

This software is based on Standard Data book for analysis of Rates for Road and Bridge Works

This Software runs on Microsoft Excel

INPUT- Input the usage rates of Plant & Machinery, labour and material as applicable

SUMMARY - In this sheet summary of all the rates analyzed is presented

ANALYSIS- The analysis has been presented in 16 nos. of spread sheets

Worksheet- 1 : CHAPTER-1 CARRIAGE OF MATERIALS

Worksheet- 2 : CHAPTER-2 SITE CLEARANCE

Worksheet- 3 : CHAPTER-3 EARTH WORK, EROSION CONTROL AND DRAINAGE

Worksheet- 4 : CHAPTER-4 SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Worksheet- 5 : CHAPTER-5 BASES AND SURFACE COURSES (BITUMINOUS)

Worksheet- 6 : CHAPTER-6 CEMENT CONCRETE PAVEMENTS

Worksheet- 7 : CHAPTER-7 GEOSYNTHETICS AND REINFORCED EARTH

Worksheet- 8 : CHAPTER-8 TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Worksheet- 9 : CHAPTER-9 PIPE CULVERTS

Worksheet- 10 : CHAPTER-10 MAINTENANCE OF ROADS

Worksheet- 11 : CHAPTER-11 HORTICULTURE

Worksheet- 12 : CHAPTER-12 FOUNDATIONS

Worksheet- 13 : CHAPTER-13 SUB-STRUCTURE

Worksheet- 14 : CHAPTER-14 SUPER-STRUCTURE

Worksheet- 15 : CHAPTER-15 RIVER TRAINING AND PROTECTION WORKS

Worksheet- 16 : CHAPTER-16 REPAIR AND REHABILITATION

(A) Usage Rates of Plant and Machinery						
Sl. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Phek 2018
P&M-001	Air Compressor	General Purpose	capacity in cfm	170/250	hour	888
P&M-002	Batching and Mixing Plant (a) 30 cum capacity	Concrete Mixing	cum/hour	20	hour	2196
P&M-003	Batching and Mixing Plant (b) 15 - 20 cum capacity	Concrete Mixing	cum/hour	13	hour	1806
P&M-004	Bitumen Pressure Distributor	Applying bitumen tack coat	sqm/hour	1750	hour	1041
P&M-005	Bitumen Boiler oil fired	Bitumen Spraying	capacity in litre	1500	hour	318
P&M-006	Concrete Paver Finisher with 40 HP Motor	Paving of concrete surface	cum / hour	20	hour	3006
P&M-007	Concrete Pump of 45 & 30 cum capacity	Pumping of concrete	cum / hour	33 / 22	hour	410
P&M-008	Concrete Bucket	For Pouring concrete	capacity in cum	1	hour	16
P&M-009	Concrete Mixer (a) 0.4/0.28 cum	Concrete Mixing	cum/hour	2.5	hour	376
P&M-010	Concrete Mixer (b) 1 cum	Concrete Mixing	cum/hour	7.5	hour	602
P&M-011	Crane (a) 80 tonnes	Lifting Purpose			hour	1773
P&M-012	Cranes b) 35 tonnes	Lifting Purpose			hour	1182
P&M-013	Cranes c) 3 tonnes	Lifting Purpose			hour	788
P&M-014	Dozer D - 80 - A 12	Spreading /Cutting / Clearing	cum/hour	300/ 150/250	hour	3057
P&M-015	Dozer D - 50 - A 15	Spreading /Cutting / Clearing	cum/hour	200/ 120/150	hour	1722
P&M-016	Emulsion Pressure Distributor	Applying emulsion tack coat	sqm/hour	1750	hour	903
P&M-017	Front End loader 1 cum bucket capacity	Soil loading / Aggregate loading	cum/hour	60 /25	hour	931
P&M-018	Generator (a) 125 KVA	Generation of electric Energy	KVA	100	hour	710
P&M-019	Generator(b) 63 KVA	Generation of electric Energy	KVA	50	hour	379
P&M-020	GSB Plant 50 cum	Producing GSB	cum/hour	40	hour	1056
P&M-021	Hotmix Plant - 120 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	40	hour	18085
P&M-022	Hotmix Plant - 100 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	30	hour	15726
P&M-023	Hotmix Plant - 60 to 90 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	25	hour	14468
P&M-024	Hotmix Plant - 40 to 60 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	17	hour	13021
P&M-025	Hydraulic Chip Spreader	Surface Dressing	sqm/hour	1500	hour	2558
P&M-026	Hydraulic Excavator of 1 cum bucket	Soil Ordinary/Soil Marshy / Soil Unsuitable	cum/hour	60 /60 /60	hour	1445
P&M-027	Integrated Stone Crusher 100TPH	Crushing of Spalls	TPH	100	hour	8411
P&M-028	Integrated Stone Crusher 200 HP	Crushing of Spalls	TPH	200	hour	16852
P&M-029	Kerb Casting Machine	Kerb Making	Rm/hour	80	hour	302
P&M-030	Mastic Cooker	Mastic Wearing coat	capacity in tonne	1	hour	537
P&M-031	Mechanical Broom Hydraulic	Surface Cleaning	sqm/hour	1250	hour	540
P&M-032	Motor Grader 3.35 mtr blade	Clearing /Spreading /GSB /WBM	cum/hour	200/200/50/50	hour	2325
P&M-033	Mobile slurry seal equipment	Mixing and laying slurry seal	sqm/hour	2700	hour	941
P&M-034	Paver Finisher Hydrostatic with sensor control 100 TPH	Paving of DBM/ BM/SDC/ Premix	cum/hour	40	hour	2719
P&M-035	Paver Finisher Mechanical 100 TPH	Paving of WMM /Paving of DLC	cum/hour	40/30	hour	1261
P&M-036	Piling Rig with Bantonite Pump	0.75 m dia to 1.2 m dia Boring attachment	Rm/hour	2 to 3	hour	5303
P&M-037	Pneumatic Road Roller	Rolling of Asphalt Surface	cum/hour	25	hour	1262
P&M-038	Pneumatic Sinking Plant	Pneumatic Sinking of wells	cum/hour	1.5 to 2.00	hour	4048
P&M-039	Pot Hole Repair Machine	Repair of potholes	cum/hour	4	hour	880
P&M-040	Prestressing Jack with Pump & access	Stressing of steel wires/stands			hour	131
P&M-041	Ripper	Scarifying	cum/hour	60	hour	40
P&M-042	Rotavator	Scarifying	cum/hour	25	hour	42
P&M-043	Road marking machine	Road marking	Sqm/hour	100	hour	129
P&M-044	Smooth Wheeled Roller 8 tonne	Soil Compaction /BM Compaction	cum/hour	70/25	hour	511
P&M-045	Tandem Road Roller	Rolling of Asphalt Surface	cum/hour	30	hour	762
P&M-046	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	km	184
P&M-047	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	tonne.km	9
P&M-048	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	hour	1006

P&M-049	Transit Mixer 4.0/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	hour	165
P&M-050	Transit Mixer 4/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	tonne.km	38
P&M-051	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	hour	89
P&M-052	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	tonne.km	28
P&M-053	Tractor	Pulling	capacity in HP	50	hour	358
P&M-054	Tractor with Rotevator	Rate of Tractor + Rotevator			hour	386
P&M-055	Tractor with Ripper	Rate of Tractor 6+ Ripper			hour	396
P&M-056	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	km	144
P&M-057	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	hour	1006
P&M-058	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	tonne.km	9
P&M-059	Vibratory Roller 8 tonne	Earth or soil / GSB / WBM	cum/hour	100/60/60	hour	834
P&M-060	Water Tanker	Water Transport	capacity in KL	6	hour	820
P&M-061	Water Tanker	Water Transport	capacity in KL	6	km	144
P&M-062	Wet Mix Plant 60 TPH	Wet Mix	cum/hour	25	hour	1224
Sl. No.	Description of Machine				Unit	
P&M-063	Air compressor with pneumatic chisel attachment for cutting hard clay.				hour	288
P&M-064	Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour				hour	3762
P&M-065	Belt conveyor system				hour	626
P&M-066	Boat to carry atleast 20 persons				hour	358
P&M-067	Cement concrete batch mix plant @ 175 cum per hour (effective output)				hour	3762
P&M-068	Cement concrete batch mix plant @ 75 cum per hour				hour	2759
P&M-069	Cold milling machine @ 20 cum per hour				hour	2258
P&M-070	Crane 5 tonne capacity				hour	510
P&M-071	Crane 10 tonne capacity				hour	598
P&M-072	Crane 15 tonne capacity				hour	662
P&M-073	Crane 20 tonne capacity				hour	786
P&M-074	Crane 40 T capacity				hour	912
P&M-075	Crane with grab 0.75 cum capacity				hour	628
P&M-076	Compressor with guniting equipment along with accessories				hour	1254
P&M-077	Drum mix plant for cold mixes of appropriate capacity but not less than 75 tonnes/hour.				hour	652
P&M-078	Epoxy Injection gun				hour	287
P&M-079	Generator 33 KVA				hour	1076
P&M-080	Generator 100 KVA				hour	1253
P&M-081	Generator 250 KVA				hour	1433
P&M-082	Induction, deinduction and erection of plant and equipment including all components and accessories for pneumatic method of well sinking.				hour	3694
P&M-083	Joint Cutting Machine with 2-3 blades (for rigid pavement)				hour	448
P&M-084	Jack for Lifting 40 tonne lifting capacity.				day	957
P&M-085	Piling rig Including double acting pile driving hammer (Hydraulic rig)				hrs	188
P&M-086	Plate compactor				hour	188
P&M-087	Snow blower equipment 140 HP @ 600 cum per hour				hour	753
P&M-088	Texturing machine (for rigid pavement)				hour	1493
P&M-089	Truck Trailor 30 tonne capacity				hour	1835
P&M-090	Truck Trailor 30 tonne capacity				t.km	175
P&M-091	Tunnel Boring machine				hour	14330
P&M-092	Vibrating Pile driving hammer complete with power unit and accessories.				hour	1051
P&M-093	Wet Mix Plant 100 TPH				hour	2019
P&M-094	Wet Mix Plant 75 TPH				hour	1398

(B) Labour			
Sl. No.	Description of Labour	Unit	
L-01	Blacksmith (IInd class)	day	583
L-02	Blacksmith (Ist class)/ Welder/ Plumber/ Electrician	day	635
L-03	Blaster (Stone cutter)	day	635
L-04	Carpenter I Class	day	635
L-05	Chiseller (Head Mazdoor)	day	635
L-06	Driller (Jumper)	day	635
L-07	Diver	day	794
L-08	Fitter	day	635
L-09	Mali	day	477
L-10	Mason (IInd class)	day	530
L-11	Mason (Ist class)	day	635
L-12	Mate / Supervisor	day	583
L-13	Mazdoor	day	530
L-14	Mazdoor/Dresser (Semi Skilled)	day	583
L-15	Mazdoor/Dresser/Sinker (Skilled)	day	688
L-16	Medical Officer	day	1165
L-17	Operator(grouting)	day	635
L-18	Painter I class	day	635
L-19	Para medical personnel	day	900
(C) Materials			
Sl. No.	Description	Unit	
M-001	Stone Boulder of size 150 mm and below at Crusher Plant	cum	1139
M-002	Supply of quarried stone 150 - 200 mm size for Hand Broken at site	cum	1082
M-003	Boulder with minimum size of 300 mm for Pitching at Site	cum	1297
M-004	Coarse sand at Mixing Plant	cum	6978
M-005	Coarse sand at Site	cum	7753
M-006	Fine sand at Site	cum	6624
M-007	Moorum at Site	cum	1379
M-008	Gravel/Quarry spall at Site	Cum	2947
M-009	Granular Material or hard murrum for GSB works at Site	Cum	1517
M-010	Granular Material or hard murrum for GSB works at Mixing Plant	Cum	1655

M-011	Fly ash conforming to IS: 3812 (Part II & I) atHMP Plant / Batching Plant / Crushing Plant	Cum	12281	
M-012	Filter media/Filter Material as per Table 300-3 (MoRT&H Specification)	Cum	1919	
	Description	Unit	Rate at Plant (HMP/Batching)	
M-013	Close graded Granular sub-base Material 53 mm to 9.5 mm	cum	1928	1753
M-014	Close graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	1951	1774
M-015	Close graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	1993	1812
M-016	Close graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	2023	1839
M-017	Close graded Granular sub-base Material 9.5 mm to 2.36 mm	cum	2028	1844
M-018	Close graded Granular sub-base Material 4.75mm to 2.36 mm	cum	2034	1849
M-019	Close graded Granular sub-base Material 4.75mm to 75 micron mm		2038	1852
M-020	Close graded Granular sub-base Material 2.36 mm	cum	2040	1855
M-021	Stone crusher dust finer than 3mm with not more than 10% passing 0.075 sieve.	cum	1517	1379
M-022	Coarse graded Granular sub-base Material 2.36 mm & below	cum	2042	1857
M-023	Coarse graded Granular sub-base Material 4.75mm to 75 micron mm		2037	1851
M-024	Coarse graded Granular sub-base Material 4.75 mm to 2.36 mm	cum	2031	1846
M-025	Coarse graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	2013	1830
M-026	Coarse graded Granular sub-base Material 26.5 mm to 4.75 mm	cum	1984	1804
M-027	Coarse graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	1978	1798
M-028	Coarse graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	1949	1772
M-029	Coarse graded Granular sub-base Material 53 mm to 26.5mm	cum	1891	1719
M-030	Aggregates below 5.6 mm	cum	2424	2204
M-031	Aggregates 22.4 mm to 2.36 mm	cum	2612	2375
M-032	Aggregates 22.4 mm to 5.6 mm	cum	2609	2371
M-033	Aggregates 45 mm to 2.8 mm	cum	2137	1942
M-034	Aggregates 45 mm to 22.4 mm	cum	2111	1919
M-035	Aggregates 53 mm to 2.8 mm	cum	2148	1953
M-036	Aggregates 53 mm to 22.4 mm	cum	2134	1940
M-037	Aggregates 63 mm to 2.8 mm	cum	2131	1937
M-038	Aggregates 63 mm to 45 mm	cum	2070	1882
M-039	Aggregates 90 mm to 45 mm	cum	2035	1850
M-040	Aggregates 10 mm to 5 mm	cum	2394	2177
M-041	Aggregates 11.2 mm to 0.09 mm	cum	2392	2174
M-042	Aggregates 13.2 mm to 0.09 mm	cum	2390	2172
M-043	Aggregates 13.2 mm to 5.6 mm	cum	2384	2167
M-044	Aggregates 13.2 mm to 10 mm	cum	2360	2146
M-045	Aggregates 20 mm to 10 mm	cum	2610	2372
M-046	Aggregates 25 mm to 10 mm	cum	2604	2367
M-047	Aggregates 19 mm to 6 mm	cum	2624	2385
M-048	Aggregates 37.5 mm to 19 mm	cum	2569	2335
M-049	Aggregates 37.5 mm to 25 mm	cum	2563	2330
M-050	Aggregates 6 mm nominal size	cum	2407	2188
M-051	Aggregates 10 mm nominal size	cum	2372	2156
M-052	Aggregates 13.2/12.5 mm nominal size	cum	2360	2146
M-053	Aggregates 20 mm nominal size	cum	2610	2372
M-054	Aggregates 25 mm nominal size	cum	2598	2362
M-055	Aggregates 40 mm nominal size	cum	2111	1919

Sl. No.	Description	Unit	Phek
M-056	AC pipe 100 mm dia	metre	442
M-057	Acrylic polymer bonding coat	litre	510
M-058	Aluminium Paint	litre	538
M-059	Aluminium alloy plate 2mm Thick	sqm	4291
M-060	Aluminium alloy/galvanised steel	tonne	67947
M-061	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	7129
M-062	Aluminium studs 100 x 100 mm fitted with lens reflectors	nos	1749
M-063	Barbed wire	kg	336
M-064	Bearing (Cost of parts)	nos	112363
M-065	Bearing (Cast steel rocker bearing assembly of 250 tonne)	nos	120067
M-066	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	116150
M-067	Bearing (Forged steel roller bearing of 250 tonne	nos	112363
M-068	Bearing (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	nos	112363
M-069	Bearing (PTFE sliding plate bearing assembly of 80 tonnes)	nos	202653
M-070	Bearing (Supply of sliding plate bearing of 80 tonne)	nos	202653
M-071	Bentonite	kg	233
M-072	Binding wire	kg	87
M-073	Bitumen (Cationic Emulsion)	tonne	45086
M-074	Bitumen (60-70 grade)	tonne	41363
M-075	Bitumen (80-100 grade)	tonne	41772
M-076	Bitumen (Cutback)	tonne	41772
M-077	Bitumen (emulsion)	tonne	64904
M-078	Bitumen (modified graded)	tonne	42023
M-079	Brick	each	20
M-080	C.I. shoes for the pile	kg	65
M-081	Cement	tonne	7169.28
M-082	Cold twisted bars (HYSD Bars)	tonne	52915
M-083	Collar for joints 300 mm dia	nos	1137
M-084	Compressible Fibre Board(20mm thick)	sqm	2018
M-085	Connectors/ Staples	each	75
M-086	Copper Plate(12m long x 250mm wide)	kg	1076
M-087	Corrosion resistant Structural steel	tonne	63700
M-088	Corrugated sheet, 3 mm thick, "Thrie" beam section railing	kg	81
M-089	Credit for excavated rock found suitable for use	cum	195
M-090	Curing compound	liter	78
M-091	Delineators from ISI certified firm as per the standard drawing given in IRC - 79	each	942
M-092	Earth Cost or compensation for earth taken from private land	cum	11
M-093	Elastomeric slab seal expansion joint assembly manufactured by using chloroprene, elastomer for elastomeric slab unit conforming to clause 915.1 of IRC: 83 (part II),	metre	15314
M-094	Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each	100 nos	269
M-095	Epoxy compound with accessories for preparing epoxy mortar	kg	742
M-096	Epoxy mortar	kg	657
M-097	Epoxy primer	kg	577
M-098	Epoxy resin-hardener mix for prime coat	kg	457
M-099	Flag of red color cloth 600 x 600 mm	each	70
M-100	Flowering Plants	each	135
M-101	Galvanised MS flat clamp	nos	34
M-102	Galvanised steel wire crates of mesh size 100 mm x 100 mm woven with 4mm dia. GI wire in rolls of required size.	sqm	471
M-103	Galvanised structural steel plate 200 mm wide, 6 mm thick, 24 m long	kg	81
M-104	Gelatin 80%	kg	407
M-105	Geo grids	sqm	81

M-106	Geomembrane	sqm	94
M-107	Geonets	sqm	101
M-108	Geotextile	sqm	102
M-109	Geotextile filter fabric	sqm	108
M-110	GI bolt 10 mm Dia	nos	25
M-111	Grouting pump with agitator	hour	457
M-112	Grass (Doob)	kg	78
M-113	Grass (Fine)	kg	101
M-114	HDPE pipes 75mm dia	metre	834
M-115	HDPE pipes 90mm dia	metre	1143
M-116	Hedge plants	each	15
M-117	Helical pipes 600mm diameter	metre	2263
M-118	Hot applied thermoplastic compound	litre	1093
M-119	HTS strand	tonne	127841
M-120	Joint Sealant Compound	kg	742
M-121	Jute netting, open weave, 2.5 cm square opening for seeding and Mulching	sqm	28
M-122	LDO for steam curing	litre	152
M-123	M.S. Clamps	nos	15
M-124	M.S. Clamps	kg	101
M-125	M.S. shoes @ 35 Kg per pile of 15 m	kg	92
M-126	Mild Steel bars	tonne	52915
M-127	Modular strip/box seal expansion joint including anchorage catering to a horizontal movement beyond 70 mm and upto 140mm assembly comprising of edge beams, central beam, 2 modules chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative	metre	770
M-128	Modular strip/box seal expansion joint catering to a horizontal movement beyond 140mm and upto 210mm box/box seal joint assembly containing 3 modules/cells and comprising of edge beams, two central beams, chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative	metre	1000
M-129	Nipples 12mm	nos	12
M-130	Nuts and bolts	kg	100
M-131	Paint	litre	538
M-132	Pavement Marking Paint	litre	874
M-133	Paving Fabric	sqm	108
M-134	Perforated geosynthetic pipe 150 mm dia	metre	351
M-135	Perforated pipe of cement concrete, internal dia 100 mm	metre	296
M-136	Pesticide	kg	592
M-137	Pipes 200 mm dia, 2.5 m long for drainage	metre	706
M-138	Plastic sheath, 1.25 mm thick for dowel bars	sqm	67
M-139	Plastic tubes 50 cm dia, 1.2 m high	nos	303
M-140	Polymer braids	metre	343
M-141	Pre moulded Joint filler, 25 mm thick for expansion joint.	sqm	503
M-142	Pre-coated stone chips of 13.2 mm nominal size	cum	4842
M-143	Preformed continuous chloroprene elastomer or closed cell foam sealing element with high tear strength, vulcanised in a single operation for the full length of a joint to ensure water tightness.	metre	588
M-144	Pre-moulded asphalt filler board	sqm	804
M-145	Pre-packed cement based polymer concrete of strength 45 Mpa at 28 days	kg	101
M-146	Primer	kg	266
M-147	Quick setting compound	kg	84
M-148	Random Rubble Stone	cum	1297
M-149	RCC Pipe NP 4 heavy duty non pressure pipe 1000 mm dia	metre	15065
M-150	RCC Pipe NP 4 heavy duty non pressure pipe 1200 mm dia	metre	16242
M-151	RCC Pipe NP 4 heavy duty non pressure pipe 300 mm dia	metre	7889
M-152	Reflectors glass beads	kg	464
M-153	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Copper Strips)	metre	471
M-154	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Galvanised carbon steel strips)	metre	229
M-155	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Glass reinforced polymer/fibre reinforced polymer/polymeric strips)	metre	495

M-156	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Stainless steel strips)	metre	538
M-157	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. Aluminium strips)	metre	533
M-158	Rivets	each	340
M-159	Sand bags (Cost of sand and Empty cement bag)	nos	287
M-160	Sapling 2 m high 25 mm dia	each	7
M-161	Scrap tyres of size 900 x 20	nos	433
M-162	Seeds	kg	387
M-163	Selected earth	cum	155
M-164	Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	12
M-165	Sheathing duct	metre	16
M-166	Shrubs	each	12
M-167	Sludge / Farm yard manure @ 0.18 cum per 100 sqm at site of work for turfing	cum	155
M-168	Sodium vapour lamp	each	4641
M-169	Square Rubble Coursed Stone	cum	2045
M-170	Steel circular hollow pole of standard specification for street lighting to mount light at 5 m height above deck level	each	23203
M-171	Steel circular hollow pole of standard specification for street lighting to mount light at 9 m height above road level	each	45734
M-172	Steel drum 300 mm dia 1.2 m high/empty bitumen drum	nos	161
M-173	Steel helmet and cushion block on top of pile head during driving.	kg	235
M-174	Steel pipe 25 mm external dia as per IS:1239	metre	108
M-175	Steel pipe 50 mm external dia as per IS:1239	metre	182
M-176	Steel wire rope 20 mm	kg	269
M-177	Steel wire rope 40 mm	kg	417
M-178	Strip seal expansion joint	metre	28
M-179	Structural Steel	tonne	60667
M-180	Super plastisizer admixture IS marked as per 9103-1999	kg	377
M-181	Synthetic Geogrids as per clause 3102.8 and approved design and specifications.	sqm	511
M-182	Through and bond stone	each	45
M-183	Tie rods 20mm diameter	nos	108
M-184	Tiles size 300 x 300 mm and 25 mm thick	each	100
M-185	Timber	cum	24309
M-186	Traffic cones with 150 mm reflective sleeve	nos	1237
M-187	Tube anchorage set complete with bearing plate, permanent wedges etc	nos	759
M-188	Unstaked lime	tonne	13451
M-189	Water	KL	530
M-190	Water based cement paint	litre	353
M-191	Welded steel wire fabric	kg	101
M-192	Wire mesh 50mm x 50mm size of 3mm wire	kg	97
M-193	Wooden ballies 2" Dia for bracing	each	38
M-194	Wooden ballies 8" Dia and 9 m long	each	175
M-195	Wooden packing	cum	14959
M-196	Wooden staff for fastening of flag 25 mm dia, one m long	each	13

	Overheads for Road Works	10%					
	Contractors profit for Road Works	16%					
	Overheads for Bridge Works	25%			for input of Overheads or Contractors profit please type in column C as like below		
	Overheads for Bridge Works (Rehabilitation)	30%					
	Contractors profit for Bridge Works	16%			Type symbol of apostrophe(') then input value then one space then symbol of percentage (%) for example '08 %		
	Lead from Mixing Plant to working site	10.00	km				
	Lead for E/W borrow area to site	10.00	km				
	Lead for fly ash from source to site	268	km				

Items No.	Summary of Rates calculated and used for analysis of rates of other items	Unit	
Item 8.3	Printing new letter and figures of any shade (ii) English Roman	per cm height per letter	1.10
Item 8.8	Painting Two Coats on New Concrete Surfaces	sqm	228.70
Item 8.9	Painting angle iron post two coats	sqm	142.30
Item 12.6 (B)	Cement mortar 1:2 (Excluding OH & CP)	cum	11,830.00
Item 12.6 (A)	Cement mortar 1:3 (Excluding OH & CP)	cum	11,483.00
Item 12.6 (D)	Cement mortar 1:6 (Excluding OH & CP)	cum	10,938.00
Item 12.7 (A)	Course Rubble masonry in cement mortar 1:3 (including OH & CP)	cum	11,595.00
Item 12.7 (Addl) B)	Random Rubble masonry in cement mortar 1:6 (including OH & CP)	cum	10,040.00
Item 12.8 (A)	PCC Grade M15 including OH & CP for Open Foundation by Mixer	cum	12,200.00
Item 12.8 (A)	PCC Grade M15 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	8,090.00
Item 12.8 (B) PCC	PCC Grade M20 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	8,923.00
Item 12.8 (C)	RCC Grade M20 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	9,072.00
Item 12.8 (C) RCC	RCC Grade M20 including OH & CP for Open Foundation by Batching Plant	cum	10,038.00
Item 12.8 (C)	RCC Grade M20 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	6,657.00
Item 12.8 (D)	PCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	9,320.00
Item 12.8 (D)	PCC Grade M25 including OH & CP for Open Foundation by Batching Plant	cum	10,374.00
Item 12.8 (D)	PCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	6,896.00
Item 12.8 (E)	RCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	9,473.00
Item 12.8 (E)	RCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	7,666.00
Item 12.8 (F)	PCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	9,363.00
Item 12.8 (F)	PCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	6,935.00
Item 12.8 (G)	RCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	9,497.00
Item 12.8 (G)	RCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	7,084.00
Item 12.8 (H)	RCC Grade M35 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	9,607.00
Item 12.8 (H)	RCC Grade M35 including OH & CP for Open Foundation by Batching Plant	cum	8,064.00
Item 12.8 (H)	RCC Grade M35 excluding OH & CP for Open Foundation by Batching Plant	cum	11,693.00
Item 12.8 (H)	RCC Grade M35 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	7,829.00
Item 12.11 (C) i	PCC Grade M20 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	9,894.00
Item 12.11 (C) i	PCC Grade M20 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	7,288.00
Item 12.11 (C) ii	PCC Grade M25 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	10,179.00
Item 12.11 (C) ii	PCC Grade M25 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	7,571.00
Item 12.11 (C) iii	PCC Grade M30 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	10,222.00
Item 12.11 (C) iii	PCC Grade M30 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	7,617.00
Item 12.11 (C) iv	PCC Grade M35 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	10,323.00
Item 12.11 (C) iv	PCC Grade M35 including OH & CP for Well Foundation (Bottom Plug) by Batching Plant	cum	11,656.00
Item 12.11 (C) iv	PCC Grade M35 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	7,571.00
Item 12.11 (F) iv	PCC Grade M35 including OH & CP for Well Foundation (Well Cap) by Batching Plant	cum	10,743.00
Item No. 3.13	Excavation for Structures (Manual Means)	cum	564.00
Item No. 3.13	Excavation for Structures (Mechanical Means)	cum	56.00
Item 14.1(A)	RCC Grade M20 for super-structure including OH & CP by Batching Plant	cum	11,506.00
Item 14.1(B)	RCC Grade M20 for super-structure including OH & CP by Batching Plant	cum	12,240.00
Item 14.1(E)	RCC Grade M20 for super-structure including OH & CP by Batching Plant	cum	14,694.50
Item 14.1(C)	RCC Grade M30 for super-structure including formwork and excluding OH & CP by Batching Plant	cum	8,513.00
Item 14.1(C)	RCC Grade M30 for super-structure excluding formwork and excluding OH & CP by Batching Plant	cum	7,094.00
Item 14.2 A	Supplying, fitting and placing HYSD bar reinforcement in super-structure excluding OH & CP	tonne	62,657.00
Item 13.6	Supplying, fitting and placing HYSD including OH & CP for sub-structure	tonne	88,442.00
Item 5.17	Fog Seal	sqm	74.00
Item 5.21 Case-I	Crack Prevention courses. Case-I Stress Absorbing Membrane (SAM) crack width less than 6 mm	sqm	81.00
Item 5.21 Case-II	Crack Prevention courses. Case-II Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm	sqm	91.00
Item 5.21 Case-IV	Crack Prevention courses. Case-III Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 %	sqm	118.00
Item 5.21 Case-IV	Crack Prevention courses. Case-IV Bitumen Impregnated Geotextile	sqm	205.60
Item 5.15 Case-I	Slurry Seal Case-I 5 mm thickness	sqm	164.00
Item 5.15 Case-II	Slurry Seal Case-II 3 mm thickness	sqm	109.00

