	
68	Compressible Fibre Board(20mm thick)	sqm	30.00	
69	Copper Plate(12m long x 250mmwide)	kg	277.00	
70	Corrosion resistant Structural steel	tonne	56,000.00	
71	Curing compound	liter	200.00	
72	Delineators from ISI certified firm as per the standard drawing given in IRC - 79	each	425.00	
73	Earth Cost or compensation for earth taken from private land	cum	50.00	
74	Epoxy compound with accessories for preparing epoxy mortar	kg	450.00	

<b>(C) Materials</b>			
<b>Sl. No.</b>	<b>Description</b>	<b>Unit</b>	<b>Rate</b>
75	Epoxy primer	kg	200.00
76	Galvanised MS flat clamp	nos	40.00
77	GI bolt 10 mm Dia	nos	15.00
78	Grouting pump with agitator	hour	300.00
79	Grass (Doob)	kg	1.00
80	Grass (Fine)	kg	1.50
81	Hot applied thermoplastic compound	litre	55.00
82	HTS strand	tonne	50,000.00
83	Joint Sealant Compound	kg	350.00
84	M.S. Clamps	nos	40.00
85	M.S. Clamps	kg	34.50
86	M.S.shoes @ 35 Kg per pile of 15 m	kg	34.50
87	Mild Steel bars	tonne	34,500.00
88	Nuts and bolts	kg	34.50
89	Paint	litre	172.00
90	Pavement Marking Paint	litre	172.00
91	Pesticide	kg	315.00
92	Pipes 200 mm dia, 2.5 m long for drainage	metre	378.00
93	Plastic sheath, 1.25 mm thick for dowel bars	sqm	206.00
94	Pre moulded Joint filler,25 mm thick for expansion joint.	sqm	578.00
95	Pre-coated stone chips of 13.2 mm nominal size	cum	1,296.75
96	Pre-moulded asphalt filler board	sqm	25.00
97	RCC Pipe NP 4 heavy duty non presure pipe 900 mm dia	metre	3,500.00
98	RCC Pipe NP 4 heavy duty non presure pipe 1000 mm dia	metre	3,900.00
99	RCC Pipe NP 4 heavy duty non presure pipe 1200 mm dia	metre	4,500.00
100	RCC Pipe NP 4 heavy duty non presure pipe 300 mm dia	metre	1,200.00
101	Reflectorising glass beads	kg	45.00
103	Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	10.00
104	Sheathing duct	metre	80.00
105	Sludge / Farm yard manure @ 0.18 cum per 100 sqm at site of work for turfing	cum	350.00
106	Strip seal expansion joint	metre	20,000.00
107	Structural Steel	tonne	34,500.00
108	Super plastisizer admixture IS marked as per 9103-1999	kg	150.00
109	Synthetic Geogrids as per clause 3102.8 and approved design and specifications.	sqm	50.00
111	Tiles size 300 x 300 mm and 25 mm thick	each	5.00
112	Tube anchorage set complete with bearing plate, permanent wedges etc	nos	2,450.00
113	Unstaked lime	tonne	3,000.00
114	Water	KL	40.00

	Overheads for Road Works	15%					
	Contractors profit for Road Works	15%					
	Overheads for Bridge Works	20%					
	Overheads for Bridge Works (Rehabilitation)	30%					
	Contractors profit for Bridge Works	15%					
	Lead from Mixing Plant to working site		0.00 km				
	Lead for E/W borow area to site		0.00 km				