Item 5.15 Case-III	Slurry Seal Case III 1.5 mm thickness	sqm	51.00
Item 5.9 Case-I	Surface Dressing Case-I 19 mm nominal chipping size	sqm	116.00
Item 5.9 Case-II	Surface Dressing Case-II 13 mm nominal size chipping	sqm	88.00

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
1.1		Loading and unloading of stone boulder / stone aggregates / sand / kanker / moorum.					
		Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip					
		Unit : cum					
		Taking output = 5.5 cum					
		Time required for					
		i) Positioning of tipper at loading point		1 Min			
		ii) Loading by front end loader 1 cum bucket capacity @ 25 cum per hour		13 Min			
		iii) Maneuvering, reversing, dumping and turning for return		2 Min			
		iv) Waiting time, unforeseen contingencies etc		4 Min			
		Total		20 Min			
		a) Machinery					
		Tipper 5.5 tonnes capacity	hour	0.330	1006.18	332.04	P&M-048
		Front end-loader 1 cum bucket capacity @ 25 cum/hour	hour	0.330	930.98	307.22	P&M-017
		b) Overheads @ 10% on (a)				63.93	
		c) Contractors profit @ 16% on (a+b)				112.51	
		Cost for 5.5 cum = a+b+c				815.70	
		Rate per cum = (a+b+c)/ 5.5				148.31	
	Note	Unloading will be by tipping.		say		148.00	
1.4		Cost of Haulage Excluding Loading and Unloading					
		Haulage of materials by tipper excluding cost of loading, unloading and stacking.					
		Unit : t.km					
		Taking output 10 tonnes load and lead 10 km = 100 t.km					
1.4(I)	Case I	Surfaced Road					
		Speed with load : 25 km / hour.					
		Speed while Returning empty : 35 km / hour.					
		a) Machinery.					
		i) Tipper 10 tonne capacity					
		Time taken for onward haulage with load	hour	0.400	1006.18	402.47	P&M-048
		Time taken for empty return trip.	hour	0.290	1006.18	291.79	P&M-048
		b) Overheads @ 10% on (a)				69.43	
		c) Contractors profit @ 16% on (a+b)				122.19	
		cost for 100 t km = a+b+c				885.88	
		Rate per t.km = (a+b+c)/100				8.86	
					say	8.90	
1.4(II)	Case II	Unsurfaced Gravelled Road					
		Speed with load : 20 km / hour					
		Speed for empty return trip : 30 km / hour					
		a)Machinery					
		Tipper 10 tonnes capacity					
		Time taken for onward hanlage with load	hour	0.500	1006.18	503.09	P&M-048
		Time taken for empty return trip	hour	0.330	1006.18	332.04	P&M-048
		b) Overheads @ 10% on (a)				83.51	
		c) Contractors profit @ 16% on (a+b)				146.98	
		Cost for 100 t.km = a+b+c				1065.63	
		Rate per t.Km = (a+b+c)/100				10.66	
					say	10.70	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
1.4(III)	Case III	Katcha Track and Track in river bed / nallah bed and choe bed.					
		Speed with load : 10 km / hour					
		Speed while returning empty : 15 km / hour					
		a) Machinery					
		i) Tipper 10 tonnes capacity					
		Time taken for onward haulage	hour	1.000	1006.18	1006.18	P&M-048
		Time taken for empty return trip	hour	0.670	1006.18	674.14	P&M-048
		b) Overheads @ 10% on (a)				168.03	
		c) Contractors profit @ 16% on (a+b)				295.74	
		Cost for 100 t.km = a+b+c				2144.10	
		Rate per t.Km = (a+b+c)/100				21.44	
					say	21.40	
1.5		Hand Broken Stone Aggregates 63 mm nominal size					
		Supply of quarried stone, hand breaking into coarse aggregate 63 mm nominal size (passing 80 mm and retained on 50 mm sieve) and stacking as directed					
		Unit : cum					
		Taking output = 1 cum					
		a) Labour					
		Mate	day	0.060	582.53	34.95	L-12
		Mazdoor	day	1.500	529.57	794.35	L-13
		b) Material					
		Supply of quarried stone 150 - 200 mm size	cum	1.100	1138.58	1252.43	M-002
		c) Overheads @ 10% on (a+b)				208.17	
		d) Contractors profit @ 16% on (a+b+c)				366.39	
		Rate per cum = a+b+c+d				2656.30	
					say	2656.00	
5.9	510	Surface Dressing					
		Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller					
		Unit = sqm					
		Taking output = 9000 sqm					
		Case -1:-19 mm nominal chipping size					
		a) Labour					
		Mate	day	0.440	582.53	256.31	L-12
		Mazdoor	day	9.000	529.57	4766.13	L-13
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	540.16	3889.16	P&M-031
		Air compressor 250 cfm	hour	7.200	887.56	6390.43	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	2557.82	15346.94	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	1006.18	6037.10	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Bitumen pressure distributor	hour	6.000	1041.13	6246.81	P&M-004
		Smooth wheeled roller 8-10 tonne weight	hour	6.000	510.51	3063.03	P&M-044
		c) Material					
		Bitumen @ 1.20 kg per sqm	tonne	10.800	41363.28	446723.42	M-074
		Crushed stone chipping, 19 mm nominal size @ 0.015 cum per sqm	cum	135.000	2372.47	320283.87	M-053
		d) Overheads @ 10% on (a+b+c)				81996.60	
		e) Contractors profit @ 16% on (a+b+c+d)				144314.01	
		Cost for 9000 sqm = a+b+c+d+e				1046276.59	
		Rate per sqm = (a+b+c+d+e)/9000				116.25	
					say	116.00	
		Case - II 13 mm nominal size chipping					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.440	582.53	256.31	L-12
		Mazdoor	day	9.000	529.57	4766.13	L-13
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	540.16	3889.16	P&M-031
		Air compressor 250 cfm	hour	7.200	887.56	6390.43	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	2557.82	15346.94	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	1006.18	6037.10	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1041.13	6246.81	P&M-004
		Vibratory roller 8-10 tonne weight	hour	6.000	833.54	5001.26	P&M-059
		c) Material					
		Bitumen @ 1.00 kg per sqm	tonne	9.000	41363.28	372269.52	M-074
		Crushed stone chipping, 13 mm nominal size @ 0.01 cum per sqm	cum	90.000	2145.82	193123.55	M-052
		d) Overheads @ 10% on (a+b+c)				62029.00	
		e) Contractors profit @ 16% on (a+b+c+d)				109171.04	
		Cost for 9000 sqm = a+b+c+d+e				791490.01	
		Rate per sqm = (a+b+c+d+e)/9000				87.94	
					say	88.00	
	Note	1.Where the proposed aggregate fails to pass the stripping test, an approved adhesion agent may be added to the binder as per clause 510.2.4. Alternatively, chips may be pre-coated as per clause 510.2.5					
		2.Input for the second coat, where required, will be the same as per the 1st coat mentioned above					
5.15	516	Slurry Seal					
		Providing and laying slurry seal consisting of a mixture of fine aggregates, portland cement filler, bituminous emulsion and water on a road surface including cleaning of surface, mixing of slurry seal in a suitable mobile plant, laying and compacting to provide even riding surface					
	Case I	5 mm thickness					
		Unit = sqm					
		Taking output = 16000 sqm (80 cum)					
		Taking density of 2.2 tonnes per cum, weight of mix = 264 tonnes					
		weight of mix = 176 tonnes					
		a) Labour					
		Mate	day	0.240	582.53	139.81	L-12
		Mazdoor	day	6.000	529.57	3177.42	L-13
		b) Machinery					
		Mechanical broom	hour	6.000	540.16	3240.97	P&M-031
		Air compressor 250 cfm	hour	6.000	887.56	5325.35	P&M-001
		Mobile slurry seal equipment	hour	6.000	940.52	5643.10	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler.	hour	6.000	1006.18	6037.10	P&M-048
		Pneumatic tyred roller with individual wheel load not exceeding 1.5 tonnes	hour	6.000	1262.49	7574.97	P&M-037
		Water tanker 6 KL capacity	hour	2.000	819.77	1639.55	P&M-060
		c) Material					
		Residual Binder @ 11 % of mix 80 x 2.2 x 0.11	tonne	19.360	64904.31	1256547.34	M-077
		Fine aggregate 4.75 mm and below 87 % of total mix, 80 x 2.2 x 0.87 = 153.12 tonnes. Taking density 1.5, = 153.12/1.5 = 102.08 cum	cum	102.080	6977.61	712274.73	M-005
		Filler @ 2 % of total mix = 80 x 2.2 x 0.02	tonne	3.520	13451.08	47347.78	M-188

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost of water	KL	12.000	529.57	6354.84	M-189
		d) Overheads @ 10% on (a+b+c)				206088.89	
		e) Contractors profit @ 16% on (a+b+c+d)				362716.44	
		Cost for 16000 sqm= a+b+c+d+e				2629694.18	
		Rate per sqm = (a+b+c+d+e)/16000				164.36	
					say	164.00	
	Case II	3 mm thickness					
		Unit = sqm					
		Taking output = 20000 sqm (60 cum)					
		a) Labour					
		Mate	day	0.200	582.53	116.51	L-12
		Mazdoor	day	5.000	529.57	2647.85	L-13
		b) Machinery					
		Mechanical broom	hour	6.000	540.16	3240.97	P&M-031
		Air compressor 250 cfm	hour	6.000	887.56	5325.35	P&M-001
		Mobile slurry seal equipment	hour	6.000	940.52	5643.10	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler	hour	6.000	1006.18	6037.10	P&M-048
		Water tanker 6 KL capacity	hour	2.000	819.77	1639.55	P&M-060
		c) Material					
		Residual Binder @ 13 % of mix = 60 x 2.2 x 0.13	tonne	17.160	64904.31	1113757.87	M-077
		Fine aggregate 3 mm and below 85 % of total mix, 60x 2.2 x 0.85 = 112.2 tonnes. Taking density 1.5,	cum	74.800	6977.61	521925.45	M-005
		Filler @ 2 % of total mix = 60x 2.2 x 0.02	tonne	2.640	13451.08	35510.84	M-188
		Cost of water	KL	12.000	529.57	6354.84	M-189
		d) Overheads @ 10% on (a+b+c)				170778.53	
		e) Contractors profit @ 16% on (a+b+c+d)				300570.22	
		Cost for 30000 sqm= a+b+c+d+e				2179134.07	
		Rate per sqm = (a+b+c+d+e)/20000				108.96	
					say	109.00	
	Case III	1.5 mm thickness					
		Unit = sqm					
		Taking output = 24000 sqm (36 cum)					
		a) Labour					
		Mate	day	0.200	582.53	116.51	L-12
		Mazdoor	day	5.000	529.57	2647.85	L-13
		b) Machinery					
		Mechanical broom	hour	6.000	540.16	3240.97	P&M-031
		Air compressor 250 cfm	hour	6.000	887.56	5325.35	P&M-001
		Mobile slurry seal equipment	hour	6.000	940.52	5643.10	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler.	hour	6.000	1006.18	6037.10	P&M-048
		Water tanker 6 KL capacity	hour	2.000	819.77	1639.55	P&M-060
		c) Material					
		Residual Binder @ 16 % of mix, 36 x 2.2 x 0.16	tonne	12.670	64904.31	822337.54	M-077
		Fine aggregate 2.36 mm and below, 82 % of total mix, 36x 2.2 x 0.82 = 64.94 tonnes. Taking density 1.5	cum	43.300	1856.67	80393.90	M-022
		Filler @ 2 % of total mix = 36x 2.2 x 0.02	tonne	1.580	13451.08	21252.70	M-188
		Cost of water	KL	12.000	529.57	6354.84	M-189
		d) Overheads @ 10% on (a+b+c)				96057.53	
		e) Contractors profit @ 16% on (a+b+c+d)				169061.25	
		Cost for 24000 sqm= a+b+c+d+e				1225694.09	
		Rate per sqm = (a+b+c+d+e)/24000				51.07	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
					say	<u>51.00</u>	
	Note	1. Tack coat, if required to be provided, before laying slurry seal may be measured and paid separately					
5.17	518	Fog Spray					
		Providing and applying low viscosity bitumen emulsion for sealing cracks less than 3 mm wide or incipient fretting or disintegration in an existing bituminous surfacing.					
		Unit = sqm					
		Taking output = 10500 sqm					
		a) Labour					
		Mate	day	0.120	582.53	69.90	L-12
		Mazdoor	day	3.000	529.57	1588.71	L-13
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	540.16	3240.97	P&M-031
		Air compressor 250 cfm	hour	6.000	887.56	5325.35	P&M-001
		Bitumen emulsion pressure distributor @ 1750 sqm per hour	tonne	6.000	1041.13	6246.81	P&M-004
		c) Material					
		Bitumen emulsion @ 0.75 kg per sqm	tonne	7.880	64904.31	511445.92	M-077
		d) Overheads @ 10% on (a+b+c)				52791.77	
		e) Contractors profit @ 16% on (a+b+c+d)				92913.51	
		Cost for 10500 sqm = a+b+c+d+e				673622.94	
		Rate per sqm = (a+b+c+d+e)/10500				64.15	
					say	<u>64.00</u>	
		1. In case it is decided by the engineer to blind the fog spray, the following may be added					
		a) Labour					
		Mate	day	0.160	582.53	93.20	L-12
		Mazdoor for pre-coating of grit	day	4.000	529.57	2118.28	L-13
		c) Material					
		Crushed stone grit 3 mm size @ 3.75 kg per sqm	cum	26.250	1846.08	48459.62	M-024
		Bitumen emulsion for pre-coating grit @ 2 % of grit, 39.38 x 0.02	tonne	0.790	64904.31	51274.40	M-077
						101945.50	
						9.71	
					say	<u>10.00</u>	
5.21	522	Crack Prevention Courses					
	Case - I	Stress Absorbing Membrane (SAM) crack width less than 6 mm					
		Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width below 6 mm after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 9 kg per 10 sqm and spreading 5.6 mm crushed stone aggregates @ 0.11 cum per 10 sqm with hydraulic chip spreader, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902.					
		Unit = sqm					
		Taking output = 10500 sqm					
		a) Labour					
		Mate	day	0.240	582.53	139.81	L-12
		Mazdoor	day	6.000	529.57	3177.42	L-13
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	540.16	3240.97	P&M-031
		Air compressor 250 cfm	hour	6.000	887.56	5325.35	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1041.13	6246.81	P&M-004
		Hydraulic Chip spreader	hour	6.000	2557.82	15346.94	P&M-025

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Smooth wheeled road roller 8-10 tonne	hour	6.000	510.51	3063.03	P&M-044
		c) Material					
		Modified binder	tonne	9.450	42023.21	397119.29	M-078
		Crushed stone aggregates 5.6 mm size	cum	105.000	2188.18	229759.19	M-050
		d) Overheads @ 10% on (a+b+c)				66341.88	
		e) Contractors profit @ 16% on (a+b+c+d)				116761.71	
		Cost for 10500 sqm= a+b+c+d+e				846522.39	
		Rate per sqm = (a+b+c+d+e)/10500				80.62	
					say	81.00	
	Case - II	Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm					
		Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width 6 to 9 mm after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 11 kg per 10 sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 cum per 10 sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902					
		Unit = sqm					
		Taking output = 10500 sqm					
		a) Labour					
		Mate	day	0.240	582.53	139.81	L-12
		Mazdoor	day	6.000	529.57	3177.42	L-13
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	540.16	3240.97	P&M-031
		Air compressor 250 cfem capacity	hour	6.000	887.56	5325.35	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1041.13	6246.81	P&M-004
		Hydraulic Chip spreader	hour	6.000	2557.82	15346.94	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	510.51	3063.03	P&M-044
		c) Material					
		Modified binder	tonne	11.550	42023.21	485368.02	M-078
		Crushed stone chipping 11.2 mm size	cum	105.000	2156.41	226422.90	M-051
		d) Overheads @ 10% on (a+b+c)				74833.12	
		e) Contractors profit @ 16% on (a+b+c+d)				131706.30	
		Cost for 10500 sqm= a+b+c+d+e				954870.67	
		Rate per sqm = (a+b+c+d+e)/10500				90.94	
					say	91.00	
	Case III	Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 %					
		Providing and laying a single coat of a stress absorbing membrane over a cracked road surface, with crack width above 9 mm and cracked area above 50 % after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 15 kg per 10 sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 cum per 10 sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902					
		Unit = sqm					
		Taking output = 10500 sqm					
		a) Labour					
		Mate	day	0.240	582.53	139.81	L-12
		Mazdoor	day	6.000	529.57	3177.42	L-13
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	540.16	3240.97	P&M-031
		Air compressor 250 cfem capacity	hour	6.000	887.56	5325.35	P&M-001

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1041.13	6246.81	P&M-004
		Hydraulic Chip spreader	hour	6.000	2557.82	15346.94	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	510.51	3063.03	P&M-044
		c) Material					
		Modified binder	tonne	15.750	42023.21	661865.48	M-078
		Crushed stone aggregates 11.2 mm size	cum	126.000	2156.41	271707.48	M-051
		d) Overheads @ 10% on (a+b+c)				97149.02	
		e) Contractors profit @ 16% on (a+b+c+d)				170982.27	
		Cost for 10500 sqm= a+b+c+d+e				1239621.45	
		Rate per sqm = (a+b+c+d+e)/10500				118.06	
					say	118.00	
	Case IV	Case - IV : Bitumen Impregnated Geotextile					
		Providing and laying a bitumen impregnated geotextile layer after cleaning the road surface, geotextile conforming to requirements of clause 704.3, laid over a tack coat with 1.05 kg per sqm of paving grade bitumen 80 - 100 penetration and constructed to the requirement of clause 704.4.5					
		Unit = sqm					
		Taking output = 3500 sqm					
		a) Labour					
		Mate	day	0.560	582.53	326.22	L-12
		Mazdoor	day	12.000	529.57	6354.84	L-13
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	2.800	540.16	1512.45	P&M-031
		Air compressor 250 cfem capacity	hour	2.800	887.56	2485.17	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	tonne	2.000	1041.13	2082.27	P&M-004
		Pneumatic roller	hour	2.000	1262.49	2524.99	P&M-037
		c) Material					
		Paving grade bitumen of 80 - 100 penetration @ 1.05 kg per sqm	tonne	3.680	41771.81	153720.24	M-075
		Geotextile including 10 % for overlaps	sqm	3850.000	102.23	393578.46	M-108
		d) Overheads @ 10% on (a+b+c)				56396.15	
		e) Contractors profit @ 16% on (a+b+c+d)				99257.23	
		Cost for 10500 sqm= a+b+c+d+e				719614.89	
		Rate per sqm = (a+b+c+d+e)/3500				205.60	
					say	205.60	
	NOTE	As bitumen overlay construction shall follow closely the fabric placement on the same day, an output of 3500 sqm only has been considered for the analysis which will cover a length of 500 m, of 7 m wide carriageway. This can be conveniently overlaid by a bituminous course in a day					
8.3	801	Printing new letter and figures of any shade					
		Printing new letter and figures of any shade with synthetic enamel paint black or any other approved colour to give an even shade					
		ii) English and Roman					
		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					
		a) Labour					
		Mate	day	0.07	583	40.78	
		Painter 1st class	day	1.25	635	794.35	
		Mazdoor	day	0.50	530	264.78	
		b) Material					
		Paint	Litre	0.50	538	269.02	
		c) Overheads @ 10% on (a+b)				136.89	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Contractors profit @ 16% on (a+b+c)				240.93	
		Cost for 1600 cm = a+b+c+d				1746.77	
		Rate per cm height per letter = (a+b+c +d)/1600				1.09	
					<u>say</u>	<u>1.10</u>	
8.8	803	Painting Two Coats on New Concrete Surfaces					
		Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces					
		Unit = sqm					
		Taking output = 40 sqm					
		a) Labour					
		Mate	day	0.12	583	69.90	
		Painter	day	2.00	635	1270.97	
		Mazdoor	day	1.00	530	529.57	
		b) Material					
		Paint conforming to requirement of clause 803.3.	Litre	6.00	874	5245.92	
		Add for scaffolding @ 1% of labour cost where required				52.46	
		c) Overheads @ 10% on (a+b)				716.88	
		d) Contractors profit @ 16% on (a+b+c)				1261.71	
		Cost for 40 sqm = a+b+c+d				9147.41	
		Rate per sqm = (a+b+c+d)/40				228.69	
					<u>say</u>	<u>228.70</u>	
8.9	803	Painting on Steel Surfaces					
		Providing and applying two coats of ready mix paint of approved brand on steel surface after through cleaning of surface to give an even shade					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.03	583	17.48	
		Painter	day	0.45	635	285.97	
		Mazdoor	day	0.25	530	132.39	
		b) Material					
		Paint ready mixed approved brand.	Litre	1.25	538	672.55	
		Add @ 1% on cost of material for scaffolding				6.73	
		c) Overheads @ 10% on (a+b)				111.51	
		d) Contractors profit @ 16% on (a+b+c)				196.26	
		Cost for 10 sqm = a+b+c+d				1422.89	
		Rate per sqm = (a+b+c+d)/10				142.29	
					<u>say</u>	<u>142.30</u>	
12.6	Sub-analysis (A)	Cement mortar 1:3 (1cement :3 sand)					
		Unit = 1 cum					
		Taking output = 1 cum					
		a) Materials					
		Cement	MT	0.51	7169.28	3656.33	
		Sand	cum	1.05	6977.61	7326.49	
		b) Labour					
		Mate	day	0.04	582.53	23.30	
		Mazdoor	day	0.90	529.57	476.61	
		Total Material and Labour = (a+b)				11483.00	
	Sub-analysis (B)	Cement mortar 1:2 (1cement :2 sand)					
		Unit = 1 cum					
		Taking output = 1 cum					
		a) Materials					
		Cement	MT	0.67	7169.28	4817.76	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Sand	cum	0.93	6977.61	6512.44	
		b) Labour					
		Mate	day	0.04	582.53	23.30	
		Mazdoor	day	0.90	529.57	476.61	
		Total Material and Labour = (a+b)				11830.00	
	Sub-analysis (D)	Cement mortar 1:6 (1cement :6 sand)					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Materials					
		Cement	MT	0.29	7169.28	2064.75	
		Sand	cum	1.20	6977.61	8373.14	
		b) Labour					
		Mate	day	0.04	582.53	23.30	
		Mazdoor	day	0.90	529.57	476.61	
		Total Material and Labour = (a+b)				10938.00	
12.7	1400	Stone masonry work in cement mortar 1:3 in foundation complete as drawing and Technical Specification					
		<i>Unit = cum</i>					
		<i>Taking output = 5 cum</i>					
	(A)	Square Rubble Coursed Rubble Masonry (first sort)					
		a) Material					
		Stone	cum	5.50	2045.46	11250.05	M-169
		Through and bond stone	each	35.00	45.45	1590.92	M-182
		(35nos.x0.24mx0.24mx0.39m = 0.79 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	1.50	11483.00	17224.50	Item 12.6 (A)
		b) Labour					
		Mate	day	0.66	582.53	384.47	L-12
		Mason	day	7.50	635.48	4766.13	L-11
		Mazdoor	day	9.00	529.57	4766.13	L-13
		c) Overhead charges @ 25% on (a+b)				9995.55	
		d) Contractor's profit @ 16% on (a+b+c)				7996.44	
		Cost for 5 cum = a+b+c+d				57974.18	
		Rate per cum (a+b+c+d)/5				11594.84	
					say	11595.00	
	1405.3	B) Random Rubble Masonry					
		(coursed/uncoursed)					
		<i>Unit = cum</i>					
		<i>Taking output = 5 cum</i>					
		a) Material					
		Stone	cum	5.50	1297.45	7135.95	
		Through and bond stone	Nos	35.00	45.45	1590.92	
		(35nos.x0.24mx0.24mx0.39m = 0.79 cu.m)					
		Cement mortar 1:3 (Rate as in item 12.6 A)	cum	1.55	11483.00	17798.65	
		b) Labour					
		Mate	day	0.62	582.53	361.17	
		Mason	day	6.00	635.48	3812.90	
		Mazdoor	day	9.00	529.57	4766.13	
		c) Overheads @ 25% on (a+b)				8866.43	
		d) Contractors profit @ 16% on (a+b+c)				7093.14	
		Cost for 5 cum = a+b+c+d				51425.29	
		Rate per cum (a+b+c+d)/5				10285.06	
					say	10285.00	
	@	The labour already considered in cement mortar has been taken into account while proposing labour for masonry works.					
12.7 (Add)	1400	Stone masonry work in cement mortar 1:6 in foundation complete as drawing and Technical Specification					
		<i>Unit = cum</i>					
		<i>Taking output = 5 cum</i>					
	1405.3	B) Random Rubble Masonry					
		(coursed/uncoursed)					
		<i>Unit = cum</i>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Taking output = 5 cum					
		a) Material					
		Stone	cum	5.50	1297.45	7135.95	
		Through and bond stone	Nos	35.00	45.45	1590.92	
		(35nos.x0.24mx0.24mx0.39m = 0.79 cu.m)					
		Cement mortar 1:3 (Rate as in item 13.6 D)	cum	1.55	10938.00	16953.90	
		b) Labour					
		Mate	day	0.62	582.53	361.17	
		Mason	day	6.00	635.48	3812.90	
		Mazdoor	day	9.00	529.57	4766.13	
		c) Overheads @ 25% on (a+b)				8655.24	
		d) Contractors profit @ 16% on (a+b+c)				6924.19	
		Cost for 5 cum = a+b+c+d				50200.41	
		Rate per cum (a+b+c+d)/5				10040.08	
					say	10040.00	
	@	The labour already considered in cement mortar has been taken into account while proposing labour for masonry works.					
12.8	1500, 1700 & 2100	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications					
	A	PCC Grade M15					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Cement	MT	4.13	7169.28	29609.13	
		Coarse sand	cum	6.75	6977.61	47098.89	
		40 mm Aggregate	cum	8.10	1919.16	15545.21	
		20 mm Aggregate	cum	4.05	2372.47	9608.52	
		10 mm Aggregate	cum	1.35	2156.41	2911.15	
		b) Labour					
		Mate	day	0.86	582.53	500.97	
		Mason	day	1.50	635.48	953.23	
		Mazdoor	day	20.00	529.57	10591.40	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	
		Generator 63 KVA	hour	6.00	379.17	2275.03	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		8,090.00			
		d) Formwork @ 4% on cost of concrete i.e. cost of material, labour and machinery				4853.98	
		e) Overheads @ 25% on (a+b+c+d)				31550.87	
		f) Contractors profit @ 16% on (a+b+c+d+e)				25240.69	
		Cost for 15 cum = a+b+c+d+e+f				182995.02	
		Rate per cum (a+b+c+d+e+f)/15				12199.67	
					say	12200.00	
	Note	Nedle Vibrator is an item of minor T & P which is already included in overhead charges. Hence not added in rate analysis of cement concrete works.					
12.8	B	PCC Grade M20					
		Unit : cum					
		Taking output = 15 cum					
		a) Material					
		Cement	MT	5.16	7169.28	36993.48	
		Coarse sand	cum	6.75	6977.61	47098.89	
		40 mm Aggregate	cum	5.40	1919.16	10363.47	
		20 mm Aggregate	cum	5.40	2372.47	12811.35	
		10 mm Aggregate	cum	2.70	2156.41	5822.30	
		b) Labour					
		Mate	day	0.86	582.53	500.97	
		Mason	day	1.50	635.48	953.23	
		Mazdoor	day	20.00	529.57	10591.40	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	
		Generator 33 KVA	hour	6.00	1075.56	6453.34	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		8,923.00			

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.8	C	RCC Grade M20					
		Unit = cum					
	Case I	Using concrete mixer					
		Taking output = 15 cum					
		a) Material					
		Cement	MT	5.21	7169.28	37351.95	
		Coarse sand	cum	6.75	6977.61	47098.89	
		20 mm Aggregate	cum	8.10	2372.47	19217.03	
		10 mm Aggregate	cum	5.40	2156.41	11644.61	
		b) Labour					
		Mate	day	0.86	582.53	500.97	
		Mason	day	1.50	635.48	953.23	
		Mazdoor	day	20.00	529.57	10591.40	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	
		Generator 33 KVA	hour	6.00	1075.56	6453.34	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9,072.00			
	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Unit : cum					
		Taking Output = 120 cum					
		a) Material					
		Cement	MT	41.66	7169.28	298672.20	
		Coarse Sand	cum	54.00	1297.45	70062.10	
		20 mm Aggregate	cum	64.80	2609.72	169109.88	
		10 mm Aggregate	cum	43.20	2372.05	102472.54	
		b) Labour					
		Mate	day	0.84	582.53	489.32	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	18.00	529.57	9532.26	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	
		Lead beyond 1 km, L-lead in km	T-km	300L	38.45	115340.32	L= 10
		Concrete Pump	hour	6	409.89	2459.32	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		6,657.00			
		d) Formwork @ 4% on cost of concrete i.e. cost of material, labour and machinery				31952.13	
		e) Overheads @ 25% on (a+b+c+d)				207688.84	
		f) Contractors profit @ 16% on (a+b+c+d+e)				166151.07	
		Cost for 120 cum = a+b+c+d+e+f				1204595.26	
		Rate per cum = (a+b+c+d+e+f)/120				10038.29	
					say	10038.00	
12.8	D	PCC Grade M25					
		Unit = cum					
	Case I	Using concrete Mixer					
		Taking output = 15 cum					
		a) Material					
		Cement	MT	5.99	7169.28	42943.99	
		Coarse sand	cum	6.75	6977.61	47098.89	
		40 mm Aggregate	cum	5.40	1919.16	10363.47	
		20 mm Aggregate	cum	5.40	2372.47	12811.35	
		10 mm Aggregate	cum	2.70	2156.41	5822.30	
		b) Labour					
		Mate	day	0.86	582.53	500.97	
		Mason	day	1.50	635.48	953.23	
		Mazdoor	day	20.00	529.57	10591.40	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	
		Generator 33 KVA	hour	6.00	1075.56	6453.34	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9,320.00			
	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Unit : cum					
		Taking Output = 120 cum					
		a) Material					
		Cement	MT	47.95	7169.28	343766.98	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Coarse sand	cum	54.00	1297.45	70062.10	
		40 mm Aggregate	cum	43.20	2111.08	91198.54	
		20 mm Aggregate	cum	43.20	2609.72	112739.92	
		10 mm Aggregate	cum	21.60	2372.05	51236.27	
		b) Labour					
		Mate	day	0.84	582.53	489.32	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	18.00	529.57	9532.26	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L= 10
		Concrete Pump	hour	6	409.89	2459.32	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		6,896.00			
		d) Formwork @ 3.75% of cost of concrete i.e. cost of material, labour and machinery				31030.89	
		e) Overheads @ 25% on (a+b+c+d)				214630.30	
		f) Contractors profit @ 16% on (a+b+c+d+e)				171704.24	
		cost of 120 cum = a+b+c+d+e+f				1244855.73	
		Rate per cum (a+b+c+d+e+f)/120				10373.80	
					say	10374.00	
12.8	E	RCC Grade M25					
		Unit = cum					
	Case I	Using concrete Mixer					
		Taking output = 15 cum					
		a) Material					
		Cement	MT	6.05	7169.28	43374.14	
		Coarse sand	cum	6.75	6977.61	47098.89	
		20 mm Aggregate	cum	8.10	2372.47	19217.03	
		10 mm Aggregate	cum	5.40	2156.41	11644.61	
		b) Labour					
		Mate	day	0.86	582.53	500.97	
		Mason	day	1.50	635.48	953.23	
		Mazdoor	day	20.00	529.57	10591.40	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	
		Generator 33 KVA	hour	6.00	1075.56	6453.34	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9,473.00			
	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Unit : cum					
		Taking Output = 120 cum					
		a) Material					
		Cement	MT	48.38	7169.28	346849.77	
		Coarse sand	cum	54.00	1297.45	70062.10	
		20 mm Aggregate	cum	64.80	2609.72	169109.88	
		10 mm Aggregate	cum	43.20	2372.05	102472.54	
		Admixer	Kg	193.52	376.63	72885.46	
		b) Labour					
		Mate	day	0.84	582.53	489.32	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	18.00	529.57	9532.26	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader 1 cum capacity 1 cum	hour	6.00	930.98	5585.90	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L= 10
		Concrete Pump	hour	6.00	409.89	2459.32	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7,666.00			
12.8	F	PCC Grade M30					
		Unit = cum					
	Case I	Using Concrete Mixer					
		Taking output = 15 cum					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Material					
		Cement	MT	6.08	7169.28	43589.22	
		Coarse sand	cum	6.75	6977.61	47098.89	
		40 mm Aggregate	cum	5.40	1919.16	10363.47	
		20 mm Aggregate	cum	5.40	2372.47	12811.35	
		10 mm Aggregate	cum	2.70	2156.41	5822.30	
		b) Labour					
		Mate	day	0.86	582.53	500.97	
		Mason	day	1.50	635.48	953.23	
		Mazdoor	day	20.00	529.57	10591.40	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	
		Generator 33 KVA	hour	6.00	1075.56	6453.34	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9,363.00			
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit : cum					
		Taking Output = 120 cum					
		a) Material					
		Cement	MT	48.60	7169.28	348427.01	
		Coarse sand	cum	54.00	1297.45	70062.10	
		40 mm Aggregate	cum	43.20	2111.08	91198.54	
		20 mm Aggregate	cum	43.20	2609.72	112739.92	
		10 mm Aggregate	cum	21.60	2372.05	51236.27	
		b) Labour					
		Mate	day	0.84	582.53	489.32	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	18.00	529.57	9532.26	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L= 10
		Concrete Pump	hour	6.00	409.89	2459.32	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		6,935.00			
12.8	G	RCC Grade M30					
	Case I	Using Concrete Mixer					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Cement	MT	6.10	7169.28	43732.61	
		Coarse sand	cum	6.75	6977.61	47098.89	
		20 mm Aggregate	cum	8.10	2372.47	19217.03	
		10 mm Aggregate	cum	5.40	2156.41	11644.61	
		b) Labour					
		Mate	day	0.86	582.53	500.97	
		Mason	day	1.50	635.48	953.23	
		Mazdoor	day	20.00	529.57	10591.40	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	
		Generator 33 KVA	hour	6.00	1075.56	6453.34	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9,497.00			
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	MT	48.80	7169.28	349860.86	
		Coarse sand	cum	54.00	1297.45	70062.10	
		20 mm Aggregate	cum	64.80	2609.72	169109.88	
		10 mm Aggregate	cum	43.20	2372.05	102472.54	
		b) Labour					
		Mate	day	0.84	582.53	489.32	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	18.00	529.57	9532.26	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L= 10
		Concrete Pump	hour	6.00	409.89	2459.32	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7,084.00			
12.8	H	RCC Grade M35					
	Case I	Using Concrete Mixer					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Cement	MT	6.33	7169.28	45381.54	
		Coarse sand	cum	6.75	6977.61	47098.89	
		20 mm Aggregate	cum	8.10	2372.47	19217.03	
		10 mm Aggregate	cum	5.40	2156.41	11644.61	
		b) Labour					
		Mate	day	0.86	582.53	500.97	
		Mason	day	1.50	635.48	953.23	
		Mazdoor	day	20.00	529.57	10591.40	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	
		Generator 33 KVA	hour	6.00	1075.56	6453.34	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9,607.00			
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit ; cum					
		Taking Output = 120 cum					
		a) Material					
		Cement	MT	50.64	7169.28	363052.34	
		Coarse sand	cum	54.00	1297.45	70062.10	
		20 mm Aggregate	cum	64.80	2609.72	169109.88	
		10 mm Aggregate	cum	43.20	2372.05	102472.54	
		Admixer	Kg	202.56	376.63	76290.19	
		b) Labour					
		Mate	day	0.84	582.53	489.32	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	18.00	529.57	9532.26	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L= 10
		Concrete Pump	hour	6.00	409.89	2459.32	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7,829.00			
		d) Formwork @ 3% on cost of concrete i.e. cost of material, labour and machinery				28184.21	
		e) Overheads @ 25% on (a+b+c+d)				241914.44	
		f) Contractors profit @ 16% on (a+b+c+d+e)				193531.55	
		cost of 120 cum = a+b+c+d+e+f				1403103.75	
		Rate per cum (a+b+c+d+e+f)/120				11692.53	
					say	11693.00	
		Rate per cum (a+b+c+d)/120 Excluding OH & CP				8064.00	
	Note:	Where ever concrete is carried out using batching plant, transit mixer, concrete pump, admixers @ 0.4% of weight of cement may be added for achieving desired slump of concrete.					
12.11	1200, 1500 & 1700	Plain/Reinforced cement concrete, in well foundation complete as per drawing and technical specification					
	C	Bottom Plug					
		Concrete to be placed using tremie pipe					
	Case I	Using Concrete Mixer					
	(i)	PCC Grade M20					
		Unit = cum					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Taking output = 15 cum					
		a) Material					
		Cement	MT	5.55	7169.28	39789.50	
		Coarse sand	cum	6.75	6977.61	47098.89	
		40 mm Aggregate	cum	5.40	1919.16	10363.47	
		20 mm Aggregate	cum	5.40	2372.47	12811.35	
		10 mm Aggregate	cum	2.70	2156.41	5822.30	
		Admixer	Kg	18.60	376.63	7005.32	
		b) Labour					
		Mate	day	0.90	582.53	524.27	
		Mason	day	1.50	635.48	953.23	
		Mazdoor	day	20.00	529.57	10591.40	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	
		Generator 33 KVA	hour	6.00	1075.56	6453.34	
		Light Crane 3 tonnes capacity for handling tremie pipe	hour	6.00	788.00	4728.00	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9894.00			
	Note	10% extra cement may be added where under water concreting is involved.					
	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Unit ; cum					
		Taking Output = 120 cum					
		a) Material					
		Cement	MT	44.40	7169.28	318316.03	
		Coarse sand	cum	54.00	1297.45	70062.10	
		20 mm Aggregate	cum	64.80	2609.72	169109.88	
		10 mm Aggregate	cum	43.20	2372.05	102472.54	
		Admixer	Kg	148.80	376.63	56042.56	
		b) Labour					
		Mate	day	0.88	582.53	512.62	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	18.00	529.57	9532.26	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L= 10
		Concrete Pump	hour	6.00	409.89	2459.32	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7288.00			
	(ii)	PCC Grade M25					
	Case I	Using Concrete Mixer					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Cement	MT	5.99	7169.28	42943.99	
		Coarse sand	cum	6.75	6977.61	47098.89	
		40 mm Aggregate	cum	5.40	1919.16	10363.47	
		20 mm Aggregate	cum	5.40	2372.47	12811.35	
		10 mm Aggregate	cum	2.70	2156.41	5822.30	
		Admixer	Kg	21.60	376.63	8135.21	
		b) Labour					
		Mate	day	0.90	582.53	524.27	
		Mason	day	1.50	635.48	953.23	
		Mazdoor	day	20.00	529.57	10591.40	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	
		Generator 33 KVA	hour	6.00	1075.56	6453.34	
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	788.00	4728.00	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		10179.00			
	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Unit = cum					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Taking output = 120 cum					
		a) Material					
		Cement	MT	47.88	7169.28	343265.13	
		Coarse sand	cum	54.00	1297.45	70062.10	
		20 mm Aggregate	cum	64.80	2609.72	169109.88	
		10 mm Aggregate	cum	43.20	2372.05	102472.54	
		Admixer	Kg	172.80	376.63	65081.68	
		b) Labour					
		Mate	day	0.88	582.53	512.62	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	18.00	529.57	9532.26	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L = 10
		Concrete Pump	hour	6.00	409.89	2459.32	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7571.00			
	(iii)	PCC Grade M30					
	Case I	Using Concrete Mixer					
		Unit = 1 cum					
		Taking output = 15 cum					
		a) Material					
		Cement	MT	6.08	7169.28	43589.22	
		Coarse sand	cum	6.75	6977.61	47098.89	
		40 mm Aggregate	cum	5.40	1919.16	10363.47	
		20 mm Aggregate	cum	5.40	2372.47	12811.35	
		10 mm Aggregate	cum	2.70	2156.41	5822.30	
		Admixer	Kg	21.60	376.63	8135.21	
		b) Labour					
		Mate	day	0.90	582.53	524.27	
		Mason	day	1.50	635.48	953.23	
		Mazdoor	day	20.00	529.57	10591.40	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	
		Generator 33 KVA	hour	6.00	1075.56	6453.34	
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	788.00	4728.00	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		10222.00			
	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	MT	48.64	7169.28	348713.78	
		Coarse sand	cum	54.00	1297.45	70062.10	
		20 mm Aggregate	cum	64.80	2609.72	169109.88	
		10 mm Aggregate	cum	43.20	2372.05	102472.54	
		Admixer	Kg	172.80	376.63	65081.68	
		b) Labour					
		Mate	day	0.88	582.53	512.62	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	18.00	529.57	9532.26	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L = 10
		Concrete Pump	hour	6.00	409.89	2459.32	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7617.00			
	(iv)	PCC Grade M35					
	Case I	Using Concrete Mixer					
		Unit = 1 cum					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Taking output = 15 cum					
		a) Material					
		Cement	MT	6.29	7169.28	45094.77	
		Coarse sand	cum	6.75	6977.61	47098.89	
		40 mm Aggregate	cum	5.40	1919.16	10363.47	
		20 mm Aggregate	cum	5.40	2372.47	12811.35	
		10 mm Aggregate	cum	2.70	2156.41	5822.30	
		Admixer	Kg	21.60	376.63	8135.21	
		b) Labour					
		Mate	day	0.90	582.53	524.27	
		Mason	day	1.50	635.48	953.23	
		Mazdoor	day	20.00	529.57	10591.40	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	
		Generator 33 KVA	hour	6.00	1075.56	6453.34	
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	788.00	4728.00	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		10323.00			
	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	MT	50.28	7169.28	360471.40	
		Coarse sand	cum	54.00	1297.45	70062.10	
		20 mm Aggregate	cum	64.80	2609.72	169109.88	
		10 mm Aggregate	cum	43.20	2372.05	102472.54	
		Admixer	Kg	172.80	376.63	65081.68	
		b) Labour					
		Mate	day	0.88	582.53	512.62	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	18.00	529.57	9532.26	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L= 10
		Concrete Pump	hour	6.00	409.89	2459.32	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7715.00			
		Add 5% of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				38957.45	
		d) Overheads @ 25% on (a+b+c)				241166.21	
		e) Contractors profit @ 16% on (a+b+c+d)				192932.97	
		cost of 120 cum = a+b+c+d+e				1398764.03	
		Rate per cum (a+b+c+d+e)/120				11656.37	
					Say	11656.00	
	F	Well cap					
	iv)	RCC Grade M35					
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	MT	50.64	7169.28	363052.34	
		Coarse sand	cum	54.00	1297.45	70062.10	
		20 mm Aggregate	cum	64.80	2609.72	169109.88	
		10 mm Aggregate	cum	43.20	2372.05	102472.54	
		b) Labour					
		Mate	day	0.84	582.53	489.32	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	18.00	529.57	9532.26	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader(capacity 1 cum)	hour	6.00	930.98	5585.90	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Transit Mixer (capacity 4.0 cu.m)					
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	
		Lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L= 10
		Concrete Pump	hour	6.00	409.89	2459.32	
		Formwork @ 3% of (a+b+c)				25895.50	
		d) Overheads @ 25% on (a+b+c)				222269.71	
		e) Contractors profit @ 16% on (a+b+c+d)				177815.77	
		cost of 120 cum = a+b+c+d+e				1289164.34	
		Rate per cum (a+b+c+d+e)/120				10743.04	
					Say	10743.00	
	Note	Where ever concrete is carried out using batching plant, transit mixer, concrete pump, admixers @ 0.4% of weight of cement may be added for achieving desired slump of concrete.					
3.13	304	Excavation for Structures					
		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, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.					
		l) Ordinary soil					
		Unit = cum					
		Taking output = 10 cum					
	A	Manual Means					
		(i) Depth upto 3 m					
		a) Labour					
		Mate	day	0.320	582.53	186.41	L-12
		Mazdoor	day	8.000	529.57	4236.56	L-13
		b) Overheads @ 10% on (a)				442.30	
		c) Contractors profit @ 16% on (a+b)				778.44	
		Cost for 10 cum = a+b+c				5643.71	
		Rate per cum = (a+b+c)/10				564.37	
					say	564.00	
	Note	Cost of dewatering may be added where required upto 10 % of labour cost Assessment for dewatering shall be made as per site conditions..					
	B	Mechanical Means					
		(i) Depth upto 3 m					
		Unit = cum					
		Taking output = 300 cum					
		a) Labour					
		Mate	day	0.32	583	186.41	
		Mazdoor	day	8.00	530	4236.56	
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1445	8668.00	
		c) Overheads @ 10% on (a+b)				1309.10	
		d) Contractors profit @ 16% on (a+b+c)				2304.01	
		Cost for 300 cum = a+b+c+d				16704.07	
		Rate per cum = (a+b+c+d)/300				55.68	
					say	56.00	
	Note	Cost of dewatering upto 5% of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions..					
13.6	Section 1600 & 2200	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications					
		Output : MT					
		Taking output = 1 MT					
		a) Material					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		HYSD bars including 5% overlaps and wastage	MT	1.05	52915.23	55560.99	
		Binding wire	kg	6.00	87.00	522.00	
		b) Labour for cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.34	582.53	198.06	
		Blacksmith	day	2.00	635.48	1270.97	
		Mazdoor	day	6.50	529.57	3442.20	
		c) Overheads @ 25% on (a+b)				15248.56	
		d) Contractors profit @ 16% on (a+b+c)				12198.84	
		Rate for per MT (a+b+c+d)				88441.62	
					say	88442.00	
14.1	1500 & 1600 1700	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification					
	A	RCC Grade M20					
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	MT	40.92	7169.28	293366.94	
		Coarse sand	cum	54.00	1297.45	70062.10	
		20 mm Aggregate	cum	64.80	2609.72	169109.88	
		10 mm Aggregate	cum	43.20	2372.05	102472.54	
		b) Labour					
		Mate	day	0.84	582.53	489.32	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	18.00	529.57	9532.26	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader	hour	6.00	930.98	5585.90	
		Transit Mixer (capacity 4.0 cu.m)					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	165.23	2478.39	
		Lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L= 10
		Concrete Pump	hour	6.00	409.89	2459.32	
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		793498.00			
	(i)	For solid slab super-structure, 20-30% of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				793498.00	
		d) Formwork and staging 20 % of (a+b+c)		20.00		158699.60	
		e) Overheads @ 25% on (a+b+c+d)				238049.40	
		f) Contractors profit @ 16% on (a+b+c+d+e)				190439.52	
		Cost for 15 cum = a+b+c+d+e+f				1380686.52	
		Rate per cum (a+b+c+d+e+f)/120				11505.72	
					say	11506.00	
	B	RCC Grade M25					
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	MT	47.95	7169.28	343766.98	
		Coarse sand	cum	54.20	1297.45	70321.59	
		20 mm Aggregate	cum	64.80	2609.72	169109.88	
		10 mm Aggregate	cum	43.20	2372.05	102472.54	
		b) Labour					
		Mate	day	0.84	582.53	489.32	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	18.00	529.57	9532.26	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader	hour	6.00	930.98	5585.90	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Transit Mixer (capacity 4.0 cu.m)					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	165.23	2478.39	
		Lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L= 10
		Concrete Pump	hour	6.00	409.89	2459.32	
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		844158.00			
		For formwork and staging add the following:					
	(i)	For solid slab super-structure, 20-30% of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				844158.00	
	d)	Formwork and staging 20 % of (a+b+c)		20.00		168831.60	
	e)	Overheads @ 25% on (a+b+c+d)				253247.40	
	f)	Contractors profit @ 16% on (a+b+c+d+e)				202597.92	
		Cost for 15 cum = a+b+c+d+e+f				1468834.92	
		Rate per cum (a+b+c+d+e+f)/120				12240.29	
					say	12240.00	
	C	RCC Grade M 30					
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump.					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	MT	48.79	7169.28	349789.17	
		Coarse sand	cum	54.60	1297.45	70840.56	
		20 mm Aggregate	cum	64.80	2609.72	169109.88	
		10 mm Aggregate	cum	43.20	2372.05	102472.54	
		b) Labour					
		Mate	day	0.88	582.53	512.62	
		Mason	day	3.00	635.48	1906.45	
		Mazdoor	day	19.00	529.57	10061.83	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader	hour	6.00	930.98	5585.90	
		Transit Mixer (capacity 4.0 cu.m)					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	165.23	2478.39	
		Lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L= 10
		Concrete Pump	hour	6.00	409.89	2459.32	
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		851252.00			
		For formwork and staging add the following:					
	(i)	For solid slab super-structure, 20-30% of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				851252.00	
	d)	Formwork and staging 20 % of (a+b+c)		20.00		170250.40	
	e)	Overheads @ 25% on (a+b+c+d)				255375.60	
	f)	Contractors profit @ 16% on (a+b+c+d+e)				204300.48	
		Cost for 15 cum = a+b+c+d+e+f				1481178.48	
		Rate per cum (a+b+c+d+e+f)/120				12343.15	
					say	12343.00	
		Rate per cum (a+b+c+d)/120 (including formwork and excluding OH & CP)				8513.00	
		Rate per cum (a+b+c+d)/120 (excluding formwork and Excluding OH & CP)				7094.00	
	E	PSC Grade M-40					
	Case 1	Using concret mixer.					
		Unit = 1 cum					
		Taking output = 15 cum					
		a) Material					
		Cement	MT	6.45	7169.28	46241.86	
		Coarse sand	cum	6.75	6977.61	47098.89	
		20 mm Aggregate	cum	8.10	2372.47	19217.03	
		10 mm Aggregate	cum	5.40	2156.41	11644.61	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Admixture @ 0.4% of cement	kg	25.80	376.63	9717.06	
		b) Labour					
		Mate	day	0.96	582.53	559.23	
		Mason	day	2.00	635.48	1270.97	
		Mazdoor	day	22.00	529.57	11650.54	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	
		Generator 33 KVA	hour	6.00	1075.56	6453.34	
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum		156110.00			
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	MT	51.60	7169.28	369934.85	
		Coarse sand	cum	54.00	1297.45	70062.10	
		20 mm Aggregate	cum	64.80	2609.72	169109.88	
		10 mm Aggregate	cum	43.20	2372.05	102472.54	
		Admixture @ 0.4% of cement	kg	206.40	376.63	77736.45	
		Admixer	Kg	216.00	376.63	81352.10	
		b) Labour					
		Mate	day	0.94	582.53	547.58	
		Mason	day	3.50	635.48	2224.19	
		Mazdoor	day	20.00	529.57	10591.40	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	
		Generator 100 KVA	hour	6.00	1253.49	7520.95	
		Loader	hour	6.00	930.98	5585.90	
		Transit Mixer (capacity 4.0 cu.m)					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	165.23	2478.39	
		Lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	38.45	115340.32	L= 10
		Concrete Pump	hour	6.00	409.89	2459.32	
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		1030590.00			
		For formwork and staging add the following:					
	(i)	For solid slab super-structure, 18-28% of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1030590.00	
		d) Formwork and staging 18 % of (a+b+c)		18.00		185506.20	
		e) Overheads @ 25% on (a+b+c+d)				304024.05	
		f) Contractors profit @ 16% on (a+b+c+d+e)				243219.24	
		Cost for 15 cum= a+b+c+d+e+f				1763339.49	
		Rate per cum (a+b+c+d+e+f)/120				14694.50	
					say	<u>14694.00</u>	
	Note	1.Where ever concrete is carried out using batching plant, transit mixer, concrete pump, admixers conforming IS: 9103 @ 0.4% of weight of cement may be added for achieving desired slump of concrete.					
		2. Cement provided for various components of the super structure is for estimating purpose only. Actual quantity of cement will be as per approved mix design. Similarly, the provision for coarse and fine aggregates is for estimating purpose and the exact quantity shall be as per the mix design.					
		3. The items like needle and surface vibrators are part of minor T & P which is already covered under the overhead charges. As such these items have not been added seperately in the rate analysis.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.2	1600	A) Supplying ,fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications					
		Unit = 1 MT					
		Taking output = 1 MT					
		a) Material					
		HYSD bars including 5% for laps and wastage	MT	1.05	52915.23	55560.99	
		Binding wire	Kg	8.00	87.00	696.00	
		b) Labour for cutting, bending, tying and placing in position					
		Mate	day	0.44	582.53	256.31	
		Blacksmith	day	3.00	635.48	1906.45	
		Mazdoor	day	8.00	529.57	4236.56	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		62657.00			

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
	CHAPTER-1		
	CARRIAGE OF MATERIALS		
1.1	Loading and unloading of stone boulder / stone aggregates / sand / kanker / moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)	cum	148.00
1.2	Loading and Unloading of Boulders by Manual Means	cum	282.00
1.3	Loading and Unloading of Cement or Steel by Manual Means and stacking.	tonne	398.00
1.4	Cost of Haulage Excluding Loading and Unloading		
(i)	Surfaced Road	tonne.km	8.90
(ii)	Unsurfaced Gravelled Road	tonne.km	10.70
(iii)	Katcha Track and Track in river bed / nallah bed and choe bed.	tonne.km	21.40
1.5	Hand Broken Stone Aggregates 63 mm nominal size (Supply of quarried stone, hand breaking into coarse aggregate 63 mm nominal size (passing 80 mm and retained on 50 mm sieve) and stacking as directed)	cum	2656.00
1.6	Crushing of stone aggregates 13.2 mm nominal size. (Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 13 mm nominal size.)	cum	2144.00
1.7	Crushing of stone aggregates 20 mm nominal size (Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 20 mm nominal size.)	cum	1819.00
1.8	Crushing of stone aggregates 40 mm nominal size (Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 40 mm nominal size.)	cum	1535.00
	CHAPTER-2		
	SITE CLEARANCE		
2.1	Cutting of Trees, including Cutting of Trunks, Branches and Removal (Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 mtrs and earth filling in the depression/pit.)		
(i)	Girth from 300 mm to 600 mm	each	466.00
(ii)	Girth from 600 mm to 900 mm	each	775.00
(iii)	Girth from 900 mm to 1800 mm	each	1594.00
(iv)	Girth above 1800 mm	each	3096.00
2.2	Clearing Grass and Removal of Rubbish	hectare	35273.00
2.3	Clearing and Grubbing Road Land . (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.)		
(i)	By Manual Means:-		
A	In area of light jungle	hectare	106276.00
B	In area of thorny jungle	hectare	142006.00
(ii)	By Mechanical Means		
A	In area of light jungle	hectare	42282.00
B	In area of thorny jungle	hectare	51722.00
2.4	Dismantling of Structures (Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres)		
(i)	Lime /Cement Concrete		
I	By Manual Means		
A	Lime Concrete, cement concrete grade M-10 and below	cum	663.00
B	Cement Concrete Grade M-15 & M-20	cum	804.00
C	Prestressed / Reinforced cement concrete grade M-20 & above	cum	2242.00
II	By Mechanical Means for items No. 202(b) & (c)		
A	Cement Concrete Grade M-15 & M-20	cum	1001.00
B	Prestressed / Reinforced cement concrete grade M-20 & above	cum	1724.00
(ii)	Dismantling Brick / Tile work		
A	In lime mortar	cum	381.00
B	In cement mortar	cum	522.00
C	In mud mortar	cum	324.00
D	Dry brick pitching or brick soling	cum	296.00
(iii)	Dismantling Stone Masonry		