Items No.	Summary of Rates calculated and used for analysis of rates of other items	Unit	Rate
1	Printing new letter and figures of any shade (ii) English Roman	per cm height per letter	0.30
2	Painting Two Coats on New Concrete Surfaces	sqm	52.00
3	Painting angle iron post two coats	sqm	45.00
4	Cement mortar 1:2 (Excluding OH & CP)	cum	4,629.00
5	Cement mortar 1:3 (Excluding OH & CP)	cum	4,056.00
6	Cement mortar 1:6 (Excluding OH & CP)	cum	3,257.00
7	PCC Grade M15 including OH & CP for Open Foundation by Mixer	cum	4,966.00
8	PCC Grade M15 for Open Foundation Per Cum Basic Cost of Labour, Material & Mechinery by Mixer	cum	3,460.00
9	PCC Grade M20 for Open Foundation Per Cum Basic Cost of Labour, Material & Mechinery by Mixer	cum	3,787.00
10	RCC Grade M20 including OH & CP for Open Foundation by Batching Plant	cum	5,338.00
11	RCC Grade M20 for Open Foundation Per Cum Basic Cost of Labour, Material & Mechinery by Batching Plant	cum	3,720.00
12	PCC Grade M25 including OH & CP for Open Foundation by Batching Plant	cum	5,646.00
13	PCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Mechinery by Batching Plant	cum	3,944.00
14	RCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Mechinery by Batching Plant	cum	4,220.00
15	PCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Mechinery by Batching Plant	cum	3,969.00
16	RCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Mechinery by Batching Plant	cum	4,236.00
16	RCC Grade M50 for Open Foundation Per Cum Basic Cost of Labour, Material & Mechinery by Batching Plant	cum	4,674.00
17	RCC Grade M35 including OH & CP for Open Foundation by Batching Plant	cum	4,448.00
18	RCC Grade M35 excluding OH & CP for Open Foundation by Batching Plant	cum	6,138.00
19	RCC Grade M35 for Open Foundation Per Cum Basic Cost of Labour, Material & Mechinery by Batching Plant	cum	4,319.00
20	PCC Grade M30 excluding OH & CP	cum	3,969.00
21	Excavation for Structures (Manual Means)	cum	138.00
22	Excavation for Structures (Mechanical Meanse)	cum	37.00
23	RCC Grade M20 for super-structure including OH & CP by Batching Plant	cum	6,112.00
24	RCC Grade M30 for super-structure including formwork and excluding OH & CP by Batching Plant	cum	4,429.00
25	RCC Grade M30 for super-structure excluding formwork and excluding OH & CP by Batching Plant	cum	3,691.00
26	RCC Grade M20 for super-structure including OH & CP by Batching Plant	cum	6,564.00
27	RCC Grade M20 for super-structure excluding formwork and excluding OH & CP by Batching Plant	cum	3,964.00
28	RCC Grade M40 for super-structure including OH & CP by Batching Plant	cum	7,544.00
29	RCC Grade M30 for super-structure including formwork and excluding OH & CP by Batching Plant	cum	4,803.00
30	RCC Grade M30 for super-structure excluding formwork and excluding OH & CP by Batching Plant	cum	4,002.00
31	Supplying ,fitting and placing HYSD bar reinforcement in super-structure excluding OH & CP	tonne	39,427.00
32	Supplying, fitting and placing HYSD including OH & CP for sub-structure	tonne	53,758.00
33	PCC Grade M40 excluding OH & CP	cum	4,322.00