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
A	Rubble stone masonry in lime mortar	cum	437.00
B	Rubble stone masonry in cement mortar.	cum	522.00
C	Rubble Stone Masonry in mud mortar.	cum	381.00
D	Dry rubble masonry	cum	353.00
E	Dismantling stone pitching/ dry stone spalls.	cum	324.00
F	Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials.	cum	381.00
(iv)	Wood work wrought framed and fixed in frames of trusses upto a height of 5 m above plinth level	cum	999.00
(v)	Steel work in all types of sections upto a height of 5 m above plinth level excluding cutting of rivet.		
A	Including dismembering	tonne	2747.00
B	Excluding dismembering.	tonne	2046.00
C	Extra over item No(V) A and(V) B for cutting rivets.	tonne	20.00
(vi)	Scraping of bricks dismantled from brick work including stacking.		
A	In lime/Cement mortar	1000 numbers	2469.00
B	In mud mortar	1000 numbers	882.00
(vii)	Scraping of Stone from dismantled stone masonry		
A	In cement and lime mortar	cum	991.00
B	In Mud mortar	cum	210.00
(viii)	Scarping plaster in lime or cement mortar from brick/ stone masonry	sqm	30.00
(ix)	Removing all type of hume pipes and stacking within a lead of 1000 metres including earthwork and dismantling of masonry works.		
A	Up to 600 mm dia	metre	366.00
B	Above 600 mm to 900 mm dia	metre	495.00
C	Above 900 mm	metre	848.00
2.5	Dismantling of Flexible Pavements (Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately)		
I	By Manual Means		
A	Bituminous courses	cum	1232.00
B	Granular courses	cum	856.00
II	By Mechanical Means		
A	Bituminous course	cum	392.00
2.6	Dismantling of Cement Concrete Pavement (Dismantling of cement concrete pavement by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately)	cum	2619.00
2.7	Dismantling Guard Rails (Dismantling guard rails by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metres, stacking serviceable materials and unserviceable materials separately.)	metre	129.00
2.8	Dismantling Kerb Stone (Dismantling kerb stone by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre)	metre	20.00
2.9	Dismantling Kerb Stone channel (Dismantling kerb stone channel by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre)	metre	30.00
2.10	Dismantling Kilometre Stone (Dismantling of kilometre stone including cutting of earth, foundation and disposal of dismantled material with all lifts and lead upto 1000 m and back filling of pit.)		
A	5th KM stone	each	672.00
B	Ordinary KM Stone	each	398.00
C	Hectometre Stone	each	80.00
2.11	Dismantling of Fencing (Dismantling of barbed wire fencing/ wire mesh fencing including posts, foundation concrete, back filling of pit by manual means including disposal of dismantled material with all lifts and up to a lead of 1000 metres, stacking serviceable material and unserviceable material separately.)	metre	94.00
2.12	Dismantling of CI Water Pipe Line (Dismantling of CI water pipe line 600 mm dia including disposal with all lifts and lead upto 1000 metres and stacking of serviceable material and unserviceable material separately under supervision of concerned department)	metre	244.00
2.13	Removal of Cement Concrete Pipe of Sewer Gutter (Removal of cement concrete pipe of sewer gutter 1500 mm dia under the supervision of concerned department including disposal with all lifts and up to a lead of 1000 metres and stacking of serviceable and unserviceable material separately but excluding earth excavation and dismantling of masonry works.)	metre	324.00
2.14	Removal of Telephone / Electric Poles and Lines (Removal of telephone / Electric poles including excavation and dismantling of foundation concrete and lines under the supervision of concerned department, disposal with all lifts and up to a lead of 1000 metres and stacking the serviceable and unserviceable material separately)	each	314.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
	CHAPTER-3		
	EARTH WORK, EROSION CONTROL AND DRAINAGE		
3.1	Excavation in Soil by Manual Means. (Excavation for roadway in soil using manual means including loading in truck for carrying of cut earth to embankment site with all lifts and lead upto 1000 metres.)	cum	372.00
3.2	Excavation in ordinary rock by manual means (Excavation in ordinary rock using manual means including loading in a truck and carrying of excavated material to embankment site with in all lifts and leads upto 1000 metres)	cum	519.00
3.3	Excavation in Soil with Dozer with lead upto 100 metres (Excavation for road way in soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 metres (average lead 50 metres), including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	cum	138.00
3.4	Excavation in Ordinary Rock with Dozer with lead upto 100 metres (Excavation for roadway in ordinary rock by deploying a dozer, 80 HP including cutting and pushing the cut earth to site of embankment upto a distance of 100 metres (average lead 50 metres), trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	cum	236.00
3.5	Excavation in Hard Rock (requiring blasting) with disposal upto 1000 metres (Excavation for roadway in hard rock (requiring blasting) by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads upto 1000 metres)	cum	372.00
3.6	Excavation in Soil using Hydraulic Excavator CK 90 and Tipplers with disposal upto 1000 metres. (Excavation for roadwork in soil with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tipplers, 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)	cum	92.00
3.7	Excavation in Ordinary Rock using Hydraulic Excavator CK-90 and Tipplers with disposal upto 1000 metres. (Excavation for roadway in ordinary rock with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tipplers, transporting to embankment site within all lifts and lead upto 1000 m, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	cum	111.00
3.8	Excavation in Hard Rock (blasting prohibited) (Excavation for roadway in hard rock (blasting prohibited) with rock breakers including breaking rock, loading in tipplers and disposal within all lifts and lead upto 1000 metres, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)		
A	Mechanised	cum	611.00
B	Manual Method	cum	2127.00
3.9	Excavation in Hard Rock (controlled blasting) with disposal upto 1000 metres (Excavation for roadway in hard rock with controlled blasting by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads upto 1000 metres)	cum	390.00
3.10	Excavation in Marshy Soil (Excavation for roadway in marshy soil with hydraulic excavator 0.9 cum bucket capacity including cutting and loading in tipplers and disposal with in all lifts and lead upto 1000 metres, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	cum	100.00
3.11	Removal of Unserviceable Soil with Disposal upto 1000 metres (Removal of unserviceable soil including excavation, loading and disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid separately as per clause 305.)	cum	93.00
3.12	Pre-splitting of Rock Excavation Slopes (Carrying out excavation in hard rock to achieve a specified slope of the rock face by controlled use of explosives and blasting accessories in properly aligned and spaced drill holes, collection of the excavated rock by a 80 HP dozer, loading in tipper by a front end loader and disposing of the material with all lifts and lead upto 1000 m, all as specified in clause No. 303)	sqm	180.00
3.13	Excavation for Structures (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, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)		
(i)	Ordinary soil		
A	Manual Means (Depth upto 3 m)	cum	564.00
B	Mechanical Means (Depth upto 3 m)	cum	56.00
(ii)	Ordinary rock (not requiring blasting)		
A	Manual Means (Depth upto 3 m)	cum	705.00
B	Mechanical Means	cum	71.00
(iii)	Hard rock (requiring blasting)		
A	Manual Means	cum	1213.00
(iv)	Hard rock (blasting prohibited)		
A	Mechanical Means	cum	1485.00
(v)	Marshy soil		
A	Manual means (upto 3 m depth)	cum	926.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
B	Mechanical Means	cum	329.00
3.14	Scarifying Existing Granular Surface to a Depth of 50 mm by Manual Means (Scarifying the existing granular road surface to a depth of 50 mm and disposal of scarified material within all lifts and leads upto 1000 metres.)	sqm	43.00
3.15	Scarifying existing bituminous surface to a depth of 50 mm by mechanical means (Scarifying the existing bituminous road surface to a depth of 50 mm and disposal of scarified material with in all lifts and lead upto 1000 metres.)	sqm	7.00
3.16	Embankment Construction with Material Obtained from Borrow Pits (Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet requirement of table 300-2)	cum	515.00
3.17	Construction of Embankment with Material Deposited from Roadway Cutting (Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted to meet requirement of table 300-2)	cum	267.00
3.18	Construction of Subgrade and Earthen Shoulders (Construction of subgrade 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)	cum	566.00
3.19	Compacting Original Ground		
Case-I	Compacting original ground supporting subgrade (Loosening of the ground upto a level of 500 mm below the subgrade level, watered, graded and compacted in layers to meet requirement of table 300-2 for subgrade construction.)	cum	88.00
Case-II	:Compacting original ground supporting embankment	cum	55.00
3.20	Stripping and Storing Top Soil (Stripping, storing of top soil by road side at 15 m internal and re-application on embankment slopes, cut slopes and other areas in localities where the available embankment material is not conducive to plant growth)	cum	392.00
3.21	Stripping, storing and re-laying top soil from borrow areas in agriculture fields. (Stripping of top soil from borrow areas located in agriculture fields, storing at a suitable place, spreading and re-laying after taking the borrow earth to maintain fertility of the agricultural field, finishing it to the required levels and satisfaction of the farmer.)	cum	83.00
3.22	Turfing with Sods (Furnishing and laying of the live sods of perennial turf forming grass on embankment slope, verges or other locations shown on the drawing or as directed by the engineer including preparation of ground, fetching of rods and watering)	sqm	128.00
3.23	Seeding and Mulching (Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, mulching material, applying bituminous emulsion at the rate of 0.23 litres per sqm and laying and fixing jute netting, including watering for 3 months all as per clause 308)	sqm	398.00
3.24	Surface Drains in Soil (Construction of unlined surface drains of average cross sectional area 0.40 sqm in soil to specified lines, grades, levels and dimensions to the requirement of clause 301 and 309. Excavated material to be used in embankment within a lead of 50 metres (average lead 25 metres))		
A	Mechanical means	metre	78.00
B	Manual Means	metre	141.00
3.25	Surface Drains in Ordinary Rock (Construction of unlined surface drain of average cross sectional area 0.4 sqm in ordinary rock to specified lines, grades, levels and dimensions as per approved design and to the requirement of clause 301 to 309. Excavated material to be used in embankment at site.)		
A	Mechanical Means	metre	159.00
B	Manual Means	metre	212.00
3.26	Surface Drains in Hard Rock (Rate per metre may be worked out based on quantity of hard rock as per design.)	metre	
3.27	Sub Surface Drains with Perforated Pipe (Construction of subsurface drain with perforated pipe of 100 mm internal diameter of metal/ asbestos cement/ cement concrete/PVC, closely jointed, perforations ranging from 3 mm to 6 mm depending upon size of material surrounding the pipe, with 150 mm bedding below the pipe and 300 mm cushion above the pipe, cross section of excavation 450 x 550 mm. Excavated material to be utilised in roadway at site)		4277.00
3.28	Aggregate Sub- Surface Drains (Construction of aggregate sub surface drain 300 mm x 450 mm with aggregates conforming to table 300-4, excavated material to be utilised in roadway)	metre	2218.00
3.29	Underground Drain at Edge of Pavement (Construction of an underground drain 1 m x 1 m (inside dimensions) lined with RCC-20 cm thick and covered with RCC slab 10 cm in thickness on urban roads)	metre	5053.00
3.30	Preparation and Surface Treatment of formation. (Preparation and surface treatment of formation by removing mud and slurry, watering to the extent needed to maintain the desired moisture content, trimming to the required line, grade, profile and rolling with 8-10 tonne smooth wheeled roller, complete as per clause 310.)	sqm	6.40
3.31	Construction of Rock fill Embankment (Construction of rock fill embankment with broken hard rock fragments of size not exceeding 300 mm laid in layers not exceeding 500 mm thick including filling of surface voids with stone spalls, blinding top layer with granular material, rolled with vibratory road roller, all complete as per clause 313)	cum	143.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
3.32	Excavation in Hill Area in Soil by Mechanical Means (Excavation in soil in hilly area by mechanical means including cutting and trimming of side slopes and disposing of excavated earth with all lifts and lead upto 1000 metres)	cum	193.00
3.33	Excavation in Hilly Area in Ordinary Rock by Mechanical Means not Requiring Blasting. (Excavation in hilly area in ordinary rock not requiring ballasting by mechanical means including cutting and trimming of slopes and disposal of cut material with all lift and lead upto 1000 metres)	cum	273.00
3.34	Excavation in Hilly Areas in Hard Rock Requiring Blasting (Excavation in hilly areas in hard rock requiring blasting, by mechanical means including trimming of slopes and disposal of cut material with all lifts and lead upto 1000 metres.)	cum	435.00
3.35	Construction of subgrade after improving with lime as stabiliser with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet the requirement of Table 300-2.	cum	1320.00
3.36	Embankment Construction with Fly ash/Pond ash available from coal or lignite burning Thermal Plants as waste material. (Construction of embankment with fly ash conforming to table 1 of IRC: SP: 58 - 2001 obtained from coal or lignite burning thermal power stations as waste material, spread and compacted in layer of 200mm thickness each at OMC, all as specified in IRC: SP: 58-2001 and as per approved plans.)	cum	4149.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
	CHAPTER-4		
	SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS		
4.1	Granular Sub-base with Close Graded Material (Table:- 400-1)		
A	Plant Mix Method (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)		
(i)	for grading- I Material	cum	3847.00
(ii)	for grading- II Material	cum	3917.00
(iii)	for grading-III Material	cum	3938.00
B	By Mix in Place Method (Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401)		
(i)	for grading- I Material	cum	3117.00
(ii)	for grading- II Material	cum	3181.00
(iii)	for grading-III Material	cum	3200.00
4.2	Granular Sub-Base with Coarse Graded Material (Table:- 400- 2) (Construction of granular sub-base by providing coarse graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401)		
(i)	for grading- I Material	cum	3363.00
(ii)	for grading- II Material	cum	3421.00
(iii)	for grading-III Material	cum	3461.00
4.3	Lime Stabilisation for Improving Subgrade (Laying and spreading available soil in the subgrade on a prepared surface, pulverising, mixing the spread soil in place with rotavator with 3 % slaked lime having minimum content of 70% of CaO, grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade)		
A	By Mechanical Means	cum	1220.00
B	By Manual Means	cum	1308.00
4.4	Lime Treated Soil for Sub- Base (Providing, laying and spreading soil on a prepared sub grade, pulverising, mixing the spread soil in place with rotavator with 3 % slaked lime with minimum content of 70% of CaO, grading with motor grader and compacting with the road roller at OMC to achieve at least 98% of the max dry density to form a layer of sub base.)	cum	1490.00
4.5	Cement Treated Soil Sub Base/ Base (Providing, laying and spreading soil on a prepared sub grade, pulverising, adding the designed quantity of cement to the spread soil, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.)	cum	1230.00
4.6	Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4 in Sub base/ Base (Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.)		
(i)	For Sub-Base course	cum	3980.00
(ii)	For Base course	cum	4012.00
4.7	Making 50 mm x 50 mm Furrows (Making 50 mm x 50 mm furrows, 25mm deep, 450 to the center line of the road and at one metre interval in the existing thin bituminous wearing coarse including sweeping and disposal of excavated material within 1000 metres lead)	sqm	7.20
4.8	Inverted Choke (Construction of inverted choke by providing, laying, spreading and compacting screening B type/ coarse sand of specified grade in uniform layer on a prepared surface with motor grader and compacting with power roller etc)	cum	10905.00
4.9	Water Bound Macadam (Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.)		
A	By Manual Means		
(i)	Grading- I (Using Screening Crushable type such as Moorum or Gravel)		
(a)	Using Screening Crushable type such as Moorum or Gravel	cum	4237.00
(b)	Using Screening Type-A (13.2mm Agg.)	cum	4590.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
(ii)	Grading- II (Using Screening Crushable type such as Moorum or Gravel)		
(a)	Using Screening Crushable type such as Moorum or Gravel	cum	4275.00
(b)	Using Screening Type-A (13.2mm Agg.)	cum	4337.00
(c)	Using Screening Type-B (11.2mm Agg.)	cum	4560.00
(iii)	Grading- III (Using Screening Crushable type such as Moorum or Gravel)		
(a)	Using Screening Crushable type such as Moorum or Gravel	cum	4365.00
(b)	Using Screening Type-B (11.2mm Agg.)	cum	4650.00
B	By Mechanical Means:		
(i)	Grading- I (Using Screening Crushable type such as Moorum or Gravel)		
(a)	Using Screening Crushable type such as Moorum or Gravel	cum	3836.00
(b)	Using Screening Type-A (13.2mm Agg.)	cum	4188.00
(ii)	Grading- II (Using Screening Crushable type such as Moorum or Gravel)		
(a)	Using Screening Crushable type such as Moorum or Gravel	cum	3873.00
(b)	Using Screening Type-A (13.2mm Agg.)	cum	3936.00
(c)	Using Screening Type-B (11.2mm Agg.)	cum	4159.00
(iii)	Grading- III (Using Screening Crushable type such as Moorum or Gravel)		
(a)	Using Screening Crushable type such as Moorum or Gravel	cum	3963.00
(b)	Using Screening Type-B (11.2mm Agg.)	cum	4248.00
4.10	Crushed Cement Concrete Sub-base / Base (Breaking and crushing of material obtained by breaking damaged cement concrete slabs to size range not exceeding 75 mm as specified in table 400.7 transporting the aggregates obtained from breaking of cement concrete slabs at a lead of L km., laying and compacting the same as sub base/ base course, constructed as WBM to clause 404 except the use of screening or binding Material.)	cum	712.00
4.11	Penetration Coat Over Top Layer of Crushed Cement Concrete Base (Spraying of bitumen over cleaned dry surface of crushed cement concrete base at the rate of 25 kg per 10 sqm by a bitumen pressure distributor, spreading of key aggregates at the rate of 0.13 cum per 10 sqm by a mechanical gritter and rolling the surface as per clause 506.3.8)	sqm	49.00
4.12	Wet Mix Macadam (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.)	cum	4429.00
4.13	Construction of Median and Island with Soil Taken from Roadway Cutting (Construction of Median and Island above road level 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)	cum	513.00
4.14	Construction of Median and Island with Soil Taken from Borrow Areas (Construction of median and Island above road level with approved material brought from borrow pits, spread, sloped and compacted as per clause 407)	cum	802.00
4.15	Construction of Shoulders (A. Earthen Shoulders)		
4.16	Footpaths and Separators (Construction of footpath/separator by providing a 150 mm compacted granular sub base as per clause 401 and 25 mm thick cement concrete grade M15, over laid with precast concrete tiles in cement mortar 1:3 including provision of all drainage arrangements but excluding kerb channel..)	sqm	2433.00
4.17	Crusher Run Macadam Base (Providing crushed stone aggregate, depositing on a prepared surface by hauling vehicles, spreading and mixing with a motor grader, watering and compacting with a vibratory roller to clause 410 to form a layer of sub-base/Base)		
A	By Mix in Place Method		
(i)	For 53 mm maximum size	cum	3815.00
(ii)	For 45 mm maximum size	cum	4022.00
B	By Mixing Plant :		
(i)	For 53 mm maximum size	cum	4141.00
(ii)	For 45 mm maximum size	cum	4401.00
4.18	Lime, Fly ash stabilised soil sub-base (Construction of Sub-base using lime - fly ash admixture with granular soil, free from organic matter/ deleterious material or clayey silts and low plasticity clays having PI between 5 and 20 and liquid limit less than 25 and commercial dry lime, slaked at site or pre-slaked with CaO content not less than 50%, fly ash to conform to gradation as per clause 4.3 of IRC: 88-1984, lime + fly ash content ranging between 10 to 30%, the minimum un-confined compressive strength and CBR value after 28 days curing and 4 days soaking to be 7.5kg/sq, cm and 25% respectively, all as specified in IRC: 88-1984.)	cum	2060.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
	CHAPTER-5		
	BASES AND SURFACE COURSES (BITUMINOUS)		
5.1	Prime coat (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.)	sqm	53.80
5.2	Tack coat Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.	sqm	19.20
5.3	Bituminous Macadam (Providing and laying bituminous macadam with 100-120 TPH hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading premixed with bituminous binder, transported to site, laid over a previously prepared surface with paver finisher to the required grade, level and alignment and rolled as per clauses 501.6 and 501.7 to achieve the desired compaction)		
(i)	for Grading I (40 mm nominal size)	cum	9658.00
(ii)	for Grading II (19 mm nominal size)	cum	9596.00
5.4	Bituminous Penetration Macadam (Construction of penetration macadam over prepared Base by providing a layer of compacted crushed coarse aggregate using chips spreader with alternate applications of bituminous binder and key aggregates and rolling with a smooth wheeled steel roller 8-10 tonne capacity to achieve the desired degree of compaction)		
A	50 mm thick	sqm	470.00
B	75 mm thick	sqm	662.00
5.5	Built-Up-Spray Grout (Providing, laying and rolling of built-up-spray grout layer over prepared base consisting of a two layer composite construction of compacted crushed coarse aggregates using motor grader for aggregates. Key stone chips spreader may be used with application of bituminous binder after each layer, and with key aggregates placed on top of the second layer to serve as a Base conforming to the line, grades and cross-section specified, the compacted layer thickness being 75 mm)	sqm	466.00
5.6	Dense Graded Bituminous Macadam (Providing and laying dense 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% by weight of total mix 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. 507 complete in all respects.)		
(i)	for Grading I (40 mm nominal size)	cum	11784.00
(ii)	for Grading II (19 mm nominal size)	cum	11779.00
5.7	Semi - Dense Bituminous Concrete (Providing and laying semi dense bituminous concrete 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 @ 4.5 to 5 % 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. 508 complete in all respects)		
(i)	for Grading I (13 mm nominal size)	cum	11943.00
(ii)	for Grading II (10 mm nominal size)	cum	12548.00
5.8	Bituminous Concrete (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 % 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)		
(i)	for Grading-I (13 mm nominal size)	cum	12954.00
(ii)	for Grading-II (10 mm nominal size)	cum	12792.00
5.9	Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller)		
Case - I	:-19 mm nominal chipping size	sqm	116.00
Case - II	13 mm nominal size chipping	sqm	88.00
5.10	Open - Graded Premix Surfacing (Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen or cut-back or emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 tonne capacity, finished to required level and grades.)		
(i)	Case - I: Mechanical method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour .	sqm	184.00
(ii)	Case - II: Open-Graded Premix Surfacing using cationic Bitumen Emulsion	sqm	230.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
5.11	Close Graded Premix Surfacing/Mixed Seal Surfacing (Mechanical means using HMP of appropriate capacity not less than 75 tonnes/hour. Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.09 mm (Type-a) or 13.2 mm to 0.09 mm (Type-b) aggregates using penetration grade bitumen to the required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a Smooth wheeled roller 8-10 tonne capacity, and finishing to required level and grade.)	sqm	223.00
5.12	Seal Coat (Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A and B seal coats)		
(i)	Case - I : Type A	sqm	82.00
(ii)	Case - II : Type B (Providing and laying of premix sand seal coat with HMP of appropriate capacity not less than 75 tonnes/ hours using crushed stone chipping 6.7 mm size and penetration bitumen of suitable grade.)	sqm	63.00
5.13	Supply of Stone Aggregates for Pavement Courses (Supply of stone aggregates from approved sources confirming to the physical requirement, specified in the respective specified clauses, including royalties, fees rents, collection, transportation, stacking and testing and measured in cum as per clause 514.5 Competitive market rates to be ascertained. Alternatively, rates for stone crushing given in chapter 1 may be adopted, if found economical. In case for supply of aggregates at site are not available, nearest crusher site may be ascertained. Loading and un-loading charges and cost of carriage may be added to these rates to arrive at the cost at site.)	cum	
5.14	Mastic Asphalt (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 fine-grained 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 not less than 1000C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.)	sqm	982.00
5.15	Slurry Seal Providing and laying slurry seal consisting of a mixture of fine aggregates, portland cement filler, bituminous emulsion and water on a road surface including cleaning of surface, mixing of slurry seal in a suitable mobile plant, laying and compacting to provide even riding surface)		
(i)	5 mm thickness	sqm	125.00
(ii)	3 mm thickness	sqm	85.00
(iii)	1.5 mm thickness	sqm	51.00
5.16	Recycling of Bituminous Pavement with Central Recycling Plant (Recycling pavement by cold milling of existing bituminous layers, planning the surface after cold milling, reclaiming excavated material to the extent of 30 % of the required quantity, hauling and stock piling the reclaimed material near the central recycling plant after carrying out necessary checks and evaluation, adding fresh material including rejuvenators as required, mixing in a hot mix plant, transporting and laying at site and compacting to the required grade, level and thickness, all as specified in clause 517.)	cum	9023.00
5.17	Fog Spray	sqm	64.00
added	1.In case it is decided by the engineer to blind the fog spray, the following may be added	sqm	9.70
5.18	Bituminous Cold Mix (Including Gravel Emulsion) (Providing, laying and rolling of bituminous cold mix on prepared base consisting of a mixture of unheated mineral aggregate and emulsified or cutback bitumen, including mixing in a plant of suitable type and capacity, transporting, laying, compacting and finishing to specified grades and levels.)		
(i)	Using bitumen emulsion and 9.5 mm or 13.2 mm nominal size aggregate	cum	20029.00
(ii)	Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate	cum	20138.00
(iii)	Using cutback bitumen and 9.5 mm or 13.2 mm nominal size aggregate	cum	11474.00
(iv)	Using cutback bitumen and 19 mm or 26.5 mm nominal size aggregate	cum	11581.00
5.19	Sand Asphalt Base Course (Providing, laying and rolling sand-asphalt base course composed of sand, mineral filler and bituminous binder on a prepared sub-grade or sub-base to the lines, levels, grades and cross sections as per the drawings including mixing in a plant of suitable type and capacity, transporting, laying, compacting and finishing.)	cum	20214.00
5.20	Modified Binder (Supply of modified binder produced by mixing bitumen with modifier such as natural rubber or crumb rubber or any other polymer found compatible with bitumen and which allows properties given in clause 521.3 and IRC: SP: 53 blending of modifier with bitumen to be done either at the refinery or at the site plant capable of producing the modified binder to be delivered in drums which shall be agitated in melted condition using suitable device before use to ensure uniform dispersion.)	tonne	
5.21	Crack Prevention Courses		
(i)	Stress Absorbing Membrane (SAM) crack width less than 6 mm (Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width below 6 mm after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 9 kg per 10 sqm and spreading 5.6 mm crushed stone aggregates @ 0.11 cum per 10 sqm with hydraulic chip spreader, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902.)	sqm	81.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
(ii)	Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm (Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width 6 to 9 mm after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 11 kg per 10 sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 cum per 10 sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902.)	sqm	91.00
(iii)	Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 % (Providing and laying a single coat of a stress absorbing membrane over a cracked road surface, with crack width above 9 mm and cracked area above 50 % after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 15 kg per 10 sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 cum per 10 sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902.)	sqm	118.00
(iv)	Case - IV : Bitumen Impregnated Geotextile (Providing and laying a bitumen impregnated geotextile layer after cleaning the road surface, geotextile conforming to requirements of clause 704.3, laid over a tack coat with 1.05 kg per sqm of paving grade bitumen 80 - 100 penetration and constructed to the requirement of clause 704.4.5)	sqm	206.00
5.22	Recipe Cold Mix (Providing and laying of premix of crushed stone aggregates and emulsion binder, mixed in a batch type cold mixing plant, laid over prepared surface, by paver finisher, rolled with a pneumatic tired roller initially and finished with a smooth steel wheel roller, all as per clause 519.3)		
(i)	75 mm thickness	cum	12793.00
(ii)	40 mm thickness	cum	17652.00
(iii)	25 mm thickness	cum	20208.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
	CHAPTER-6		
	CEMENT CONCRETE PAVEMENTS		
6.1	Dry Lean Cement Concrete Sub- base (Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 150 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver with electronic sensor, compacting with 8-10 tonnes vibratory roller, finishing and curing.)	cum	8797.00
6.2	Cement Concrete Pavement (Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing)	cum	13951.00
6.3	Rolled Cement Concrete Base (Construction of rolled cement concrete base course with coarse and fine aggregate conforming to IS:383, the size of coarse aggregate not exceeding 25 mm with minimum, aggregate cement ratio 15:1 and minimum cement content of 200 kg/cum, aggregate gradation to be as per table 600-4 after blending, mixing in batching plant at optimum moisture content, transporting to site, laying with a paver with electronic sensor, compacting with 8-10 tonnes smooth wheeled vibratory roller to achieve, the designed flexural strength, finishing and curing.)	cum	9258.00
6.4	Transition section between rigid and flexible pavement (Due to change in the properties of materials and type of construction, a gradual changeover from rigid pavement to flexible pavement is desirable to avoid any damage at the butting joint. After provision of an expansion joint in the cement concrete slab, the thickness of slab should be tapered to 10 cm over a length of 3 m towards the flexible pavement. The deficiency of thickness caused due to tapering of the slab should be made up by the asphaltic layers.)		
6.5	Construction of Base/Sub-base of pavement with lean concrete - fly ash. (Construction of Base/sub-base using cement, sand, fly ash and coarse aggregates proportioned as per table 4 of IRC: 74/1979 and with water content ratio, slump and compressive strength as defined in the said table, mix prepared in a batching and mixing plant and compacted with a vibratory roller 8-10 tonnes capacity within the time limit laid down vide clause 7.6.3 of IRC: 74-1979, construction joints properly formed at the end of day's work, cured for 14 days, all as specified in IRC: 74-1979 and as per approved plans.)	cum	6911.00
6.6	Cement - Fly ash concrete pavement. (Construction reinforced-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, replacing cement by fly ash to the extent of 15% and sand by 10%, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing)	cum	15983.00
	CHAPTER-7		
	GEOSYNTHETICS AND REINFORCED EARTH		
7.1	Sub- Surface Drain with Geotextiles (Construction of sub surface drain 200 mm dia using geotextiles treated with carbon black with physical properties as given in clause 702.2.3 formed in to a stable network and a planar geocomposite structure, joints wrapped with geotextile to prevent ingress of soil, all as per clause 702 and approved drawings including excavation and backfilling)	metre	1107.00
7.2	Narrow Filter Sub- Surface Drain (Construction of a narrow filter sub- surface drain consisting of porous or perforated pipe laid in narrow trench surrounded by a geotextile filter fabric, with a minimum of 450 mm overlap of fabric and installed as per clause 702.3 and 309.3.5 including excavation and backfilling)	metre	1220.00
7.3	Laying Paving Fabric Beneath a Pavement Overlay (Providing and laying paving fabric with physical requirements as per table 704-2 over a tack coat of paving grade Bitumen 80-100 penetration, laid at the rate of 1 kg per sqm over thoroughly cleaned and repaired surface to provide a water resistant membrane and crack retarding layer. Paving fabric to be free of wrinkling and folding and to be laid before cooling of tack coat, brooming and rolling of surface with pneumatic roller to maximise paving fabric contact with pavement surface)	sqm	205.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
7.4	Laying Boulder Apron in Crates of Synthetic Geogrids (Providing, preparing and laying of geogrid crated apron 1 m x 5 m, 600 mm thick including excavation and backfilling with baffles at 1 metre interval, made with geogrids having characteristics as per clause 704.2, joining sides with connectors/ring staples, top corners to be tie tensioned, placing of suitable cross interval ties in layers of 300 mm connecting opposite side with lateral braces and tied with polymer braids to avoid bulging, constructed as per clause 704.3. filled with stone with minimum size of 200 mm and specific gravity not less than 2.65, packed with stone spalls, keyed to the foundation recess in case of sloping ground and laid over a layer of geotextile to prevent migration of fines, all as per clause 704 and laid as per clause 2503.3 and approved design.)	cum	1749.00
7.5	Reinforced Earth Retaining Wall (Reinforced earth retaining walls have four main components as under: a) Excavation for foundation, foundation concrete and cement concrete grooved seating in the foundation for facing elements (facia material). b) Facia material and its placement. c) Assembling, joining with facing elements and laying of the reinforcing elements. d) Earthfill with granular material which is to be retained by the wall.)		
(i)	Facing elements of RCC	sqm	2064.00
(ii)	Assembling, joining and laying of reinforcing elements.		
A	With reinforcing element of steel / Aluminium strips / polymeric strips.		
Type 1	1.Galvanised carbon steel strips	metre	332.00
Type 2	2.Copper Strips	metre	668.00
Type 3	3.Aluminium Strips	metre	754.00
Type 4	4.Stainless steel strips	metre	761.00
Type 5	5.Glass reinforced polymer/fibre reinforced polymer/polymeric strips	metre	701.00
B	With reinforcing elements of synthetic geogrids	sqm	741.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
	CHAPTER-8		
	TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES		
8.1	Cast in Situ Cement Concrete M20 kerb (Construction of cement concrete kerb with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M-10 grade foundation 150 mm thick, foundation having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408)		
A	Using Concrete Mixer	metre	757.00
B	Using Concrete Batching and Mixing Plant	metre	731.00
8.2	Cast in Situ Cement Concrete M 20 Kerb with Channel (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)		
A	Using Concrete Mixer	metre	1366.00
B	Using Concrete Batching and Mixing Plant	metre	946.00
8.3	Printing new letter and figures of any shade (Printing new letter and figures of any shade with synthetic enamel paint black or any other approved colour to give an even shade)		
(i)	Hindi (Matras commas and the like not to be measured and paid for Half letter shall be counted as half)	cm height per letter	1.80
(ii)	English and Roman	cm height per letter	1.10
8.4	Retro- reflectorised Traffic signs (Providing and fixing of retro- reflectorised cautionary, mandatory and informatory sign as per IRC :67 made of encapsulated lens type reflective 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)		
(i)	90 cm equilateral triangle	each	6520.00
(ii)	60 cm equilateral triangle	each	4755.00
(iii)	60 cm circular	each	5910.00
(iv)	80 mm x 60 mm rectangular	each	7702.00
(v)	60 cm x 45 cm rectangular	each	5792.00
(vi)	60 cm x 60 cm square	each	6611.00
(vii)	90 cm high octagon	each	9449.00
8.5	Direction and Place Identification signs upto 0.9 sqm size board. (Providing and erecting direction and place identification retro-reflectorised sign as per IRC:67 made of encapsulated lens type reflective 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)	sqm	12730.00
8.6	Direction and Place Identification signs with size more than 0.9 sqm size board. (Providing and erecting direction and place identification retro- reflectorised sign as per IRC :67 made of encapsulated lens type reflective 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)	sqm	22311.00
8.7	Overhead Signs (Providing and erecting overhead signs with a corrosion resistant aluminium alloy sheet reflectorised with high intensity retro-reflective sheeting of encapsulated lense type with vertical and lateral clearance given in clause 802.2 and 802.3 and installed as per clause 802.7 over a designed support system of aluminium alloy or galvanised steel trestles and trusses of sections and type as per structural design requirements and approved plans)		
A	Truss and Vertical Support	tonne	113899.00
B	Aluminium alloy plate for over head sign	tonne	5674.00
8.8	Painting Two Coats on New Concrete Surfaces (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	240.00
8.9	Painting on Steel Surfaces (Providing and applying two coats of ready mix paint of approved brand on steel surface after through cleaning of surface to give an even shade)	sqm	149.00
8.10	Painting on Wood Surfaces (Providing and applying two coats of ready mix paint of approved brand on wood surface after through cleaning of surface to give an even shade)	sqm	168.00
8.11	Painting Lines, Dashes, Arrows etc on Roads in Two Coats on New Work (Painting lines, dashes, arrows etc on roads in two coats on new work with ready mixed road marking paint conforming to IS:164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control)		
(i)	Over 10 cm in width	sqm	321.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
(ii)	Up to 10 cm in width	sqm	290.00
8.12	Painting Lines, Dashes, Arrows etc on Roads in Two Coats on Old Work (Painting lines, dashes, arrows etc on roads in two coats on old work with ready mixed road marking paint conforming to IS: 164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control)		
(i)	Over 10 cm in width	sqm	214.00
(ii)	Up to 10 cm in width	sqm	225.00
8.13	Road Marking with Hot Applied Thermoplastic Compound with Reflectorising Glass Beads on Bituminous Surface (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.)	sqm	3638.00
8.14	Kilo Metre Stone (Reinforced cement concrete M15 grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and printing etc)		
(i)	5th kilometre stone (precast)	each	7213.00
(ii)	Ordinary Kilometer stone (Precast)	each	4490.00
(iii)	Hectometer stone (Precast)	each	1059.00
8.15	Road Delineators (Supplying and installation of delineators (road way indicators, hazard markers, object markers), 80-100 cm high above ground level, painted black and white in 15 cm wide stripes, fitted with 80 x 100 mm rectangular or 75 mm dia circular reflectorised panels at the top, buried or pressed into the ground and confirming to IRC-79 and the drawings.)	each	1345.00
8.16	Boundary pillar (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)	each	1493.00
8.17	G.I Barbed wire Fencing 1.2 metre high (Providing and fixing 1.2 metres high GI barbed wire fencing with 1.8 m angle iron posts 40 mm x 40 mm x 6 mm placed every 3 metres center to center founded in M15 grade cement concrete, 0.6 metre below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 9 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per clause 807)	metre	740.00
8.18	G.I Barbed wire Fencing 1.8 metre high (Providing and fixing 1.8 metres high GI barbed wire fencing with 2.4 m angle iron posts 50 mm x 50 mm x 6 mm placed every 3 metres center to center founded in M15 grade cement concrete, 0.6 metre below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 12 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per clause 807)	metre	1086.00
8.19	Fencing with welded steel wire Fabric 75 mm x 50 mm (Suggestive) (Providing 1.20 metre high fencing with angle iron posts 50 mm x 50 mm x 6 mm at 3 metre center to center with 0.40 metre embedded in M15 grade cement concrete, corner, end and every 10th post to be strutted, provided with welded steel wire fabric of 75 mm x 50 mm mesh or 75 mm x 25 mm mesh and fixed to iron posts by flat iron 50 x 5 mm and bolts etc. complete in all respects.)	metre	1126.00
8.20	Tubular Steel Railing on Medium Weight steel channel (ISMC series) 100 mm x 50 mm (Providing, fixing and erecting 50 mm dia steel pipe railing in 3 rows duly painted on medium weight steel channels (ISMC series) 100 mm x 50 mm, 1.2 metres high above ground, 2 m centre to centre, complete as per approved drawings)	metre	2802.00
8.21	Tubular Steel Railing on Precast RCC posts, 1.2 m high above ground level (Providing, fencing and erecting 50 mm dia painted steel pipe railing in 3 rows on precast M20 grade RCC vertical posts 1.8 metres high (1.2 m above GL) with 3 holes 50 mm dia for pipe, fixed 2 metres centre to, complete as per approved drawing)	metre	2174.00
8.22	Reinforced Cement Concrete Crash Barrier (Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-20 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)		
(i)	M 20 grade concrete	metre	5446.00
8.23	Metal Beam Crash Barrier		
A	Type - A, "W" : Metal Beam Crash Barrier (Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fittings to be galvanised by hot dip process; all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 810)	metre	4108.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
B	Type - B, "THRIE" : Metal Beam Crash Barrier (Providing and erecting a "Thrie" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 85 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 2 m high with 1.15 m below ground level, all steel parts and fittings to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a space of channel section 150 x 75 x 5 mm, 546 mm long complete as per clause 810)	metre	5635.00
8.24	Road Traffic Signals electrically operated (Since it is a ready made item commercially produced and erected by specialised firm in the electrical and electronic field, rate may be taken based on market enquiry from firms specialised in this field and ISI certified for the approved design and drawing.)		
8.25	Flexible Crash Barrier, Wire Rope Safety Barrier (Providing and erecting a wire rope safety barrier with vertical posts of medium weight RS Joist (ISMB series) 100 mm x 75 mm (11.50 kg/m), 1.50 m long 0.85 m above ground and 0.65 m below ground level, split at the bottom for better grip, embedded in M 15 grade cement concrete 450 x 450 x 450 mm, 1.50 m center to center and with 4 horizontal steel wire rope 40 mm dia and anchored at terminal posts 15 m apart. Terminal post to be embedded in M 15 grade cement concrete foundation 2400 x 450 x 900 mm (depth), strengthened by a strut of RS joist 100 x 75 mm, 2 m long at 450 inclination and a tie 100 x 8 mm, 1.50 m long at the bottom, all embedded in foundation concrete as per approved design and drawing, rate excluding excavation and cement concrete.)	metre	5130.00
8.26	Anti - Glare Devices in Median		
A	Plantation (Plantation of shrubs and plants of approved species in the median. apart from cutting off glare from vehicle coming from opposite direction, these plants provide a pleasant environment and are eco-friendly. The rate for this item is available in the chapter 11 on horticulture.)		
B	Anti - Glare Screen with 25 mm steel pipe framework fixed with circular and rectangular vans (Providing and erecting an anti - glare screen with 25 mm dia vertical pipes fabricated and framed in the form of panels of one metre length and 1.75 mtr height fixed with circular vane 250 mm dia at top and rectangular vane 600 x 300 mm at the middle, made out of steel sheet of 3 mm thickness, end vertical pipes of the panel made larger for embedding in foundation concrete, applying 2 coats of paint on all exposed surfaces, all as per approved design and drawings.)	metre	3537.00
C	Anti - Glare Screen with Rectangular Vane of MS sheet (Providing and erecting anti - glare screen with rectangular vanes of size 750 x 500 mm made from MS sheet, 3 mm thick and fixed on MS angle 50 x 50 x 6 mm at an angle of 450 to the direction of flow of traffic, 1.5 m center to center, top edge of the screen 1.75 m above ground level, vertical post firmly embedded in cement concrete foundation 0.60 m below ground level, applying 2 coats of paint on exposed faces, all complete as per approved design and drawings)	metre	1268.00
8.27	Street Lighting (Providing and erecting street light mounted on a steel circular hollow pole of standard specifications for street lighting, 9 m high spaced 40 m apart, 1.8 m overhang on both sides if fixed in the median and on one side if fixed on the footpath, fitted with sodium vapour lamp and fixed firmly in concrete foundation.)		
(i)	For Fixing in Median	each	69369.00
(ii)	For fixing in Footpath	each	69113.00
8.28	Lighting on Bridges (Providing and fixing lighting on bridges, mounted on steel hollow circular poles of standard specifications, 5 m high fixed on parapets with cement concrete, 20 m apart and fitted with sodium vapour lamp)	each	36962.00
8.29	Cable Duct Across the Road (Providing and laying of a reinforced cement concrete pipe duct, 300 mm dia, across the road (new construction), extending from drain to drain in cuts and toe of slope to toe of slope in fills, constructing head walls at both ends, providing a minimum fill of granular material over top and sides of RCC pipe as per IRC:98-1997, bedded on a 0.3 m thick layer of granular material free of rock pieces, outer to outer distance of pipe at least half dia of pipe subject to minimum 450 mm in case of double and triple row ducts, joints to be made leak proof, invert level of duct to be above higher than ground level to prevent entry of water and dirt, all as per IRC: 98 - 1997 and approved drawings.)		
(i)	Single Row for one utility service	metre	12674.00
(ii)	Double Row for two utility services	metre	24657.00
(iii)	Triple Row for three utility services	metre	36677.00
8.30	Highway Patrolling and Traffic Aid Post (It is proposed to locate one Traffic Aid Post every 50-60 km of the highway.)		
8.31	Items related to under pass/ subway/ overhead bridge/ overhead foot bridge (The items involved for underpass/ subway/ overhead bridge/ overhead foot bridge are earthwork, plain cement concrete, plastering, painting, information sign etc. The rates for these items are available in respective chapters which can be adopted for the quantities derived from the approved designs and drawings)		
8.32	Traffic Control System and Communication system (Providing a traffic control centre and communication system including telecommunication facilities and related accessories, CCTV, radar, vehicle detection camera, central computer system These are specialised item of telecommunication system and are the commercial products. The designer is required to contact the manufacturers to ascertain market prices. In case of civil works required to be executed for these installations, pricing may be done as per rates in relevant chapters for quantities derived approved design and drawing.)		

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
8.33	Gantry Mounted Variable Message Sign board (Providing and erecting gantry mounted variable message sign board electronically operated capable of flashing the desired message over a designed support system of aluminium alloy or galvanised steel, erected as per approved design and drawings and with lateral clearance as per clause 802.3)		
(i)	Gantry Support System	tonne	109137.00
(ii)	Message Display (Message display board 6 sqm electronically operated with complete electronic fittings for flashing the pre-determined messages.)		
8.34	Traffic Impact Attenuators at Abutments and Piers		
A	With Scrap Tyres (Provision and installation of traffic attenuators at abutment/pier of flyovers bridges using scrap tyres of size 100 x 20 retrieved from trucks laid in 2 rows and 4 tiers, one above the other and tied with 20 mm wire rope as per approved design and drawings.)	sqm	4943.00
B	Using Plastic/Steel Barrel, Filled with Sand (Provision and installation of traffic impact attenuator at abutment/pier of flyovers bridges using plastic/steel barrels 0.60 m dia and 1.0 m in height, filled with sand in three rows and tied with 20 mm steel wire rope as per approved design and drawings)	sqm	1599.00
C	With HI - DRO cell Sandwich (Patented) ((In this patented HI - DRO cell system, water gets discharged from plastic tubes on impact over a pre-determined time, thus absorbing the energy))	sqm	6300.00
8.35	Road Markers/Road Stud with Lense Reflector (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)	each	2469.00
8.36	Traffic Cone (Provision of red fluorescent with white reflective sleeve traffic cone made of low density polyethylene (LDPE) material with a square base of 390 x 390 x 35 mm and a height of 770 mm, 4 kg in weight, placed at 1.5 m interval, all as per BS 873)	each	1585.00
8.37	Roadside Amenities		
A	Rest Areas (Providing plainly furnished accommodation for rest rooms, dormitories, restaurants, stalls, shops, petrol pump, telephone booth, first aid room, traffic aid post, police assistance booth, including electricity, toilet and sewerage system Pricing may be done based on current plinth area rates approved by PWD/CPWD/MES for a particular zone. Area is required to be assessed for specific location as per actual site conditions)		
B	Parking areas and Bus Laybys for Trucks, Buses and Light vehicles (Pricing of parking areas may be done for the quantities of various items based on the approved dimensions and pavement design for a particular terrain and soil. Rates for items may be from respective chapters.)		
C	Lawn (Providing a lawn planted with grass and its maintenance)		
8.38	Rumble Strips (Provision of 15 nos rumble strips covered with premix bituminous carpet, 15-20 mm high at center, 250 mm wide placed at 1 m center to center at approved locations to control speed, marked with white strips of road marking paint.)	sqm	
8.39	Policeman Umbrella (Provision of a 2 m high (floor to roof) umbrella for traffic policeman at road crossings, where necessary, installed on a raised platform, built on a central support of a steel pipe 100 mm dia, roof made of 25 mm dia steel pipe to provide covered area of 3 sqm, roofed with CGI sheets, all steel parts to be given 2 coats of paint)	each	
8.40	High Mast Pole Lighting at Interchanges and Flyovers (Providing and erecting a high mast pole lighting with 30 m high hot dip galvanised mast designed to withstand forces exerted with wind speeds of 180 km per hour with 3 seconds gust, as per IS:875 (Part 3) - 1978, fitted with a base flange, door at the base of mast with heavy duty internal lock, lantern carriage, suitable winching arrangement for safe working load of 750 kg and high powered electrically driven power tools for raising and lowering of lantern carriage, flexible 8 core electric cable, lightening conductor, earthing terminal, and fixing 2 nos aviation obstruction lights on top of the mast, all complete as per approved design and drawings This is a specialised work and is generally done by firms who specialise in such jobs. The detailed designs and estimates are submitted by the firms alongwith their tender for checks by the Department. The cost of this work is required to be worked out based on approved design, drawings and estimate of the lowest tender. A separate contract for this work is concluded as the contractors for road and bridge works generally do not undertake such jobs.)		
8.41	Toll Plaza (The construction, operation and maintenance of Toll Plaza can be broken into separate items of work as under based on the approved design and drawings:-)		
8.42	Safety Devices and signs in Construction Zones (Provision and fixing of traffic signs for limited period at suitable locations in construction zone comprising of warning zone, approach transition zone, working zone and terminal transition zone with a minimum distance of 60 cm from the edge of the kerb in case of kerbed roads and 2 to 3 m from the edge of the carriageway in case of un-kerbed roads, the bottom edge of the lowest sign plate to be not less than 2 m above the road level, fixed on 60 mm x 60 mm x 6 mm angle iron post, founded and installed as per approved design and drawings, removed and disposed of after completion of construction work, all as per IRC:SP:55-2001)		
8.43	Portable Barricade in Construction Zone (Installation of a steel portable barricade with horizontal rail 300 mm wide, 2.5 m in length fitted on a 'A' frame made with 45 x 45 x 5 mm angle iron section, 1.5 m in height, horizontal rail painted (2 coats) with yellow and white stripes, 150 mm in width at an angle of 450, 'A' frame painted with 2 coats of yellow paint, complete as per IRC:SP:55-2001)	each	4294.00
8.44	Permanent Type Barricade in Construction Zone		