**Material Rates**

SI.No	Description	Unit	Cost at Quarry	Lead in Km	Lead charges in Rs	Cost at CMP
<b>COST AND CONVEYANCE OF MATERIALS AT CMP</b>						
1	Close graded Granular sub-base Material 53 mm to 9.5 mm	cum		198.00	827.70	1,151.10
2	Close graded Granular sub-base Material 37.5 mm to 9.5 mm	cum		198.00	827.70	1,151.10
3	Close graded Granular sub-base Material 26.5 mm to 9.5 mm	cum		198.00	827.70	1,151.10
4	Close graded Granular sub-base Material 9.5 mm to 4.75 mm	cum		198.00	827.70	1,151.10
5	Close graded Granular sub-base Material 9.5 mm to 2.36 mm	cum		198.00	827.70	1,151.10
6	Close graded Granular sub-base Material 4.75mm to 2.36 mm	cum		198.00	827.70	1,217.90
7	Close graded Granular sub-base Material 4.75mm to 75 micron mm	cum		198.00	827.70	1,217.90
8	Close graded Granular sub-base Material 2.36 mm	cum		198.00	827.70	1,217.90
9	Stone crusher dust finer than 3mm with not more than 10% passing 0.075 sieve.	cum		198.00	827.70	1,166.70
10	Coarse graded Granular sub-base Material 2.36 mm & below	cum		198.00	827.70	1,217.90
11	Coarse graded Granular sub-base Material 4.75mm to 75 micron mm	cum		198.00	827.70	1,217.90
12	Coarse graded Granular sub-base Material 4.75 mm to 2.36 mm	cum		198.00	827.70	1,217.90
13	Coarse graded Granular sub-base Material 9.5 mm to 4.75 mm	cum		198.00	827.70	1,151.10
14	Coarse graded Granular sub-base Material 26.5 mm to 4.75 mm	cum		198.00	827.70	1,151.10
15	Coarse graded Granular sub-base Material 26.5 mm to 9.5 mm	cum		198.00	827.70	1,151.10
16	Coarse graded Granular sub-base Material 37.5 mm to 9.5 mm	cum		198.00	827.70	1,151.10
17	Coarse graded Granular sub-base Material 53 mm to 26.5mm	cum		198.00	827.70	1,151.10
18	Aggregates below 5.6 mm	cum		198.00	827.70	1,217.90
19	Aggregates 22.4 mm to 2.36 mm	cum		198.00	827.70	1,235.00
20	Aggregates 22.4 mm to 5.6 mm	cum		198.00	827.70	1,235.00
21	Aggregates 45 mm to 2.8 mm	cum		198.00	827.70	1,235.00
22	Aggregates 45 mm to 22.4 mm	cum		198.00	827.70	1,184.90
23	Aggregates 53 mm to 2.8 mm	cum		198.00	827.70	1,184.90
24	Aggregates 53 mm to 22.4 mm	cum		198.00	827.70	1,184.90
25	Aggregates 63 mm to 2.8 mm	cum		198.00	827.70	1,157.40
26	Aggregates 63 mm to 45 mm	cum		198.00	827.70	1,157.40
27	Aggregates 90 mm to 45 mm	cum		198.00	827.70	1,135.30
28	Aggregates 10 mm to 5 mm	cum		198.00	827.70	1,235.00
29	Aggregates 11.2 mm to 0.09 mm	cum		198.00	827.70	1,235.00
30	Aggregates 13.2 mm to 0.09 mm	cum		198.00	827.70	1,235.00
31	Aggregates 13.2 mm to 5.6 mm	cum		198.00	827.70	1,235.00
32	Aggregates 13.2 mm to 10 mm	cum		198.00	827.70	1,235.00
33	Aggregates 20 mm to 10 mm	cum		198.00	827.70	1,235.00
34	Aggregates 25 mm to 10 mm	cum		198.00	827.70	1,235.00
35	Aggregates 19 mm to 6 mm	cum		198.00	827.70	1,235.00
36	Aggregates 37.5 mm to 19 mm	cum		198.00	827.70	1,184.90
37	Aggregates 37.5 mm to 25 mm	cum		198.00	827.70	1,184.90
38	Aggregates 6 mm nominal size	cum		198.00	827.70	1,217.90
39	Aggregates 10 mm nominal size	cum		198.00	827.70	1,235.00
40	Aggregates 13.2/12.5 mm nominal size	cum		198.00	827.70	1,235.00
41	Aggregates 20 mm nominal size	cum		198.00	827.70	1,235.00
42	Aggregates 25 mm nominal size	cum		198.00	827.70	1,184.90
43	Aggregates 40 mm nominal size	cum		198.00	827.70	1,184.90
44	Sand for Mortar	cum	1,000.00	170.00	506.65	1,506.65

**Material Rates**

Sl.No	Description	Unit	Cost at Quarry	Lead in Km	Lead charges in Rs	Cost at SITE
<b>COST AND CONVEYANCE OF MATERIALS AT SITE</b>						
1	Close graded Granular sub-base Material 53 mm to 9.5 mm	cum	-	198.00	827.70	1,151.10
2	Close graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	-	198.00	827.70	1,151.10
3	Close graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	-	198.00	827.70	1,151.10
4	Close graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	-	198.00	827.70	1,151.10
5	Close graded Granular sub-base Material 9.5 mm to 2.36 mm	cum	-	198.00	827.70	1,151.10
6	Close graded Granular sub-base Material 4.75mm to 2.36 mm	cum	-	198.00	827.70	1,217.90
7	Close graded Granular sub-base Material 4.75mm to 75 micron mm	cum	-	198.00	827.70	1,217.90
8	Close graded Granular sub-base Material 2.36 mm	cum	-	198.00	827.70	1,217.90
9	Stone crusher dust finer than 3mm with not more than 10% passing 0.075 sieve.	cum	-	198.00	827.70	1,166.70
10	Coarse graded Granular sub-base Material 2.36 mm & below	cum	-	198.00	827.70	1,217.90
11	Coarse graded Granular sub-base Material 4.75mm to 75 micron mm	cum	-	198.00	827.70	1,217.90
12	Coarse graded Granular sub-base Material 4.75 mm to 2.36 mm	cum	-	198.00	827.70	1,217.90
13	Coarse graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	-	198.00	827.70	1,151.10
14	Coarse graded Granular sub-base Material 26.5 mm to 4.75 mm	cum	-	198.00	827.70	1,151.10
15	Coarse graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	-	198.00	827.70	1,151.10
16	Coarse graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	-	198.00	827.70	1,151.10
17	Coarse graded Granular sub-base Material 53 mm to 26.5mm	cum	-	198.00	827.70	1,151.10
18	Aggregates below 5.6 mm	cum	-	198.00	827.70	1,217.90
19	Aggregates 22.4 mm to 2.36 mm	cum	-	198.00	827.70	1,235.00
20	Aggregates 22.4 mm to 5.6 mm	cum	-	198.00	827.70	1,235.00
21	Aggregates 45 mm to 2.8 mm	cum	-	198.00	827.70	1,235.00
22	Aggregates 45 mm to 22.4 mm	cum	-	198.00	827.70	1,184.90
23	Aggregates 53 mm to 2.8 mm	cum	-	198.00	827.70	1,184.90
24	Aggregates 53 mm to 22.4 mm	cum	-	198.00	827.70	1,184.90
25	Aggregates 63 mm to 2.8 mm	cum	-	198.00	827.70	1,157.40
26	Aggregates 63 mm to 45 mm	cum	-	198.00	827.70	1,157.40
27	Aggregates 90 mm to 45 mm	cum	-	198.00	827.70	1,135.30
28	Aggregates 10 mm to 5 mm	cum	-	198.00	827.70	1,235.00
29	Aggregates 11.2 mm to 0.09 mm	cum	-	198.00	827.70	1,235.00
30	Aggregates 13.2 mm to 0.09 mm	cum	-	198.00	827.70	1,235.00
31	Aggregates 13.2 mm to 5.6 mm	cum	-	198.00	827.70	1,235.00
32	Aggregates 13.2 mm to 10 mm	cum	-	198.00	827.70	1,235.00
33	Aggregates 20 mm to 10 mm	cum	-	198.00	827.70	1,235.00
34	Aggregates 25 mm to 10 mm	cum	-	198.00	827.70	1,235.00
35	Aggregates 19 mm to 6 mm	cum	-	198.00	827.70	1,235.00
36	Aggregates 37.5 mm to 19 mm	cum	-	198.00	827.70	1,184.90
37	Aggregates 37.5 mm to 25 mm	cum	-	198.00	827.70	1,184.90
38	Aggregates 6 mm nominal size	cum	-	198.00	827.70	1,217.90
39	Aggregates 10 mm nominal size	cum	-	198.00	827.70	1,235.00
40	Aggregates 13.2/12.5 mm nominal size	cum	-	198.00	827.70	1,235.00
41	Aggregates 20 mm nominal size	cum	-	198.00	827.70	1,235.00
42	Aggregates 25 mm nominal size	cum	-	198.00	827.70	1,184.90
43	Aggregates 40 mm nominal size	cum	-	198.00	827.70	1,184.90
44	Sand for Mortar	cum	1,000.00	170.00	506.65	1,506.65
45	Sand for filling	cum	320.00	30.00	163.25	483.25
46	Stone Spalls	cum	97.00	198.00	827.70	924.70
47	Random Rubble Stone	cum	332.00	198.00	827.70	1,159.70
48	Filter Material	cum	321.33	198.00	827.70	1,149.03