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
A	With Steel Components (Construction of a permanent type barricade made of steel components, 1.5 m high from road level, fitted with 3 horizontal rails 200 mm wide and 4 m long on 50 x 50 x 5 mm angle iron vertical support, painted with yellow and white strips, 150 mm in width at an angle of 45°, complete as per IRC:SP:55-2001)	each	6789.00
B	With Wooden Components (Construction of a permanent type barricade made of wooden components, 1.5 m high from road level, fitted with 3 horizontal planks 200 mm wide and 3.66 m long on 100 x 100 mm wooden vertical post, painted with yellow and white strips, 150 mm in width at an angle of 45°, complete as per IRC:SP:55-2001)	each	6852.00
C	With Bricks (Construction of a permanent type barricade made with brick work in mud mortar, 1.5 m high, 4 m long, 600 mm thick, plastered with cement mortar 1:6, painted with yellow and white strips)	each	51665.00
8.45	Drum Delineator in Construction Zone (Provision of metal drum/empty bitumen drum delineator, 300 mm in diameter, 800 mm high, filled with earth for stability, painted in circumferential strips of alternate black and white 100 mm wide fitted with reflectors 3 Nos of 7.5 cm dia, all as per IRC:SP:55-2001)	each	936.00
8.46	Flagman (Positioning of a smart flagman with a yellow vest and a yellow cap and a red flag 600 x 600 mm securely fastened to a staff 1 m in length for guiding the traffic)	each	811.00
	CHAPTER-9		
	PIPE CULVERTS		
9.1	PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 mix with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	cum	10884.00
9.2	Laying Reinforced Cement Concrete Pipe NP4/prestressed concrete pipe on first class bedding in single row . (Laying Reinforced cement concrete pipe NP4/prestressed concrete pipe for culverts on first class bedding of granular material in single row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets .)		
A	1000 mm dia	metre	20271.00
B	1200 mm dia	metre	22027.00
9.3	Laying Reinforced Cement Concrete Pipe NP 4 /prestressed concrete pipe on first class bedding in double row . (Laying Reinforced cement concrete pipe NP4/prestressed concrete pipe for culverts on first class bedding of granular material in double row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets .)		
A	1000 mm dia	metre	44088.00
B	1200 mm dia	metre	44636.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
	CHAPTER-10		
	MAINTENANCE OF ROADS		
10.1	Restoration of Rain Cuts (Restoration of rain cuts with soil, moorum, gravel or a mixture of these, clearing the loose soil, benching for 300 mm width, laying fresh material in layers not exceeding 250 mm and compacting with plate compactor or power rammers to restore the original alignment, levels and slopes)	cum	327.00
10.2	Maintenance of Earthen Shoulder (filling with fresh soil) (Making up loss of material/ irregularities on shoulder to the design level by adding fresh approved soil and compacting it with appropriate equipment.)	sqm	95.00
10.3	Maintenance of Earth Shoulder (stripping excess soil) (Stripping excess soil from the shoulder surface to achieve the approved level and compacting with plate compactor)	sqm	27.20
10.4	Filling Pot- holes and Patch Repairs with open - graded Premix surfacing, 20mm. (Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 511, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2)	sqm	206.00
10.5	Filling Pot- holes and Patch Repairs with - Bituminous concrete, 40mm. (Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 504, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2)		
(i)	for grading I Material	sqm	498.00
(ii)	for grading II Material	sqm	527.00
10.6	Crack Filling (Filling of crack using slow - curing bitumen emulsion and applying crusher dust in case crack are wider than 3mm.)	metre	7.00
10.7	Dusting (Applying crusher dust to areas of road where bleeding of excess bitumen has occurred.)	sqm	3.54
10.8 A	Fog Seal (ref item 5.17)	sqm	74.00
B	Crack Prevention courses. (ref item 5.21)		
(i)	Stress Absorbing Membrane (SAM) crack width less than 6 mm	sqm	91.00
(ii)	Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm	sqm	118.00
(iii)	Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 %	sqm	205.60
(iv)	Bitumen Impregnated Geotextile	sqm	164.00
C	Slurry Seal (ref item 5.15)		
(i)	5 mm thickness	sqm	164.00
(ii)	3 mm thickness	sqm	109.00
(iii)	1.5 mm thickness	sqm	51.00
D	Surface Dressing for maintenance works. (ref item 5.9)		
(i)	19 mm nominal chipping size	sqm	116.00
(ii)	13 mm nominal size chipping	sqm	88.00
10.9	Repair of joint Grooves with Epoxy Mortar Repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints in concrete pavements using epoxy mortar or epoxy concrete)	metre	1214.00
10.10	Repair of old Joints Sealant (Removal of existing sealant and re sealing of contraction, longitudinal or expansion joints in concrete pavement with fresh sealant material)	metre	146.00
10.11	Hill Side Drain Clearance (Removal of earth from the choked hill side drain and disposing it on the valley side manually)	metre	74.00
10.12	Land Slide Clearance in soil (Clearance of land slides in soil and ordinary rock by a bull-dozer D 80 A-12, 180 HP and disposal of the same on the valley side)	cum	72.00
10.13	Land slide Clearance in Hard Rock Requiring Blasting (Clearing of land slide in hard rock requiring blasting for 50% of the boulders and disposal of the same on the valley side.)	cum	204.00
10.14	Snow Clearance on Roads with Dozer (Snow clearance from road surface by a bull- dozer 165 Hp and disposing it on the valley side)	cum	4.90
10.15	Snow Clearance on Roads with Snow Blowers (Snow clearance from road surface by a snow blower and disposing on the valley side.)	cum	2.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
	CHAPTER-11		
	HORTICULTURE		
11.1	Spreading of Sludge Farm Yard Manure or/and good Earth (Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm- yard manure or/and good earth to be paid for separately))	cum	47.00
11.2	Grassing with 'Doobs' Grass (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)		
(i)	In rows 15 cm apart in either direction	sqm	118.00
(ii)	In rows 7.5 cm apart in either direction	sqm	224.00
11.3	Making Lawns including Ploughing and Dragging with 'Swagha' Breaking of Clod (Making lawns including ploughing and breaking of clod, removal of rubbish, dressing and supplying doobs grass roots and planting at 15 cm apart, including supplying and spreading of farm yard manure at rate of 0.18 cum per 100 sqm)	sqm	145.00
11.4	Maintenance of Lawns or Turfing of Slopes (Maintenance of lawns or Turfing of slopes (rough grassing) for a period of one year including watering etc)	sqm	826.00
11.5	Turfing Lawns with Fine Grassing including Ploughing, Dressing (Turfing lawns with fine grassing including ploughing, dressing including breaking of clods, removal of rubbish, dressing and supplying doobs grass roots at 10 cm apart, including supplying and spreading of farm yard manure at rate of 0.6 cum per 100 sqm)	sqm	153.00
11.6	Maintenance of Lawns with Fine Grassing for the First Year	sqm	675.00
11.7	a) Planting Permanent Hedges including Digging of Trenches (Planting permanent hedges including digging of trenches, 60 cm wide and 45 cm deep, refilling the excavated earth mixed with farmyard manure, supplied at the rate of 4.65 cum per 100 metres and supplying and planting hedge plants at 30 cm apart)	metre	270.00
(b)	Maintenance of Hedge for one year	metre	501.00
11.8	a) Planting Flowering Plants and Shrubs in Central Verge	km	99227.00
(b)	Maintenance of Flowering Plants and Shrubs in Central Verge for one Year	km	496950.00
11.9	Planting of Trees and their Maintenance for one Year (Planting of trees by the road side (Avenue trees) in 0.60 m dia holes, 1 m deep dug in the ground, mixing the soil with decayed farm yard/sludge manure, planting the saplings, backfilling the trench, watering, fixing the tree guard and maintaining the plants for one year)	each	2361.00
11.10	Renovation Lawns including, Weeding, Forking the Ground, Top Dressing with Forked Soil (Renovation lawns including, weeding, forking the ground, top dressing with forked soil, watering and maintenance the lawns, for 30 days or more, till the grass forms a thick lawn, free from weeds, and fit for moving and disposal of rubbish as directed, including supplying good earth, if needed but excluding the cost of well decayed farm yard manure)	sqm	47.00
11.11	Supply at Site Well Decayed Farm Yard Manure (Supply at site of work well decayed farm yard manure, from any available source, approved by the engineer in charge including screening and stacking)	cum	
11.12	Supply at Site of Work/ Store - Deoiled Neem Cake (Supply at site of work/ store- deoiled neem cake duly packed in used gunny bags)	quintal	
11.13	Supplying Sludge (Supplying sludge duly stacked at site/ store)	cum	
11.14	Half Brick Circular Tree Guard, in 2nd class Brick, internal diametre 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground (Half brick circular tree guard, in 2nd class brick, internal diametre 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground, bottom two courses laid dry, and top three courses in cement mortar 1:6 (1 cement 6 sand) and the intermediate courses being in dry honey comb masonry, as per design complete)	each	6529.00
11.15	Edging with 2nd class Bricks, laid dry lengthwise (Edging with 2nd class bricks, laid dry lengthwise, including excavation, refilling, consolidation, with a hand packing and spreading nearly surplus earth within a lead of 50 metres)	metre	133.00
11.16	Making Tree Guard 53 cm dia and 1.3 m high as per design from empty bitumen drum (Making tree guard 53 cm dia and 1.3 m high as per design from empty bitumen drum, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets, complete in all respect)	each	9993.00
11.17	Making Tree Guard 53 cm dia and 2 metres high as per design from empty bitumen drums (Making tree guard 53 cm dia and 2 metres high as per design from empty bitumen drums, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing and fixing four legs 40 cm long of 30 x 3 mm MS riveted to tree guard and providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets complete in all respects)	each	22499.00
11.18	Wrought Iron and Mild Steel Welded Work (Wrought iron and mild steel welded work) (using angles, square bars, tees and channel grills, grating frames, gates and tree guards of any size and design etc. including cost of screens and welding rods or bolts and nuts complete fixed in position but without the cost of excavation and concrete for fixing which will be paid separately)	quintal	12045.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
11.19	Tree Guard with MS Iron (Providing and fixing MS iron tree guard 60 cm dia and 2 metre high above ground level formed of 4 Nos (25 x 6 mm) and 8 Nos (25 x 3 mm) vertical MS riveted to 3 Nos (25 x 6 mm) iron rings in two halves, bolted together with 8 mm dia and 30 mm long bolts including painting two coats with paint of approved brand over a coat of priming, complete in all respects.)	each tree guard	3061.00
11.20	Tree Guard with MS Angle Iron and Steel Wire (Providing and fixing tree guard 0.60 metre square, 2.00 metre high fabricated with MS angle iron 30 x 30 x 3 mm, MS iron 25 x 3 mm and steel wire 3 mm dia welded and fabricated as per design in two halves bolted together)	each tree guard	4312.00
11.21	Compensatory Afforestation (Planting trees as compensatory afforestation at the rate of 290 trees per hectare at a spacing of 6 m by grubbing and leveling the ground upto a depth of 150 mm, digging holes 0.9 m dia, 1 m deep, mixing farm yard/sludge manure with soil, planting of sapling 2 m high with 25 cm dia stem, backfilling the hole and watering)	hectare	136411.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
	CHAPTER-12		
	FOUNDATIONS		
12.1	Excavation for Structures (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.)		
I	Ordinary soil		
A	Manual Means		
(i)	upto 3 m depth	cum	281.00
(ii)	3 m to 6 m depth	cum	361.00
(iii)	Above 6 m depth	cum	481.00
B	Mechanical Means		
(i)	Depth upto 3 m	cum	79.00
(ii)	Depth 3 m to 6 m	cum	90.00
(iii)	Depth above 6m	cum	114.00
II	Ordinary rock (not requiring blasting)		
A	Manual Means		
(i)	Depth upto 3 m	cum	401.00
B	Mechanical Means	cum	97.00
III	Hard rock (requiring blasting)		
A	Manual Means	cum	1054.00
IV	Hard rock (blasting prohibited)		
A	Mechanical Means	cum	1173.00
V	Marshy soil		
(i)	upto 3 m depth		
A	Manual means	cum	940.00
B	Mechanical Means	cum	262.00
VI	Back Filling in Marshy Foundation Pits	cum	574.00
12.2	Filling Annular Space Around Footing in Rock (Lean cement concrete 1:3:6 nominal mix. Rate may be taken as per items 13.4.)		
12.3	Sand Filling in Foundation Trenches as per Drawing & Technical Specification	cum	11765.00
12.4	PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	cum	12236.00
12.5	Brick masonry work in cement mortar 1:3 in foundation complete excluding pointing and plastering, as per drawing and technical specifications	cum	20421.00
12.6 A	Cement mortar 1:3 (1 cement :3 sand)	cum	11483.00
B	Cement mortar 1:2 (1 cement :2 sand)	cum	11807.00
C	Cement mortar 1:4 (1 cement :4 sand)	cum	11205.00
D	Cement mortar 1:6 (1 cement :6 sand)	cum	11895.00
12.7	Stone masonry work in cement mortar 1:3 in foundation complete as drawing and Technical Specification		
(a)	Square Rubble Coursed rubble masonry(first sort)	cum	11746.00
(b)	Random Rubble Masonry	cum	10441.00
12.8	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications		
A	PCC Grade M15	cum	12200.00
B	PCC Grade M20	cum	13456.00
C	RCC Grade M20		
Case I	Using concrete mixer	cum	13679.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	10038.00
D	PCC Grade M25		
Case I	Using concrete Mixer	cum	14020.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	10374.00
E	RCC Grade M25		
Case I	Using concrete Mixer	cum	14250.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	10618.00
F	PCC Grade M30		
Case I	Using Concrete Mixer	cum	14051.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	10407.00
G	RCC Grade M30		
Case I	Using Concrete Mixer	cum	14252.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	10630.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
H	RCC Grade M35		
Case I	Using Concrete Mixer	cum	14347.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	10743.00
12.9	Providing and constructing temporary island 16 m diameter for construction of well foundation for 8m dia. Well.		
A	Assuming depth of water 1.0 m and height of island to be 1.25m.	each	362638.00
B	Assuming depth of water 4.0 m and height of island 4.5 m.	each	2809311.00
C	Providing and constructing one span service road to reach island location from one pier location to another pier location	metre	7125.00
12.10	Providing and laying cutting edge of mild steel weighing 40 kg per metre for well foundation complete as per drawing and technical specification.	tonne	133777.00
12.11	Plain/Reinforced cement concrete, in well foundation complete as per drawing and technical specification		
A	Well curb		
(i)	RCC M20 Grade		
Case I	Using concrete mixer	cum	15526.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	11583.00
(ii)	RCC M25 Grade		
Case I	Using concrete mixer	cum	16483.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	13339.00
(iii)	RCC M35 Grade		
Case I	Using concrete mixer	cum	16716.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	13622.00
B	Well steining		
(i)	PCC M15 Grade	cum	12904.00
(ii)	PCC M20 Grade	cum	14232.00
(iii)	RCC M20 Grade		
Case I	Using concrete mixer	cum	14470.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	10618.00
(iv)	PCC M25 Grade		
Case I	Using concrete mixer	cum	14865.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	10999.00
(v)	RCC M25 Grade		
Case I	Using concrete mixer	cum	15109.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	12227.00
(vi)	PCC M30 Grade		
Case I	Using concrete mixer	cum	14934.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	11061.00
(vii)	RCC M30 Grade		
Case I	Using concrete mixer	cum	15148.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	11299.00
(viii)	RCC M35 Grade		
Case I	Using concrete mixer	cum	15323.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	12487.00
(ix)	RCC M40 Grade		12596.00
C	Bottom Plug		
(i)	PCC Grade M20		
Case I	Using Concrete Mixer	cum	14997.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	11007.00
(ii)	PCC Grade M25		
Case I	Using Concrete Mixer	cum	15432.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	11438.00
(iii)	PCC Grade M30		
Case I	Using Concrete Mixer	cum	15498.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	11507.00
(iv)	PCC Grade M35		
Case I	Using Concrete Mixer	cum	15651.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	11656.00
D	Intermediate plug		
(i)	Grade M20 PCC		
Case I	Using Concrete Mixer	cum	14346.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	10568.00
(ii)	Grade M25 PCC		
Case I	Using Concrete Mixer	cum	14760.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	10978.00
(iii)	Grade M30 PCC		
Case I	Using Concrete Mixer	cum	14822.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	11045.00
E	Top plug		
(i)	Grade M15 PCC		
Case I	Using Concrete Mixer	cum	11731.00
(ii)	Grade M20 PCC		
Case I	Using Concrete Mixer	cum	12938.00
(iii)	Grade M25 PCC		
Case I	Using Concrete Mixer	cum	13514.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	9999.00
(iv)	Grade M30 PCC		
Case I	Using Concrete Mixer	cum	13576.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	10056.00
F	Well cap		
(i)	RCC Grade M20		
Case I	Using concrete Mixer	cum	13614.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	9972.00
(ii)	RCC Grade M25		
Case I	Using concrete Mixer	cum	14250.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	10620.00
(iii)	RCC Grade M30		
Case I	Using Concrete Mixer	cum	14252.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	10629.00
(iv)	RCC Grade M35		
Case I	Using Concrete Mixer	cum	14347.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	10743.00
(v)	RCC M40 Grade	cum	11848.00
12.12	Sinking of 6 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	Depth below bed level upto 3.0 M	metre	4791.00
(ii)	Beyond 3m upto 10m depth	metre	6489.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	8570.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	16075.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .		19290.00
(v)	Beyond 30m upto 40 m	metre	
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter		38193.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	45832.00
B	Clayey soil (6m dia. Well)		
(i)	Depth below bed level upto 3.0 M	metre	6527.00
(ii)	Beyond 3m upto 10m depth	metre	13973.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	18454.00
b	Add for dewatering @ 5% of cost, if required.	metre	19377.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	34616.00
b	Add 5% of cost for dewatering of the cost, if required	metre	45434.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour).	metre	43270.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	82242.00
b	Add 5% of cost for dewatering, if required	metre	103625.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	98691.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
C	Soft rock (6m dia well)		
(i)	Depth of soft rock strata upto 3m	metre	28195.00
D	Hard rock (6m dia well)		
(i)	Depth of soft rock strata upto 3m	metre	27097.00
12.13	Sinking of 7 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	Depth below bed level upto 3.0 M	metre	13107.00
(ii)	Beyond 3m upto 10m depth	metre	8688.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	11473.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	21520.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	25824.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	51130.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	61357.00
B	Clayey soil (7m dia. Well)		
(i)	Depth below bed level upto 3.0 M	metre	8688.00
(ii)	Beyond 3m upto 10m depth	metre	12201.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	16115.00
b	Add for dewatering @ 5% of cost, if required.	metre	16921.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	30230.00
b	Add 5% of cost for dewatering on the cost, if required	metre	39677.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour).	metre	37788.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	71823.00
b	Add 5% of cost for dewatering, if required	metre	90496.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).		86187.00
C	Soft rock (7m dia well)		
(i)	Depth of soft rock strata upto 3m	metre	20993.00
D	Hard rock (7m dia well)		
(i)	Depth upto 3 m	metre	34531.00
12.14	Sinking of 8 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	Depth below bed level upto 3.0 M	metre	8187.00
(ii)	Beyond 3m upto 10m depth	metre	9919.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	13101.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	24573.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	29487.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	8637.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	10364.00
B	Clayey soil (8m dia. Well)		
(i)	Depth upto 3.0 M	metre	10644.00
(ii)	Beyond 3m upto 10m depth	metre	14180.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	18728.00
b	Add for dewatering @ 5% of cost, if required.	metre	19664.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	35129.00
b	Add 5% of cost for dewatering on the cost, if required	metre	46106.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour).	metre	43911.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	83462.00
b	Add 5% of cost for dewatering, if required	metre	105162.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	100154.00
C	Soft rock (8m dia well)		
(i)	Depth in soft rock strata upto 3m	metre	23712.00
D	Hard rock (8m dia well)		
(i)	Depth in hard rock strata upto 3 m	metre	37149.00
12.15	Sinking of 9 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	Depth below bed level upto 3.0 M	metre	8407.00
(ii)	Beyond 3m upto 10m depth	metre	10859.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	14342.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	26902.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	32283.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	63917.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	76701.00
B	Clayey soil (9m dia. Well)		
(i)	Depth below bed level upto 3.0 M	metre	11372.00
(ii)	Beyond 3m upto 10m depth	metre	15235.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	20121.00
b	Add for dewatering @ 5% of cost, if required.	metre	21128.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	37743.00
b	Add 5% of cost for dewatering on the cost, if required	metre	49538.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour).	metre	47179.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	89674.00
b	Add 5% of cost for dewatering, if required	metre	112989.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	107609.00
C	Soft rock (9m dia well)		
(i)	Depth upto 3m	metre	28805.00
D	Hard rock (9m dia well)		
(i)	Depth of hard rock strata upto 3 m	metre	42703.00
12.16	Sinking of 10 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	Depth below bed level upto 3.0 M	metre	9627.00
(ii)	Beyond 3m upto 10m depth	metre	11603.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	15325.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	28746.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	34495.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	68297.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	81956.00
B	Clayey soil (10m dia. Well)		
(i)	Depth below bed level upto 3.0 M	metre	13358.00
(ii)	Beyond 3m upto 10m depth	metre	15821.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	20896.00
b	Add for dewatering @ 5% of cost, if required.	metre	21941.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	39196.00
b	Add 5% of cost for dewatering on the cost, if required	metre	51444.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour).	metre	48995.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	93122.00
b	Add 5% of cost for dewatering, if required	metre	117334.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).		111746.00
C	Soft rock (10m dia well)		
(i)	Depth of soft rock strata upto 3m	metre	29253.00
D	Hard rock (10m dia well)		
(i)	Depth of hard rock strata upto 3 m	metre	45165.00
12.17	Sinking of 11 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	Depth from bed level upto 3.0 M	metre	20935.00
(ii)	Beyond 3m upto 10m depth	metre	20143.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	26602.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	49898.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	59878.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	118554.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	142264.00
B	Clayey soil (11 m dia. Well)		
(i)	Depth from bed level upto 3.0 M	metre	22197.00
(ii)	Beyond 3m upto 10m depth	metre	33344.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	44037.00
b	Add for dewatering @ 5% of cost, if required.	metre	46239.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	82602.00
b	Add 5% of cost for dewatering on the cost, if required	metre	108416.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour).	metre	103253.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	196251.00
b	Add 5% of cost for dewatering, if required	metre	247277.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	235501.00
C	Soft rock (11m dia well)		
(i)	Depth of soft rock strata upto 3m	metre	65110.00
D	Hard rock (11m dia well)		
(i)	Depth of hard rock upto 3 m	metre	98597.00
12.18	Sinking of 12 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	I) Depth below bed level upto 3.0 M	metre	45268.00
(ii)	Beyond 3m upto 10m depth	metre	53305.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	70399.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	132051.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	158461.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	313732.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	376479.00
B	Clayey soil (12 m dia. Well)		
(i)	Depth below bed level upto 3.0 M	metre	53220.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
(ii)	Beyond 3m upto 10m depth	metre	78488.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	103658.00
b	Add for dewatering @ 5% of cost, if required.	metre	108841.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	194435.00
b	Add 5% of cost for dewatering on the cost, if required	metre	255196.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour).	metre	243043.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	461948.00
b	Add 5% of cost for dewatering, if required	metre	582055.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	554338.00
C	Soft rock (12m dia well)		
(i)	Depth of soft rock strata upto 3m	metre	148390.00
D	Hard rock (12m dia well)		
(i)	Depth of hard rock strata upto 3 m	metre	211298.00
12.19	Sinking of Twin D Type well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	Depth from bed level upto 3.0 M	metre	10089.00
(ii)	Beyond 3m upto 10m depth	metre	11015.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	14547.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	27288.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	32745.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	64832.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	77798.00
B	Clayey soil (Twin D Type Well)		
(i)	Depth below bed level upto 3.0 M	metre	12350.00
(ii)	Beyond 3m upto 10m depth	metre	17436.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	23027.00
b	Add for dewatering @ 5% of cost, if required.	metre	24179.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	43193.00
b	Add 5% of cost for dewatering on the cost, if required	metre	56691.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour).	metre	53991.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	102621.00
b	Add 5% of cost for dewatering, if required	metre	129302.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	123145.00
C	Soft rock (Twin D Type well)		
(i)	Depth of soft rock strata upto 3m	metre	31265.00
D	Hard rock (Twin D Type well)		
(i)	Depth of hard rock strata upto 3 m	metre	46121.00
12.20	Pneumatic sinking of wells with equipment of approved design, drawing and specifications worked by competent and trained personnel and comprising of compression and decompression chambers, reducers, two air locks separately for men and plant & materials, arrangement for supply of fresh air to working chambers, check valves, exhaust valves, shafts made from steel plates of riveted construction not less than 6 mm thick to withstand an air pressure of 0.50 MPa, controlled blasting of hard rock where required, staircases and 1 m wide landing plate forms with railing, arrangement for compression and decompression, electric lighting of 50 V maximum, proper rooms for rest and medical examinations and compliance with safety precautions as per IS:4138, all as per clause 1207.6 of MoRTH Specifications.		
12.21	Sand filling in wells complete as per drawing and technical specifications	cum	13730.00
12.22	Providing steel liner 10 mm thick for curbs and 6mm thick for steining of wells including fabricating and setting out as per detailed drawing	tonne	120069.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
12.23	Bored cast-in-situ M35 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. (Pile diameter-750 mm)	metre	14671.00
12.24	Bored cast-in-situ M35 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. (Pile diameter-1000 mm)	metre	25034.00
12.25	Bored cast-in-situ M35 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. (Pile diameter-1200 mm)	metre	33373.00
12.26	Driven cast-in-place vertical M35 grade R.C.C. pile excluding reinforcement complete as per drawing and & Technical Specification (Pile diameter - 750 mm)	metre	6316.00
12.27	Driven cast-in-place vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile diameter - 1000 mm)	metre	10755.00
12.28	Driven cast-in-place vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile diameter - 1200 mm)	metre	15577.00
12.29	Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile Diameter=500 mm)	metre	3239.00
12.30	Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile Diameter=750 mm)	metre	5992.00
12.31	Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile Diameter=1000 mm)	metre	10326.00
12.32	Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Size of pile - 300 mm x 300 mm)	metre	2053.00
12.33	Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Size of pile - 500 mm x 500 mm)	metre	3813.00
12.34	Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Size of pile - 750 mm x 750 mm)	metre	7501.00
12.35	Driven vertical steel piles complete as per drawing and & Technical Specification (Section of the pile - H Section steel column 400 x 250 mm (ISHB Series))	metre	7869.00
12.36	Driven vertical steel piles complete as per drawing and & Technical Specification (Section of the pile - H Section steel column 450 x 250 mm (ISHB Series))	metre	8878.00
12.37	Pile load test on single vertical pile in accordance with IS:2911(Part-IV)		
12.38	Cement concrete for reinforced concrete in pile cap complete as per drawing and Technical Specification		
A	RCC Grade M20		
(i)	Using Concrete Mixer	cum	13654.00
(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	10043.00
B	RCC Grade M25		
(i)	Using concrete mixer.	cum	14281.00
(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	10629.00
C	RCC Grade M30		
(i)	Using concrete mixer.	cum	14360.00
(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	10750.00
D	RCC Grade M35		
(i)	Using concrete mixer.	cum	14526.00
(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	10874.00
12.39	Levelling course for Pile cap	cum	12119.00
12.40	Supplying, fitting and placing un-coated HYSD bar reinforcement in foundation complete as per drawing and technical specifications	tonne	88112.00
12.41	Supplying, fitting and placing un-coated Mild steel reinforcement complete in foundation as per drawing and technical specification	tonne	88752.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
	CHAPTER-13		
	SUB-STRUCTURE		
13.1	Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and technical specifications	cum	20765.00
13.2	Pointing with cement mortar (1:3) on brick work in substructure as per Technical specifications	sqm	139.30
13.3	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical specifications	sqm	327.60
13.4	Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specifications		
A	Random Rubble Masonry	cum	10621.00
B	Coursed rubble masonry (first sort)	cum	10828.00
C	Ashlar masonry (first sort)	cum	14497.00
13.5	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications		
A	PCC Grade M15		
(p)	Height upto 5m	cum	12904.00
B	PCC Grade M20		
(p)	Height upto 5m	cum	14232.00
C	PCC Grade M25		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	14865.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	10999.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	15406.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	11399.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	16082.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	11899.00
D	PCC Grade M30		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	14934.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	11061.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	15477.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	11464.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	16156.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	11966.00
E	RCC Grade M20		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	14470.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	10618.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	14996.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	11004.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	15654.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	11487.00
F	RCC Grade M25		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	15109.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	12227.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	15604.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	12627.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	16346.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	13228.00
G	RCC Grade M30		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	15148.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	11299.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	15575.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	11617.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	16181.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	12069.00
H	RCC Grade M35		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	15323.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	12487.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	15657.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	12760.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	16159.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	13168.00
13.6	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	tonne	88445.00
13.7	Supplying, fitting and placing Mild steel reinforcement complete in sub-structure as per drawing and technical specification	tonne	87166.00
13.8	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	each	768.00
13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification		
A	Granular material	cum	3274.00
B	Sandy material	cum	12163.00
13.10	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and technical specification.	cum	4011.00
13.11	Supplying, fitting and fixing in position true to line and level cast steel rocker bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	tonne capacity	709.00
13.12	Supplying, fitting and fixing in position true to line and level forged steel roller bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	tonne capacity	663.00
13.13	Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel complete including all accessories as per drawing and Technical Specifications and BS: 5400, section 9.1 & 9.2 (for PTFE) and clause 2004 of MoRTH Specifications.	tonne capacity	3726.00
13.14	Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and clause 2005 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	cubic centimetre	8.90
13.15	Supplying, fitting and fixing in position true to line and level sliding plate bearing with stainless steel plate sliding on stainless steel plate with mild steel matrix complete including all accessories as per drawing and Technical Specifications.	tonne capacity	3722.00
13.16	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.	tonne capacity	665.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
	CHAPTER-14		
	SUPER-STRUCTURE		
14.1	<i>Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification</i>		
A	RCC Grade M20		
Case I	Using Concrete Mixer		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	15709.00
(q)	Height 5m to 10m	cum	16364.00
(r)	Height above 10m	cum	17018.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	16364.00
(q)	Height 5m to 10m	cum	17018.00
(r)	Height above 10m	cum	17673.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	11506.00
(q)	Height 5m to 10m	cum	11985.00
(r)	Height above 10m	cum	12465.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	11985.00
(q)	Height 5m to 10m	cum	12465.00
(r)	Height above 10m	cum	12944.00
B	RCC Grade M25		
Case I	Using Concrete Mixer		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	16433.00
(q)	Height 5m to 10m	cum	17117.00
(r)	Height above 10m	cum	17802.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	17117.00
(q)	Height 5m to 10m	cum	17802.00
(r)	Height above 10m	cum	18487.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	12240.00
(q)	Height 5m to 10m	cum	12750.00
(r)	Height above 10m	cum	13260.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	12750.00
(q)	Height 5m to 10m	cum	13260.00
(r)	Height above 10m	cum	13770.00
C	RCC Grade M 30		
Case I	Using Concrete Mixer		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	16588.00
(q)	Height 5m to 10m	cum	17279.00
(r)	Height above 10m	cum	17970.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	17279.00
(q)	Height 5m to 10m	cum	17970.00
(r)	Height above 10m	cum	18662.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump.		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	12343.00
(q)	Height 5m to 10m	cum	12857.00
(r)	Height above 10m	cum	13372.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	12857.00
(q)	Height 5m to 10m	cum	13372.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
(r)	Height above 10m	cum	13886.00
D	RCC/PSC Grade M35		
Case 1	Using concrete mixer.		
(i)	For solid slab super-structure, 18-28% of (a+b+c)		
(p)	Height upto 5m	cum	16500.00
(q)	Height 5m to 10m	cum	17199.00
(r)	Height above 10m	cum	17898.00
(ii)	For T-beam & slab, 23-33% of (a+b+c)		
(p)	Height upto 5m	cum	17199.00
(q)	Height 5m to 10m	cum	17898.00
(r)	Height above 10m	cum	18597.00
(iii)	For box girder and balanced cantilever, 38-58% of cost of concrete.		
(p)	Height upto 5m	cum	19296.00
(q)	Height 5m to 10m	cum	20695.00
(r)	Height above 10m	cum	22093.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump		
(i)	For solid slab super-structure, 18-28% of (a+b+c)		
(p)	Height upto 5m	cum	12315.00
(q)	Height 5m to 10m	cum	12837.00
(r)	Height above 10m	cum	13359.00
(ii)	For T-beam & slab, 23-33% of (a+b+c)		
(p)	Height upto 5m	cum	12837.00
(q)	Height 5m to 10m	cum	13359.00
(r)	Height above 10m	cum	13881.00
(iii)	For box girder and balanced cantilever, 38-58% of cost of concrete.		
(p)	Height upto 5m	cum	14403.00
(q)	Height 5m to 10m	cum	15446.00
(r)	Height above 10m	cum	16490.00
E	PSC Grade M-40		
Case 1	Using concrete mixer.		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	18109.00
(q)	Height 5m to 10m	cum	18863.00
(r)	Height above 10m	cum	19618.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	18863.00
(q)	Height 5m to 10m	cum	19618.00
(r)	Height above 10m	cum	20372.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump		
(i)	For solid slab super-structure, 18-28% of (a+b+c)		
(p)	Height upto 5m	cum	13535.00
(q)	Height 5m to 10m	cum	14108.00
(r)	Height above 10m	cum	14682.00
(ii)	For T-beam & slab, 23-33% of (a+b+c)		
(p)	Height upto 5m	cum	14108.00
(q)	Height 5m to 10m	cum	14682.00
(r)	Height above 10m	cum	15255.00
(iii)	For box girder and balanced cantilever, 38-58% of cost of concrete.		
(p)	Height upto 5m	cum	15829.00
(q)	Height 5m to 10m	cum	16976.00
(r)	Height above 10m	cum	18123.00
F	PSC Grade M-45		
(i)	For solid slab/voided slab super-structure, 16-26% of cost of concrete (a+b+c)		
(p)	Height upto 5m	cum	13816.00
(q)	Height 5m to 10m	cum	14411.00
(r)	Height above 10m	cum	15007.00
(ii)	For I-beam & slab including launching of precast girders by launching truss upto 40 m span, 21-31% of cost of concrete.		
(p)	Height upto 5m	cum	14411.00
(q)	Height 5m to 10m	cum	15007.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
(r)	Height above 10m	cum	15602.00
(iii)	For cast-in-situ box girder, segmental construction and balanced cantilever, 36-56% of cost of concrete.		
(p)	Height upto 5m	cum	16198.00
(q)	Height 5m to 10m	cum	17389.00
(r)	Height above 10m	cum	18580.00
G	PSC Grade M-50		
(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55% of cost of concrete		
(p)	Height upto 5m	cum	16503.00
(q)	Height 5m to 10m	cum	17726.00
(r)	Height above 10m	cum	18948.00
H	PSC Grade M- 55		
(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55% of cost of concrete		
(p)	Height upto 5m	cum	17169.00
(q)	Height 5m to 10m	cum	18440.00
(r)	Height above 10m	cum	19712.00
14.2	a) Supplying, fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications	tonne	90857.00
14.3	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	tonne	177625.00
14.4	Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications	cum	17215.00
14.5	Mastic Asphalt (Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat 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 fine grained hard stone chipping of 9.5 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 not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.)	sqm	556.00
14.6	Construction of precast RCC railing of M30 Grade, aggregate size not exceeding 12 mm, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specifications.	metre	2686.00
14.7	Construction of RCC railing of M30 Grade in-situ with 20 mm nominal size aggregate, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specifications.	metre	2619.00
14.8	Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification	metre	4758.00
14.9	Drainage Spouts complete as per drawing and Technical specification	each	4995.00
14.10	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	cum	11731.00
14.11	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification	cum	15020.00
14.12	Providing anti-corrosive treatment to HYSD reinforcement with Fusion Bonded Epoxy Coating (FBEC) (To be taken as per the prevailing market rates.)	tonne	
14.13	Precast - pretensioned Girders (Providing, precasting, transportation and placing in position precast pretensioned concrete girders as per drawing and technical specifications)	cum	53266.00
14.14	Providing and fixing Helical pipes in voided concrete slabs	metre	3818.00
14.15	Crash Barriers (The rate analysis for rigid crash barrier in reinforced cement concrete, semi-rigid crash barrier with metal beam and flexible crash barrier with wire ropes have been made and included in chapter-8 on Traffic and Transportation.)		
14.16	Painting on concrete surface (Providing and applying 2 coats of water based cement paint to unplastered concrete surface after cleaning the surface of dirt, dust, oil, grease, efflorescence and applying paint @ of 1 litre for 2 Sq.m.)	metre	305.00
14.17	Buried Joint (Providing and laying a buried expansion joint, expansion gap being 20 mm, covered with 12 mm thick, 200 mm wide galvanised weldable structural steel plate as per IS: 2062, placed symmetrical to centre line of the joint, resting freely over the top surface of the deck concrete, welding of 8 mm dia. 100 mm long galvanised nails spaced 300 mm c/c along the centre line of the plate, all as specified in clause 2604.)	metre	2013.00
14.18	Filler joint		
(i)	Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.	metre	7228.00
(ii)	Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.	metre	747.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
(iii)	Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications.	metre	241.00
(iv)	Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight	metre	57.00
14.19	Asphaltic Plug joint (Providing and laying of asphaltic plug joint to provide for horizontal movement of 25 mm and vertical movement of 2 mm, depth of joint varying from 75 mm to 100 mm, width varying from 500 mm to 750 mm (in traffic direction), covered with a closure plate of 200mm x 6mm of weldable structural steel conforming to IS: 2062, asphaltic plug to consist of polymer modified bitumen binder, carefully selected single size aggregate of 12.5 mm nominal size and a heat resistant foam caulking/backer rod, all as per approved drawings and specifications.)	metre	1896.00
14.20	Elastomeric Slab Steel Expansion Joint (Providing and laying of an elastomeric slab steel expansion joint, catering to right or skew (less than 20 deg., moderately curved with maximum horizontal movement upto 50 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 and clause 2606 of MoRTH specifications for road & bridge works.)	metre	23425.00
14.21	Compression Seal Joint (Providing and laying of compression seal joint consisting of steel armoured nosing at two edges of the joint gap suitably anchored to the deck concrete and a preformed chloroprene elastomer or closed cell foam joint sealer compressed and fixed into the joint gap with special adhesive binder to cater for a horizontal movement upto 40 mm and vertical movement of 3 mm.)	metre	5497.00
14.22	Strip Seal Expansion Joint (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.)	metre	136.00
14.23	Modular Strip / Box Seal Joint (Providing and laying of a modular strip Box steel expansion joint including anchorage catering to a horizontal movement beyond 70 mm and upto 140mm, 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.)	metre	1217.00
14.24	Modular Strip / Box Seal Joint (Providing and laying of a modular strip box seal expansion joint catering to a horizontal movement beyond 140mm and upto 210mm, 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.)	metre	1576.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
	CHAPTER-15		
	RIVER TRAINING AND PROTECTION WORKS		
15.1	Providing and laying boulders apron on river bed for protection against scour with stone boulders weighing not less than 40 kg each complete as per drawing and Technical specification.		
A	Boulder laid dry without wire crates.	cum	3668.00
15.2	Boulder apron laid in wire crates (Providing and laying of boulder apron laid in wire crates made with 4mm dia GI wire conforming to IS: 280 & IS:4826 in 100mm x 100mm mesh (weaved diagonally) including 10% extra for laps and joints laid with stone boulders weighing not less than 40 kg each.)	cum	6109.00
15.3	Cement concrete blocks (size 0.5 x 0.5 x 0.5 m) (Providing and laying of apron with cement concrete blocks of size 0.5x0.5x0.5 m cast in-situ and made with nominal mix of M-15 grade cement concrete with a minimum cement content of 250 kg/cum as per IRC: 21-2000.)	cum	12444.00
15.4	Providing and laying Pitching on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical specifications		
A	Stone/Boulder	cum	3668.00
B	Cement Concrete blocks of size 0.3x0.3 x0.3 m cast in cement concrete of Grade M15	cum	12444.00
15.5	Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification	cum	4399.00
15.6	Geotextile Filter (Laying of a geotextile filter between pitching and embankment slopes on which pitching is laid to prevent escape of the embankment material through the voids of the stone pitching/cement concrete blocks as well as to allow free movement of water without creating any uplift head on the pitching.)	sqm	850.00
15.7	Toe protection (A toe wall for toe protection can either be in dry rubble masonry in case of dry rubble pitching or pitching with stones in wire crates or it can be in PCC M15 nominal mix if cement concrete block have been used for pitching . Rates for toe wall can be adopted from respective clauses depending upon approved design. The rate for excavation for foundation, dry rubble masonry and PCC M15 have been analysed and given in respective chapters.)		
15.8	Providing and laying Flooring complete as per drawing and Technical specifications laid over cement concrete bedding.		
A	Rubble stone laid in cement mortar 1:3	cum	13414.00
B	Cement Concrete blocks Grade M15	cum	16388.00
15.9	Dry rubble Flooring	cum	3682.00
15.10	Curtain wall complete as per drawing and Technical specification		
A	Stone masonry in cement mortar (1:3)	cum	11595.00
B	Cement concrete Grade M15	cum	12200.00
15.11	Flexible Apron :Construction of flexible apron 1 m thick comprising of loose stone boulders weighing not less than 40 kg beyond curtain wall.	cum	3039.00
15.12	Gabian Structure for Retaining Earth (Providing and construction of a gabain structure for retaining earth with segments of wire crates of size 7 m x 3 m x 0.6 m each divided into 1.5 m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be tied with 4 mm galvanised steel wire)	cum	6523.00
15.13	Gabian Structure for Erosion Control, River Training Works and Protection works (Providing and constructing gabain structures for erosion control, river training works and protection works with wire crates of size 2 m x 1 m x 0.3 m each divided into 1m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 mm x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be securely tied with 4 mm galvanised steel wire.)	cum	10637.00

Summary of Rate Analysis			
Item No.	Descriptions	Unit	Rate
	CHAPTER-16		
	REPAIR AND REHABILITATION		
16.1	Removal of existing cement concrete wearing coat including its disposal complete as per Technical specification without causing any detrimental effect to any part of the bridge structure and removal of dismantled material with all lifts and lead upto 1000m (Thickness 75 mm)	sqm	246.00
16.2	Removal of existing asphaltic wearing coat comprising of 50 mm thick asphaltic concrete laid over 12 mm thick mastic asphalt including disposal with all lift and lead upto 1000m.	sqm	185.00
16.3	Guniting concrete surface with cement mortar applied with compressor after cleaning surface and spraying with epoxy complete as per Technical specification	sqm	2435.00
16.4	Providing and inserting nipples with approved fixing compound after drilling holes for grouting as per Technical specifications including subsequent cutting/removal and sealing of the hole as necessary of nipples after completion of grouting with Cement/Epoxy	each	249.00
16.5	Sealing of cracks/porous concrete by injection process through nipples/Grouting complete as per Technical specification.		
A	Cement Grout	kg	159.00
B	Cement mortar (1:1) Grouting	kg	334.00
16.6	Patching of damaged concrete surface with polymer concrete and curing compounds, initiator and promoter, available in present formulations, to be applied as per instructions of manufacturer and as approved by the Engineer.	sqm	5073.00
16.7	Sealing of crack / porous concrete with Epoxy Grout by injection through nipples complete as per clause 2803.1.	kg	1529.00
16.8	Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per Technical specification	sqm	639.00
16.9	Removal of defective concrete, cleaning the surface thoroughly, applying the shotcrete mixture mechanically with compressed air under pressure, comprising of cement, sand, coarse aggregates, water and quick setting compound in the proportion as per clause 2807.1., sand and coarse aggregates conforming to IS: 383 and table 1 of IS: 9012 respectively, water cement ratio ranging from 0.35 to 0.50, density of gunite not less than 2000 kg/cum, strength not less than 25 Mpa and workmanship conforming to clause 2807.6.	sqm	790.00
16.10	Applying pre-packed cement based polymer mortar of strength 45 Mpa at 28 days for replacement of spalled concrete	sqm	394.00
16.11	Epoxy bonding of new concrete to old concrete	sqm	663.00
16.12	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical specification	tonne	689130.00
16.13	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical specification	tonne	658498.00
16.14	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical specification	tonne	609028.00
16.15	Replacement of bearings complete as per Technical specification	each	188398.00
16.16	Rectification of bearings as per Technical specifications	each	176781.00
16.17	Replacement of Expansion Joints complete as per drawings	metre	5209.00
16.18	Replacement of damaged concrete railing.	metre	471.00
16.19	Replacement of crash barrier.	metre	888.00
16.20	Replacement of damaged mild steel railing	metre	387.00
16.21	Repair of crash barrier (Repair of concrete crash barrier with cement concrete of M-30 grade by cutting and trimming the damaged portion to a regular shape, cleaning the area to be repaired thoroughly, applying cement concrete after erection of proper form work.)	metre	339.00
16.22	Repair of RCC Railing (Carrying out repair of RCC M30 railing to bring it to the original shape.)	metre	184.00
16.23	Repair of steel Railing (Repair of steel railing to bring it to the original shape)	metre	429.00

CHAPTER-1								
CARRIAGE OF MATERIALS								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
1.1			Loading and Unloading of Stone Boulder/Stone aggregates/Sand/Kanker/Moorum.	cum				
			Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip					
			Unit = cum					
			Taking output = 5.5 cum					
			Time required for					
			i) Positioning of tipper at loading point		1 Min			
			ii) Loading by front end loader 1 cum bucket capacity @ 25 cum per hour		13 Min			
			iii) Maneuvering, reversing, dumping and turning for return		2 Min			
			iv) Waiting time, unforeseen contingencies etc		4 Min			
			Total		20 Min			
			a) Machinery					
			Tipper 5.5 tonnes capacity	hour	0.330	1006.18	332.04	P&M-048
			Front end-loader 1 cum bucket capacity @ 25 cum/hour	hour	0.330	930.98	307.22	P&M-017
			b) Overhead charges @ 10% on (a)				63.93	
			c) Contractor's profit @ 16% on (a+b)				112.51	
			Cost for 5.5 cum = a+b+c				815.70	
			Rate per cum = (a+b+c)/ 5.5				148.31	
		Note	Unloading will be by tipping.			say	148.00	
1.2			Loading and Unloading of Boulders by Manual Means					
			Unit = cum					
			Taking output = 5.5 cum					
			a) Labour					
			Mate	day	0.110	582.53	64.08	L-12
			Mazdoor for loading and unloading	day	0.750	529.57	397.18	L-13
			b) Machinery					
			Tipper 5.5 tonne capacity	hour	0.750	1006.18	754.64	P&M-048
			c) Overhead charges @ 10% on (a+b)				121.59	
			d) Contractor's profit @ 16% on (a+b+c)				214.00	
			Cost for 5.5 cum = a+b+c+d				1551.48	
			Rate per cum = (a+b+c+d)/5.5				282.09	
		Note	Unloading will be by tipping.			say	282.00	
1.3			Loading and Unloading of Cement or Steel by Manual Means and Stacking.					
			Unit = tonne					
			Taking output = 10 tonnes					
			a) Labour					
			Mate	day	0.080	582.53	46.60	L-12
			Mazdoor for loading and unloading	day	2.000	529.57	1059.14	L-13
			b) Machinery					
			Truck 10 tonne capacity	hour	2.000	1006.18	2012.37	P&M-057
			c) Overhead charges @ 10% on (a+b)				311.81	
			d) Contractor's profit @ 16% on (a+b+c)				548.79	
			Cost for 10 tonnes = a+b+c+d				3978.71	
			Rate per tonnes = (a+b+c+d)/10				397.87	
						say	398.00	
1.4			Cost of Haulage Excluding Loading and Unloading					
			Haulage of materials by tipper excluding cost of loading, unloading and stacking.					
			Unit = t.km					
			Taking output 10 tonnes load and lead 10 km = 100 t.km					
		(i)	Surfaced Road					
			Speed with load : 25 km / hour.					
			Speed while Returning empty : 35 km / hour.					
			a) Machinery.					
			Tipper 10 tonne capacity					
			Time taken for onward haulage with load	hour	0.400	1006.18	402.47	P&M-048
			Time taken for empty return trip.	hour	0.290	1006.18	291.79	P&M-048
			b) Overhead charges @ 10% on (a)				69.43	
			c) Contractor's profit @ 16% on (a+b)				122.19	
			cost for 100 t km = a+b+c				885.88	
			Rate per t.km = (a+b+c)/100				8.86	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
						say	<u>8.90</u>	
1.4		(ii)	Unsurfaced Graveled Road					
			Speed with load: 20 km / hour					
			Speed for empty return trip :30 km / hour					
		a)	Machinery					
			Tipper 10 tonnes capacity					
			Time taken for onward haulage with load	hour	0.500	1006.18	503.09	P&M-048
			Time taken for empty return trip	hour	0.330	1006.18	332.04	P&M-048
		b)	Overhead charges @ 10% on (a)				83.51	
		c)	Contractor's profit @ 16% on (a+b)				146.98	
			Cost for 100 t .km = a+b+c				1065.63	
			Rate per t.Km = (a+b+c)/100				10.66	
						say	<u>10.70</u>	
1.4		(iii)	Katcha Track and Track in River Bed/Nallah Bed and Choe Bed.					
			Speed with load :10 km / hour					
			Speed while returning empty:15 km / hour					
		a)	Machinery					
			Tipper 10 tonnes capacity					
			Time taken for onward haulage	hour	1.000	1006.18	1006.18	P&M-048
			Time taken for empty return trip	hour	0.670	1006.18	674.14	P&M-048
		b)	Overhead charges @ 10% on (a)				168.03	
		c)	Contractor's profit @ 16% on (a+b)				295.74	
			Cost for 100 t .km = a+b+c				2144.10	
			Rate per t.Km = (a+b+c)/100				21.44	
						say	<u>21.40</u>	
1.5			Hand Broken Stone Aggregates 63 mm Nominal Size					
			Supply of quarried stone, hand breaking into coarse aggregate 63 mm nominal size (passing 80 mm and retained on 50 mm sieve) and stacking as directed					
			Unit = cum					
			Taking output = 1 cum					
		a)	Labour					
			Mate	day	0.060	582.53	34.95	L-12
			Mazdoor	day	1.500	529.57	794.35	L-13
		b)	Material					
			Supply of quarried stone 150 - 200 mm size	cum	1.100	1138.58	1252.43	M-002
		c)	Overhead charges @ 10% on (a+b)				208.17	
		d)	Contractor's profit @ 16% on (a+b+c)				366.39	
			Rate per cum = a+b+c+d				2656.30	
						say	<u>2656.00</u>	
1.6			Crushing of Stone Aggregates 13.2 mm Nominal Size.					
			Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 13.2 mm nominal size.					
			Unit = cum					
			Taking Output = 600 cum at crusher location.					
		a)	Labour					
			Mate	day	0.760	582.53	442.72	L-12
			Mazdoor Skilled	day	2.000	582.53	1165.05	L-14
			Mazdoor including breaking of any oversize boulder.	day	17.000	529.57	9002.69	L-13
		b)	Material					
			Stone Boulder of size 150 mm and below	cum	800.000	1138.58	910860.22	M-001
		c)	Machinery					
			Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	16851.97	101111.84	P&M-028
			Front end loader 1 cum bucket capacity	Hour	20.000	930.98	18619.68	P&M-017

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Tipper 5.5 cum capacity	Hour	20.000	1006.18	20123.66	P&M-048
		d) Overhead charges @ 10% on (a+b+c)				106132.58	
		e) Contractor's profit @ 16% on (a+b+c+d)				186793.35	
		Cost for 600 cum = a+b+c+d+e				1354251.78	
		Rate per cum = (a+b+c+d+e)*0.95/600				2144.23	
					say	2144.00	
	Note	1. 800 cum of stone boulders are needed to get 600 cum of stone chips of size 13.2 mm.					
		2. 95 per cent of above cost will be attributed to the production of 600 cum of stone chips of 13.2 mm size and balance 5 per cent to the production of stone dust which comes out as a by-product.					
		3. The integrated stone crusher includes primary and secondary crushing units.					
1.7		Crushing of Stone Aggregates 20 mm Nominal Size					
		Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 20 mm nominal size.					
		Unit = cum					
		Taking Output = 670 cum at crusher location.					
		a) Labour					
		Mate	day	0.760	582.53	442.72	L-12
		Mazdoor Skilled	day	2.000	582.53	1165.05	L-14
		Mazdoor including breaking of any size boulder.	day	17.000	529.57	9002.69	L-13
		b) Material					
		Stone Boulder of size 150 mm and below	cum	800.000	1138.58	910860.22	M-001
		c) Machinery					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	16851.97	101111.84	P&M-028
		Front end loader 1 cum bucket capacity	Hour	20.000	930.98	18619.68	P&M-017
		Tipper 5.5 cum capacity	Hour	20.000	1006.18	20123.66	P&M-048
		d) Overhead charges @ 10% on (a+b+c)				106132.58	
		e) Contractor's profit @ 16% on (a+b+c+d)				186793.35	
		Cost for 670 cum = a+b+c+d+e				1354251.78	
		Rate per cum = (a+b+c+d+e)*0.90/670				1819.14	
					say	1819.00	
	Note	1. 800 cum of stone boulders are needed to get 600 cum of stone chips of size 20 and 40 mm.					
		2. 90 per cent of above cost will be attributed to the production of 670 cum of stone aggregates of 20mm size and balance 10 per cent will be for smaller size aggregates and stone dust which comes out as a by-product.					
		3. The integrated stone crusher includes primary and secondary crushing units.					
1.8		Crushing of Stone Aggregates 40 mm Nominal Size					
		Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 40 mm nominal size.					
		Unit = cum					
		Taking Output = 750 cum at crusher location.					
		a) Labour					
		Mate	day	0.760	582.53	442.72	L-12
		Mazdoor Skilled	day	2.000	582.53	1165.05	L-14
		Mazdoor	day	17.000	529.57	9002.69	L-13
		b) Material					
		Stone Boulder of size 150 mm and below	cum	800.000	1138.58	910860.22	M-001
		c) Machinery					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	16851.97	101111.84	P&M-028

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Front end loader 1 cum bucket capacity	Hour	20.000	930.98	18619.68	P&M-017
			Tipper 5.5 cum capacity	Hour	20.000	1006.18	20123.66	P&M-048
			d) Overhead charges @ 10% on (a+b+c)				106132.58	
			e) Contractor's profit @ 16% on (a+b+c+d)				186793.35	
			Cost for 750 cum = (a+b+c+d+e)x0.85				1151114.02	
			Rate per cum = (a+b+c+d+e)x0.85/750				1534.82	
						say	<u>1535.00</u>	
		Note	1. 800 cum of stone boulders are needed to get 600 cum of stone chips of size 13.2 mm.					
			2. 85 per cent of above cost will be attributed to the production of 750 cum of stone aggregates of 40mm size and balance 15 per cent will be for smaller size aggregates and stone dust which comes out as a by-product.					
			3. The integrated stone crusher includes primary and secondary crushing units.					

CHAPTER-2								
SITE CLEARANCE								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.1	201		Cutting of Trees, including cutting of Trunks, Branches and Removal					
			Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 metres and earth filling in the depression/pit.					
			Unit = Each					
		(i)	Girth from 300 mm to 600 mm					
			a) Labour					
			Mate	day	0.020	582.53	11.65	L-12
			Mazdoors for cutting trees including cutting, refilling, compaction of backfilling and stacking of serviceable materials within 1000 metres lead by manual means.	day	0.600	529.57	317.74	L-13
			b) Machinery					
			Tractor-trolley	hour	0.100	357.99	35.80	P&M-053
			c) Overhead charges @ 10% on (a+b)				36.52	
			d) Contractor's profit @ 16% on (a+b+c)				64.27	
			Rate for each tree = a+b+c+d				465.98	
						say	466.00	
2.1		(ii)	Girth from 600 mm to 900 mm					
			a) Labour					
			Mate	day	0.040	582.53	23.30	L-12
			Mazdoors for cutting trees including cutting, refilling, compaction of backfilling, and stacking of serviceable materials within 1000 metres lead by manual means	day	0.900	529.57	476.61	L-13
			b) Machinery					
			Tractor-trolley	hour	0.300	357.99	107.40	P&M-053
			c) Overhead charges @ 10% on (a+b)				60.73	
			d) Contractor's profit @ 16% on (a+b+c)				106.89	
			Rate for each tree = a+b+c+d				774.93	
						say	775.00	
2.1		(iii)	Girth from 900 mm to 1800 mm					
			a) Labour					
			Mate	day	0.080	582.53	46.60	L-12
			Mazdoors for cutting trees including cutting, refilling, compaction of backfilling and stacking of serviceable materials within 1000 metres	day	2.000	529.57	1059.14	L-13
			b) Machinery					
			Tractor-trolley	hour	0.400	357.99	143.20	P&M-053
			c) Overhead charges @ 10% on (a+b)				124.89	
			d) Contractor's profit @ 16% on (a+b+c)				219.81	
			Rate for each tree = a+b+c+d				1593.64	
						say	1594.00	
2.1		(iv)	Girth above 1800 mm					
			a) Labour					
			Mate	day	0.160	582.53	93.20	L-12
			Mazdoors for cutting trees including cutting, refilling, compaction of backfilling and stacking of serviceable materials within 1000 metres	day	4.000	529.57	2118.28	L-13
			b) Machinery					
			Tractor-trolley	hour	0.600	357.99	214.79	P&M-053
			c) Overhead charges @ 10% on (a+b)				242.63	
			d) Contractor's profit @ 16% on (a+b+c)				427.02	
			Rate for each tree = a+b+c+d				3095.93	
						say	3096.00	
2.2	201		Clearing Grass and Removal of Rubbish					
			Clearing grass and removal of rubbish up to a distance of 50 metres outside the periphery of the area .					
			By Manual Means					
			Unit = Hectare					
			Taking output = 1 Hectare					
			a) Labour					
			Mate	day	2.000	582.53	1165.05	L-12
			Mazdoor	day	50.000	529.57	26478.49	L-13

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			b) Overhead charges @ 10% on (a)				2764.35	
			c) Contractor's profit @ 16% on (a+b)				4865.26	
			Rate per Hectare = a+b+c				35273.17	
						say	35273.00	
2.3	201		Clearing and Grubbing Road Land .					
			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					
			Unit = Hectare					
			Taking output = 1 Hectare					
		(i)	By Manual Means:-					
		A	In area of light jungle					
		a) Labour						
			Mate	day	6.000	582.53	3495.16	L-12
			Mazdoor	day	150.000	529.57	79435.48	L-13
		b) Machinery						
			Tractor-trolley	hour	1.000	357.99	357.99	P&M-053
		c) Overhead charges @ 10% on (a+b)					8328.86	
		d) Contractor's profit @ 16% on (a+b+c)					14658.80	
		Rate per Hectare = a+b+c+d					106276.30	
						say	106276.00	
2.3 (i)		B	In area of thorny jungle					
		a) Labour						
			Mate	day	8.000	582.53	4660.22	L-12
			Mazdoor	day	200.000	529.57	105913.98	L-13
		b) Machinery						
			Tractor-trolley	hour	2.000	357.99	715.98	P&M-053
		c) Overhead charges @ 10% on (a+b)					11129.02	
		d) Contractor's profit @ 16% on (a+b+c)					19587.07	
		Rate per Hectare = a+b+c+d					142006.26	
						say	142006.00	
2.3		(ii)	By Mechanical Means					
		A	In area of light jungle					
		a) Labour						
			Mate	day	0.160	582.53	93.20	L-12
			Mazdoor	day	4.000	529.57	2118.28	L-13
		b) Machinery						
			Dozer 80 HP with attachment for removal of trees & stumps	hour	10.000	3056.68	30566.77	P&M-014
			Tractor-trolley	hour	1.000	357.99	357.99	P&M-053
		c) Overhead charges @ 10% on (a+b)					3313.62	
		d) Contractor's profit @ 16% on (a+b+c)					5831.98	
		Rate per Hectare = a+b+c+d					42281.85	
						say	42282.00	
2.3 (ii)		B	In area of thorny jungle					
		a) Labour						
			Mate	day	0.240	582.53	139.81	L-12
			Mazdoor	day	6.000	529.57	3177.42	L-13
		b) Machinery						
			Dozer 80 HP with attachment for removal of trees & stumps	hour	12.000	3056.68	36680.13	P&M-014
			Tractor-trolley	hour	1.500	357.99	536.98	P&M-053
		c) Overhead charges @ 10% on (a+b)					4053.43	
		d) Contractor's profit @ 16% on (a+b+c)					7134.04	
		Rate per Hectare = a+b+c+d					51721.82	
						say	51722.00	
2.4	202		Dismantling of Structures					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres					
			<i>Unit = cum</i>					
			<i>Taking output = 1.25 cum</i>					
		(i)	Lime /Cement Concrete					
		I	By Manual Means					
		A	Lime Concrete, cement concrete grade M-10 and below					
		a)	Labour					
			Mate	day	0.040	582.53	23.30	L-12
			Mazdoor for dismantling and loading	day	1.000	529.57	529.57	L-13
		b)	Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
		c)	Overhead charges @ 10% on (a+b)				64.95	
		d)	Contractor's profit @ 16% on (a+b+c)				114.32	
			Cost for 1.25 cum = a+b+c+d				828.80	
			Rate per cum = (a+b+c+d)/ 1.25				663.04	
						say	<u>663.00</u>	
2.4 (i)		B	Cement Concrete Grade M-15 & M-20					
		a)	Labour					
			Mate	day	0.050	582.53	29.13	L-12
			Mazdoor for dismantling and loading	day	1.250	529.57	661.96	L-13
		b)	Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
		c)	Overhead charges @ 10% on (a+b)				78.77	
		d)	Contractor's profit @ 16% on (a+b+c)				138.64	
			Cost for 1.25 cum = a+b+c+d				1005.16	
			Rate per cum = (a+b+c+d)/ 1.25				804.13	
						say	<u>804.00</u>	
2.4 (i)		C	Prestressed / Reinforced cement concrete grade M-20 & above					
		a)	Labour					
			Mate	day	0.150	582.53	87.38	L-12
			Blacksmith	day	0.250	635.48	158.87	L-02
			Mazdoor for dismantling, loading and unloading	day	3.500	529.57	1853.49	L-13
		b)	Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
		c)	Overhead charges @ 10% on (a+b)				219.64	
		d)	Contractor's profit @ 16% on (a+b+c)				386.57	
			Cost for 1.25 cum = a+b+c+d				2802.61	
			Rate per cum = (a+b+c+d)/ 1.25				2242.09	
						say	<u>2242.00</u>	
2.4		II	By Mechanical Means for items No. 202(b)& (c)					
		A	Cement Concrete Grade M-15 & M-20					
		a)	Labour					
			Mate	day	0.020	582.53	11.65	L-12
			Mazdoor for loading and unloading	day	0.250	529.57	132.39	L-13
			Mazdoor with Pneumatic breaker	day	0.250	582.53	145.63	L-14
		b)	Machinery					
			Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1.5 cum per hour	hour	0.670	887.56	594.66	P&M-001
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
		c)	Overhead charges @ 10% on (a+b)				98.10	
		d)	Contractor's profit @ 16% on (a+b+c)				172.66	
			Cost for 1.25 cum = a+b+c+d				1251.75	
			Rate per cum = (a+b+c+d)/ 1.25				1001.40	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
						say	<u>1001.00</u>	
2.4 II		B	Prestressed / reinforced cement concrete grade M-20 & above					
		a)	Labour					
			Mate	day	0.050	582.53	29.13	L-12
			Mazdoor with Pneumatic breaker	day	0.660	582.53	384.47	L-14
			Blacksmith	day	0.250	635.48	158.87	L-02
			Mazdoor for loading and unloading	day	0.250	529.57	132.39	L-13
		b)	Machinery					
			Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1.00 cum per hour	hour	1.000	887.56	887.56	P&M-001
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
		c)	Overhead charges @ 10% on (a+b)				168.91	
		d)	Contractor's profit @ 16% on (a+b+c)				297.28	
			Cost for 1.25 cum = a+b+c+d				2155.26	
			Rate per cum = (a+b+c+d)/ 1.25				1724.21	
						say	<u>1724.00</u>	
2.4		(ii)	Dismantling Brick / Tile work					
		A	In lime mortar					
		a)	Labour					
			Mate	day	0.020	582.53	11.65	L-12
			Mazdoor for dismantling, loading and unloading	day	0.500	529.57	264.78	L-13
		b)	Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
		c)	Overhead charges @ 10% on (a+b)				37.31	
		d)	Contractor's profit @ 16% on (a+b+c)				65.66	
			Cost for 1.25 cum = a+b+c+d				476.07	
			Rate per cum = (a+b+c+d)/ 1.25				380.85	
						say	<u>381.00</u>	
2.4 (ii)		B	In cement mortar					
		a)	Labour					
			Mate	day	0.030	582.53	17.48	L-12
			Mazdoor for dismantling, loading and unloading	day	0.750	529.57	397.18	L-13
		b)	Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
		c)	Overhead charges @ 10% on (a+b)				51.13	
		d)	Contractor's profit @ 16% on (a+b+c)				89.99	
			Cost for 1.25 cum = a+b+c+d				652.43	
			Rate per cum = (a+b+c+d)/ 1.25				521.95	
						say	<u>522.00</u>	
2.4 (ii)		C	In mud mortar					
		a)	Labour					
			Mate	day	0.016	582.53	9.32	L-12
			Mazdoor for dismantling and loading	day	0.400	529.57	211.83	L-13
		b)	Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
		c)	Overhead charges @ 10% on (a+b)				31.78	
		d)	Contractor's profit @ 16% on (a+b+c)				55.93	
			Cost for 1.25 cum = a+b+c+d				405.52	
			Rate per cum = (a+b+c+d)/ 1.25				324.42	
						say	<u>324.00</u>	
2.4 (ii)		D	Dry brick pitching or brick soling					
		a)	Labour					
			Mate	day	0.014	582.53	8.16	L-12
			Mazdoor for Dismantling, loading and unloading	day	0.350	529.57	185.35	L-13
		b)	Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
		c)	Overhead charges @ 10% on (a+b)				29.02	
		d)	Contractor's profit @ 16% on (a+b+c)				51.07	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Cost for 1.25 cum = a+b+c+d				370.25	
			Rate per cum = (a+b+c+d)/ 1.25				296.20	
						say	<u>296.00</u>	
2.4		(iii)	Dismantling Stone Masonry					
		A	Rubble stone masonry in lime mortar					
			a) Labour					
			Mate	day	0.024	582.53	13.98	L-12
			Mazdoor for dismantling, loading and unloading.	day	0.600	529.57	317.74	L-13
			b) Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
			c) Overhead charges @ 10% on (a+b)				42.84	
			d) Contractor's profit @ 16% on (a+b+c)				75.39	
			Cost for 1.25 cum = a+b+c+d				546.61	
			Rate per cum = (a+b+c+d)/ 1.25				437.29	
						say	<u>437.00</u>	
2.4 (iii)		B	Rubble stone masonry in cement mortar.					
			a) Labour					
			Mate	day	0.030	582.53	17.48	L-12
			Mazdoor for dismantling, loading and unloading.	day	0.750	529.57	397.18	L-13
			b) Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
			c) Overhead charges @ 10% on (a+b)				51.13	
			d) Contractor's profit @ 16% on (a+b+c)				89.99	
			Cost for 1.25 cum = a+b+c+d				652.43	
			Rate per cum = (a+b+c+d)/ 1.25				521.95	
						say	<u>522.00</u>	
2.4 (iii)		C	Rubble Stone Masonry in mud mortar.					
			a) Labour					
			Mate	day	0.020	582.53	11.65	L-12
			Mazdoor for dismantling, loading and unloading.	day	0.500	529.57	264.78	L-13
			b) Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
			c) Overhead charges @ 10% on (a+b)				37.31	
			d) Contractor's profit @ 16% on (a+b+c)				65.66	
			Cost for 1.25 cum = a+b+c+d				476.07	
			Rate per cum = (a+b+c+d)/ 1.25				380.85	
						say	<u>381.00</u>	
2.4 (iii)		D	Dry rubble masonry					
			a) Labour					
			Mate	day	0.018	582.53	10.49	L-12
			Mazdoor for dismantling, loading and unloading.	day	0.450	529.57	238.31	L-13
			b) Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
			c) Overhead charges @ 10% on (a+b)				34.54	
			d) Contractor's profit @ 16% on (a+b+c)				60.80	
			Cost for 1.25 cum = a+b+c+d				440.79	
			Rate per cum = (a+b+c+d)/ 1.25				352.63	
						say	<u>353.00</u>	
2.4 (iii)		E	Dismantling stone pitching/ dry stone spalls.					
			a) Labour					
			Mate	day	0.016	582.53	9.32	L-12
			Mazdoor for dismantling, loading and unloading.	day	0.400	529.57	211.83	L-13
			b) Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
			c) Overhead charges @ 10% on (a+b)				31.78	
			d) Contractor's profit @ 16% on (a+b+c)				55.93	
			Cost for 1.25 cum = a+b+c+d				405.52	
			Rate per cum = (a+b+c+d)/ 1.25				324.42	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
						say	<u>324.00</u>	
2.4 (iii)		F	Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials.					
			a) Labour					
			Mate	day	0.020	582.53	11.65	L-12
			Mazdoor for dismantling, loading and unloading	day	0.500	529.57	264.78	L-13
			b) Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
			c) Overhead charges @ 10% on (a+b)				37.31	
			d) Contractor's profit @ 16% on (a+b+c)				65.66	
			Cost for 1.25 cum = a+b+c+d				476.07	
			Rate per cum = (a+b+c+d)/ 1.25				380.85	
						say	<u>381.00</u>	
2.4		(iv)	Wood Work wrought framed and fixed in frames of trusses upto a height of 5 m above plinth level					
			a) Labour					
			Mate	day	0.060	582.53	34.95	L-12
			Carpenter	day	0.500	635.48	317.74	L-04
			Mazdoor for dismantling, loading and unloading.	day	1.000	529.57	529.57	L-13
			b) Machinery					
			Tractor-trolley	hour	0.270	357.99	96.66	P&M-053
			c) Overhead charges @ 10% on (a+b)				97.89	
			d) Contractor's profit @ 16% on (a+b+c)				172.29	
			Cost for 1.25 cum = a+b+c+d				1249.10	
			Rate per cum = (a+b+c+d)/ 1.25				999.28	
						say	<u>999.00</u>	
2.4		(v)	Steel Work in all types of sections upto a height of 5 m above plinth level excluding cutting of rivet.					
			Unit = tonne					
			Taking output = 1 tonne					
		A	Including dismembering					
			a) Labour					
			Mate	day	0.140	582.53	81.55	L-12
			Blacksmith	day	1.000	635.48	635.48	L-02
			Mazdoor for dismantling, loading and unloading	day	2.500	529.57	1323.92	L-13
			Add 2.5 per cent of cost of labour for gas cutting, ropes, pulleys etc.				51.02	
			b) Machinery					
			Tractor-trolley	hour	0.170	357.99	60.86	P&M-053
			c) Overhead charges @ 10% on (a+b)				215.28	
			d) Contractor's profit @ 16% on (a+b+c)				378.90	
			Rate per tonne = a+b+c+d				2747.03	
						say	<u>2747.00</u>	
2.4 (v)		B	Excluding dismembering.					
			a) Labour					
			Mate	day	0.220	582.53	128.16	L-12
			Mazdoor for dismantling, loading and unloading	day	2.000	529.57	1059.14	L-13
			Blacksmith	day	0.500	635.48	317.74	L-02
			Add 2.5 per cent of cost of labour for gas cutting, ropes, pulleys etc.				37.63	
			b) Machinery					
			Tractor-trolley	hour	0.170	357.99	60.86	P&M-053
			c) Overhead charges @ 10% on (a+b)				160.35	
			d) Contractor's profit @ 16% on (a+b+c)				282.22	
			Rate per tonne = a+b+c+d				2046.09	
						say	<u>2046.00</u>	
2.4 (v)		C	Extra over item No (v) A and (v) B for cutting rivets.					
			Unit = each					
			Taking output = 10 rivets					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			a) Labour					
			Mate	day	0.010	582.53	5.83	L-12
			Blacksmith	day	0.130	635.48	82.61	L-02
			Mazdoor	day	0.130	529.57	68.84	L-13
			b) Overhead charges @ 10% on (a)				15.73	
			c) Contractor's profit @ 16% on (a+b)				27.68	
			Cost for 10 rivets = a+b+c				200.69	
			Rate for each rivet = (a+b+c)/10				20.07	
						say	<u>20.00</u>	
2.4		(vi)	Scraping of Bricks Dismantled from Brick Work including Stacking.					
			Unit = numbers					
			Taking output = 1000 numbers					
		A	In lime/Cement mortar					
			a) Labour					
			Mate	day	0.140	582.53	81.55	L-12
			Mazdoor	day	3.500	529.57	1853.49	L-13
			b) Overhead charges @ 10% on (a)				193.50	
			c) Contractor's profit @ 16% on (a+b)				340.57	
			Rate per 1000 Nos = a+b+c				2469.12	
						say	<u>2469.00</u>	
2.4 (iv)		B	In mud mortar					
			a) Labour					
			Mate	day	0.050	582.53	29.13	L-12
			Mazdoor	day	1.250	529.57	661.96	L-13
			b) Overhead charges @ 10% on (a)				69.11	
			c) Contractor's profit @ 16% on (a+b)				121.63	
			Rate per 1000 Nos = a+b+c				881.83	
						say	<u>882.00</u>	
2.4		(vii)	Scraping of Stone from Dismantled Stone Masonry					
			Unit = cum					
			Taking output = 1 cum					
		A	In cement and lime mortar					
			a) Labour					
			Mate	day	0.060	582.53	34.95	L-12
			Mazdoor	day	1.400	529.57	741.40	L-13
			b) Overhead charges @ 10% on (a)				77.63	
			c) Contractor's profit @ 16% on (a+b)				136.64	
			Rate per cum = a+b+c				990.62	
						say	<u>991.00</u>	
2.4 (vii)		B	In Mud mortar					
			a) Labour					
			Mate	day	0.010	582.53	5.83	L-12
			Mazdoor	day	0.300	529.57	158.87	L-13
			b) Overhead charges @ 10% on (a)				16.47	
			c) Contractor's profit @ 16% on (a+b)				28.99	
			Rate per cum = a+b+c				210.15	
						say	<u>210.00</u>	
2.4		(viii)	Scarping Plaster in Lime or Cement Mortar from Brick/ Stone Masonry					
			Unit = sqm					
			Taking output = 100 sqm					
			a) Labour					
			Mate	day	0.160	582.53	93.20	L-12
			Mazdoor for scarping and loading	day	4.000	529.57	2118.28	L-13
			b) Machinery					
			Tractor-trolley	hour	0.320	357.99	114.56	P&M-053
			c) Overhead charges @ 10% on (a+b)				232.60	
			d) Contractor's profit @ 16% on (a+b+c)				409.38	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Cost for 100 sqm = a+b+c+d				2968.03	
			Rate per sqm = (a+b+c+d)/100				29.68	
						say	<u>30.00</u>	
2.4		(ix)	Removing all type of Hume Pipes and Stacking within a lead of 1000 metres including Earthwork and Dismantling of Masonry Works.					
			Unit = metre					
			Taking output = 1 metre					
		A	Up to 600 mm dia					
			a) Labour					
			Mate	day	0.020	582.53	11.65	L-12
			Mazdoor	day	0.520	529.57	275.38	L-13
			b) Overhead charges @ 10% on (a)				28.70	
			c) Contractor's profit @ 16% on (a+b)				50.52	
			Rate per metre = a+b+c				366.25	
						say	<u>366.00</u>	
2.4 (ix)		B	Above 600 mm to 900 mm dia					
			a) Labour					
			Mate	day	0.030	582.53	17.48	L-12
			Mazdoor	day	0.700	529.57	370.70	L-13
			b) Overhead charges @ 10% on (a)				38.82	
			c) Contractor's profit @ 16% on (a+b)				68.32	
			Rate per metre = a+b+c				495.31	
						say	<u>495.00</u>	
2.4 (ix)		C	Above 900 mm					
			a) Labour					
			Mate	day	0.050	582.53	29.13	L-12
			Mazdoor	day	1.200	529.57	635.48	L-13
			b) Overhead charges @ 10% on (a)				66.46	
			c) Contractor's profit @ 16% on (a+b)				116.97	
			Rate per metre = a+b+c				848.04	
						say	<u>848.00</u>	
		Note	1. The excavation of earth, dismantling of stone masonry work in head walls and protection works is not included which is to be measured and paid separately.					
			2. Credit for retrieved stone from masonry work may be taken as per actual availability.					
2.5	202		Dismantling of Flexible Pavements					
			Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately					
			Unit = cum					
			Taking output = 1 cum					
		I	By Manual Means					
		A	Bituminous courses					
			a) Labour					
			Mate	day	0.060	582.53	34.95	L-12
			Mazdoor for dismantling, loading and unloading	day	1.500	529.57	794.35	L-13
			b) Machinery					
			Tractor-trolley	hour	0.380	357.99	136.04	P&M-053
			c) Overhead charges @ 10% on (a+b)				96.53	
			d) Contractor's profit @ 16% on (a+b+c)				169.90	
			Rate per cum = a+b+c+d				1231.78	
						say	<u>1232.00</u>	
2.5 I		B	Granular courses					
			a) Labour					
			Mate	day	0.040	582.53	23.30	L-12
			Mazdoor for dismantling, loading and unloading.	day	1.000	529.57	529.57	L-13
			b) Machinery					
			Tractor-trolley	hour	0.330	357.99	118.14	P&M-053

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			c) Overhead charges @ 10% on (a+b)				67.10	
			d) Contractor's profit @ 16% on (a+b+c)				118.10	
			Rate per cum = a+b+c+d				856.21	
						say	856.00	
2.5		II	By Mechanical Means					
		A	Bituminous course					
			a) Labour					
			Mate	day	0.010	582.53	5.83	L-12
			Mazdoor	day	0.300	529.57	158.87	L-13
			b) Machinery					
			Tractor-trolley	hour	0.380	357.99	136.04	P&M-053
			Farm tractor with ripper @ 60 cum per hour	hour	0.017	396.12	6.73	P&M-055
			c) Overhead charges @ 10% on (a+b)				30.75	
			d) Contractor's profit @ 16% on (a+b+c)				54.11	
			Rate per cum = a+b+c+d				392.33	
						say	392.00	
2.6	202		Dismantling of Cement Concrete Pavement					
			Dismantling of cement concrete pavement by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately					
			Unit = cum					
			Taking output = 1 cum					
			a) Labour					
			Mate	day	0.030	582.53	17.48	L-12
			Semi skilled mazdoor for operating pneumatic tools	day	0.500	582.53	291.26	L-14
			Mazdoors as helpers including loading and unloading	day	0.500	529.57	264.78	L-13
			b) Machinery					
			Air compressor 250 cfm with two leads for pneumatic cutters/ hammers @ 1 cum per hour	hour	1.000	887.56	887.56	P&M-001
			Tractor-trolley	hour	0.400	357.99	143.20	P&M-053
			Joint Cutting Machine with 2-3 blades	hour	1.000	448.02	448.02	P&M-083
			c) Overhead charges @ 10% on (a+b)				205.23	
			d) Contractor's profit @ 16% on (a+b+c)				361.20	
			Rate per cum = a+b+c+d				2618.73	
						say	2619.00	
		Note	The above analysis is for removal of complete pavement. In case full depth repair work is required to be done after dismantling, provision of a concrete cutting and sawing machine may be added for 0.25 hours.					
2.7	202		Dismantling of Guard Rails					
			Dismantling guard rails by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metres, stacking serviceable materials and unserviceable materials separately.					
			Unit = running metre					
			Taking output = 1 metre					
			a) Labour					
			Mate	day	0.006	582.53	3.50	L-12
			Mazdoor including loading and unloading	day	0.150	529.57	79.44	L-13
			b) Machinery					
			Tractor-trolley	hour	0.050	357.99	17.90	P&M-053
			c) Overhead charges @ 10% on (a+b)				10.08	
			d) Contractor's profit @ 16% on (a+b+c)				17.75	
			Rate per metre = a+b+c+d				128.66	
						say	129.00	
2.8	202		Dismantling of Kerb Stone					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Dismantling kerb stone by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre					
		<i>Unit = running metre</i>					
		<i>Taking output = 10 metre</i>					
		a) Labour					
		Mate	day	0.010	582.53	5.83	L-12
		Mazdoor including loading and unloading	day	0.150	529.57	79.44	L-13
		b) Machinery					
		Tractor-trolley	hour	0.200	357.99	71.60	P&M-053
		c) Overhead charges @ 10% on (a+b)				15.69	
		d) Contractor's profit @ 16% on (a+b+c)				27.61	
		Cost for 10 m = a+b+c+d				200.15	
		Rate per metre = (a+b+c+d)/10				20.02	
					say	20.00	
2.9	202	Dismantling of Kerb Stone Channel					
		Dismantling kerb stone channel by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre					
		<i>Unit = running metre</i>					
		<i>Taking output = 10 metre</i>					
		a) Labour					
		Mate	day	0.015	582.53	8.74	L-12
		Mazdoor including loading and unloading	day	0.225	529.57	119.15	L-13
		b) Machinery					
		Tractor-trolley	hour	0.300	357.99	107.40	P&M-053
		c) Overhead charges @ 10% on (a+b)				23.53	
		d) Contractor's profit @ 16% on (a+b+c)				41.41	
		Cost for 10 m = a+b+c+d				300.23	
		Rate per metre = (a+b+c+d)/10				30.02	
					say	30.00	
2.10	202	Dismantling of Kilometre Stone					
		Dismantling of kilometre stone including cutting of earth, foundation and disposal of dismantled material with all lifts and lead upto 1000 m and back filling of pit.					
		<i>Unit = Each</i>					
		<i>Taking output = one KM stone</i>					
	A	5th KM stone					
		Quantity of cement concrete = 0.392 cum					
		a) Labour					
		Mate	day	0.130	582.53	75.73	L-12
		Mazdoor	day	0.750	529.57	397.18	L-13
		b) Machinery					
		Tractor-trolley	hour	0.150	357.99	53.70	P&M-053
		c) Overhead charges @ 10% on (a+b)				52.66	
		d) Contractor's profit @ 16% on (a+b+c)				92.68	
		Rate for one 5th KM stone = a+b+c+d				671.95	
					say	672.00	
	B	Ordinary KM Stone					
		Quantity of cement concrete = 0.269 cum					
		a) Labour					
		Mate	day	0.020	582.53	11.65	L-12
		Mazdoor	day	0.500	529.57	264.78	L-13
		b) Machinery					
		Tractor-trolley	hour	0.100	357.99	35.80	P&M-053
		c) Overhead charges @ 10% on (a+b)				31.22	
		d) Contractor's profit @ 16% on (a+b+c)				54.95	
		Rate for one ordinary KM stone = a+b+c+d				398.41	
					say	398.00	
	C	Hectometre Stone					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Quantity of cement concrete = 0.048 cum					
		a) Labour					
		Mate	day	0.004	582.53	2.33	L-12
		Mazdoor	day	0.100	529.57	52.96	L-13
		b) Machinery					
		Tractor-trolley	hour	0.020	357.99	7.16	P&M-053
		c) Overhead charges @ 10% on (a+b)				6.24	
		d) Contractor's profit @ 16% on (a+b+c)				10.99	
		Rate for one Hectometre stone = a+b+c+d				79.68	
					say	80.00	
2.11	202	Dismantling of Fencing					
		Dismantling of barbed wire fencing/ wire mesh fencing including posts, foundation concrete, back filling of pit by manual means including disposal of dismantled material with all lifts and up to a lead of 1000 metres, stacking serviceable material and unserviceable material separately.					
		Unit = running metre					
		Taking output = 30 metres					
		a) Labour					
		Mate	day	0.150	582.53	87.38	L-12
		Mazdoor including loading and unloading	day	3.000	529.57	1588.71	L-13
		Blacksmith	day	0.750	635.48	476.61	L-02
		b) Machinery					
		Tractor-trolley	hour	0.150	357.99	53.70	P&M-053
		c) Overhead charges @ 10% on (a+b)				220.64	
		d) Contractor's profit @ 16% on (a+b+c)				388.33	
		Cost for 30 metres = a+b+c+d				2815.37	
		Rate per metre = (a+b+c+d)/30				93.85	
					say	94.00	
2.12	202	Dismantling of CI Water Pipe Line					
		Dismantling of CI water pipe line 600 mm dia including disposal with all lifts and lead upto 1000 metres and stacking of serviceable material and unserviceable material separately under supervision of concerned department					
		Unit = running metre					
		Taking output = 10 metres					
		a) Labour					
		Mate	day	0.090	582.53	52.43	L-12
		Mazdoor	day	2.000	529.57	1059.14	L-13
		Plumber	day	0.250	635.48	158.87	L-02
		b) Machinery					
		Truck 10 tonne capacity	hour	0.250	1006.18	251.55	P&M-057
		Light Crane 3 tonne capacity	hour	0.500	788.00	394.00	P&M-013
		c) Overhead charges @ 10% on (a+b)				191.60	
		d) Contractor's profit @ 16% on (a+b+c)				337.21	
		Cost for 10 metres = a+b+c+d				2444.80	
		Rate per metre = (a+b+c+d)/10				244.48	
					say	244.00	
		Note					
		The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.					
2.13	202	Removal of Cement Concrete Pipe of Sewer Gutter					
		Removal of cement concrete pipe of sewer gutter 1500 mm dia under the supervision of concerned department including disposal with all lifts and up to a lead of 1000 metres and stacking of serviceable and unserviceable material separately but excluding earth excavation and dismantling of masonry works.					
		Unit = running metre					
		Taking output = 10 metres					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.100	582.53	58.25	L-12
		Mazdoor	day	2.500	529.57	1323.92	L-13
		b) Machinery					
		Crane 5 tonne capacity	hour	0.300	510.45	153.14	P&M-070
		Truck flat body 10 tonne	hour	1.000	1006.18	1006.18	P&M-057
		c) Overhead charges @ 10% on (a+b)				254.15	
		d) Contractor's profit @ 16% on (a+b+c)				447.30	
		Cost for 10 metres = a+b+c+d				3242.95	
		Rate per metre = (a+b+c+d)/10				324.29	
					say	324.00	
		Note					
		The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.					
2.14	202	Removal of Telephone / Electric Poles and Lines					
		Removal of telephone / Electric poles including excavation and dismantling of foundation concrete and lines under the supervision of concerned department, disposal with all lifts and up to a lead of 1000 metres and stacking the serviceable and unserviceable material separately					
		Unit = each					
		Taking output = 30 Nos					
		a) Labour					
		Mate	day	0.480	582.53	279.61	L-12
		Mazdoor	day	10.000	529.57	5295.70	L-13
		Electrician/Lineman	day	2.000	635.48	1270.97	L-02
		b) Machinery					
		Tractor-trolley	hour	1.500	357.99	536.98	P&M-053
		c) Overhead charges @ 10% on (a+b)				738.33	
		d) Contractor's profit @ 16% on (a+b+c)				1299.45	
		Cost for 30 poles = a+b+c+d				9421.04	
		Rate per pole = (a+b+c+d)/30				314.03	
					say	314.00	

CHAPTER - 3								
EARTH WORK, EROSION CONTROL AND DRAINAGE								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.1	301		Excavation in Soil by Manual Means .					
			Excavation for roadway in soil using manual means including loading in truck for carrying of cut earth to embankment site with all lifts and lead upto 1000 metres.					
			Unit = cum					
			Taking output = 120 cum					
			a) Labour					
			Mate	day	1.800	582.53	1048.55	L-12
			Mazdoor	day	45.000	529.57	23830.65	L-13
			b) Machinery					
			Truck 5.5 cum capacity	hour	10.000	1006.18	10061.83	P&M-057
			c) Overhead charges @ 10% on (a+b)				3494.10	
			d) Contractor's profit @ 16% on (a+b+c)				6149.62	
			Cost of 120 cum = a+b+c+d				44584.74	
			Rate per cum = (a+b+c+d)/120				371.54	
						say	372.00	
		Note	In case there is a situation where the cross-section is of cut and fill and cut earth is required to be used in embankment in the immediate vicinity, the item of carriage in the truck shall be omitted.					
3.2	301		Excavation in Ordinary Rock by Manual Means					
			Excavation in ordinary rock using manual means including loading in a truck and carrying of excavated material to embankment site with in all lifts and leads upto 1000 metres					
			Unit = cum					
			Taking output = 120 cum					
			a) Labour					
			Mate	day	2.800	582.53	1631.08	L-12
			Mazdoor	day	70.000	529.57	37069.89	L-13
			b) Machinery					
			Truck 5.5 cum capacity	hour	10.000	1006.18	10061.83	P&M-057
			c) Overhead charges @ 10% on (a+b)				4876.28	
			d) Contractor's profit @ 16% on (a+b+c)				8582.25	
			Cost for 120 cum = a+b+c+d				62221.33	
			Rate per cum = (a+b+c+d)/120				518.51	
						say	519.00	
		Note	In case there is a situation where the cross-section is of cut and fill and cut earth is required to be used in embankment in the immediate vicinity, the item of carriage in the truck shall be omitted.					
3.3	301		Excavation in Soil with Dozer with lead upto 100 metres					
			Excavation for road way in soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 metres (average lead 50 metres), including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.					
			Unit = cum					
			Taking output = 180 cum					
			a) Labour					
			Mate	day	0.080	582.53	46.60	L-12
			Mazdoor	day	2.000	529.57	1059.14	L-13
			b) Machinery					
			Dozer, 80 HP @ 30 cum per hour	hour	6.000	3056.68	18340.06	P&M-014
			c) Overhead charges @ 10% on (a+b)				1944.58	
			d) Contractor's profit @ 16% on (a+b+c)				3422.46	
			Cost for 180 cum = a+b+c+d				24812.85	
			Rate per cum = (a+b+c+d)/180				137.85	
						say	138.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.4	301	Excavation in Ordinary Rock with Dozer with lead upto 100 metres					
		Excavation for roadway in ordinary rock by deploying a dozer, 80 HP including cutting and pushing the cut earth to site of embankment upto a distance of 100 metres (average lead 50 metres), trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.					
		Unit = cum					
		Taking output = 108 cum					
		a) Labour					
		Mate	day	0.120	582.53	69.90	L-12
		Mazdoor	day	3.000	529.57	1588.71	L-13
		b) Machinery					
		Dozer, 80 HP @ 20 cum per hour	hour	6.000	3056.68	18340.06	P&M-014
		c) Overhead charges @ 10% on (a+b)				1999.87	
		d) Contractor's profit @ 16% on (a+b+c)				3519.77	
		Cost for 108 cum = a+b+c+d				25518.31	
		Rate per cum = (a+b+c+d)/108				236.28	
					say	236.00	
3.5	301	Excavation in Hard Rock (requiring blasting) with disposal upto 1000 metres					
		Excavation for roadway in hard rock (requiring blasting) by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads upto 1000 metres					
		Unit = cum					
		Taking Output = 180 cum					
		a) Labour					
		Mate	day	0.220	582.53	128.16	L-12
		Mazdoor	day	3.000	529.57	1588.71	L-13
		Driller	day	2.000	635.48	1270.97	L-06
		Blaster	day	0.250	635.48	158.87	L-03
		b) Machinery					
		Dozer, 80 HP @ 30 cum per hour	hour	6.000	3056.68	18340.06	P&M-014
		Air compressor, 250 cfm with 2 jack hammer	hour	6.000	887.56	5325.35	P&M-001
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 10 tonne capacity	hour	11.250	1006.18	11319.56	P&M-048
		c) Materials					
		Gelatin 80 per cent	kg	63.000	406.76	25625.91	M-104
		Electric Detonators @ 1 detonator for 2 gelatin sticks of 125 gms each	each	252.000	2.69	677.93	M-094 /100
		Credit for excavated rock found suitable for use @ 50 per cent quantity blasted	cum	90.000	(194.91)	(17541.55)	M-089
		d) Overhead charges @ 10% on (a+b+c)				5247.99	
		e) Contractor's profit @ 16% on (a+b+c+d)				9236.46	
		Cost for 180 cum = a+b+c+d+e				66964.33	
		Rate per cum = (a+b+c+d+e)/180				372.02	
					say	372.00	
		Note					
		1. The quality and availability of rock shall be checked before affording credit.					
		2. In case some rock is issued to the contractor at site, the item of carriage shall be reduced/restricted to that extent.					
3.6	301	Excavation in Soil using Hydraulic Excavator CK 90 and Tippers with Disposal upto 1000 metres.					
		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					
		Unit = cum					
		Taking output = 360 cum					
		a) Labour					
		Mate	day	0.080	582.53	46.60	L-12

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor	day	2.000	529.57	1059.14	L-13
		b) Machinery					
		Hydraulic excavator 0.9 cum bucket capacity @ 60 cum per hour	hour	6.000	1444.67	8668.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	16.000	1006.18	16098.92	P&M-048
		c) Overhead charges @ 10% on (a+b)				2587.27	
		d) Contractor's profit @ 16% on (a+b+c)				4553.59	
		Cost for 360 cum = a+b+c+d				33013.52	
		Rate per cum = (a+b+c+d)/360				91.70	
					say	92.00	
3.7	301	Excavation in Ordinary Rock using Hydraulic Excavator CK-90 and Tippers with Disposal upto 1000 metres.					
		Excavation for roadway in ordinary rock with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, transporting to embankment site within all lifts and lead upto 1000 m, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.					
		Unit = cum					
		Taking output = 240 cum					
		a) Labour					
		Mate	day	0.080	582.53	46.60	L-12
		Mazdoor	day	2.000	529.57	1059.14	L-13
		b) Machinery					
		Hydraulic Excavator 0.90 cum bucket capacity @ 36 cum per hour	hour	6.000	1444.67	8668.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	11.000	1006.18	11068.01	P&M-048
		c) Overhead charges @ 10% on (a+b)				2084.18	
		d) Contractor's profit @ 16% on (a+b+c)				3668.15	
		Cost for 240 cum = a+b+c+d				26594.08	
		Rate per cum = (a+b+c+d)/240				110.81	
					say	111.00	
3.8	301	Excavation in Hard Rock (blasting prohibited)					
		Excavation for roadway in hard rock (blasting prohibited) with rock breakers including breaking rock, loading in tippers and disposal within all lifts and lead upto 1000 metres, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.					
	A	Mechanised					
		Unit = cum					
		Taking output = 36 cum					
		a) Labour					
		Mate	day	0.400	582.53	233.01	L-12
		Mazdoor for trimming slopes including manual loading in truck	day	10.000	529.57	5295.70	L-13
		b) Machinery					
		Hydraulic excavator with rock breaker attachment @ 6 cum per hour	hour	6.000	1444.67	8668.00	P&M-026
		Tipper 5.5 cum capacity, 1 trip per hour.	hour	6.500	1006.18	6540.19	P&M-048
		Credit for excavated rock found suitable for use @ 50 per cent of excavated quantity	cum	18.000	(194.91)	(3508.31)	M-089
		c) Overhead charges @ 10% on (a+b)				1722.86	
		d) Contractor's profit @ 16% on (a+b+c)				3032.23	
		Cost for 36 cum = a+b+c+d				21983.68	
		Rate per cum = (a+b+c+d)/36				610.66	
					say	611.00	
	Note	1. The quality and availability of rock shall be checked before affording credit.					
		2. In case some rock is issued to the contractor at site, the item of carriage shall be restricted/reduced to that extent.					
		3. Being small quantity, manual loading will be economical in this case and has been provided accordingly.					
3.8	B	Manual Method					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Unit = cum					
		Taking output = 16 cum					
		a) Labour					
		Mate	day	1.640	582.53	955.34	L-12
		Mazdoor including loading in truck	day	16.000	529.57	8473.12	L-13
		Chiseller	day	24.000	635.48	15251.61	L-05
		Blacksmith	day	1.000	635.48	635.48	L-02
		b) Machinery					
		Tipper 5.5 cum capacity, 1 trip per hour.	hour	2.900	1006.18	2917.93	P&M-048
		Credit for excavated rock found suitable for use @ 50 per cent of excavated	cum	8.000	(194.91)	(1559.25)	M-089
		c) Overhead charges @ 10% on (a+b)				2667.42	
		d) Contractor's profit @ 16% on (a+b+c)				4694.67	
		Cost for 16 cum = a+b+c+d				34036.33	
		Rate per cum = (a+b+c+d)/16				2127.27	
					say	2127.00	
		Note					
		1. Credit is considered for 50 per cent of quantity of work.					
		2. Loading for disposal will be done manually, being small quantity.					
		3. In case some rock is issued to contractor at site, the item of carriage shall be omitted to the extent of quantity issued to the contractor.					
3.9	301	Excavation in Hard Rock (controlled blasting) with disposal upto 1000 metres					
		Excavation for roadway in hard rock with controlled blasting by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads upto 1000 metres					
		Unit = cum					
		Taking output = 180 cum					
		a) Labour					
		Mate	day	0.220	582.53	128.16	L-12
		Mazdoor	day	3.000	529.57	1588.71	L-13
		Driller	day	2.000	635.48	1270.97	L-06
		Blaster	day	0.500	635.48	317.74	L-03
		b) Machinery					
		Dozer 80 HP @ 30 cum per hour	hour	6.000	3056.68	18340.06	P&M-014
		Air compressor, 250 cfm with 2 jack hammers	hour	6.000	887.56	5325.35	P&M-001
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	8.200	1006.18	8250.70	P&M-048
		c) Materials					
		Gelatin 80 per cent	kg	63.000	406.76	25625.91	M-104
		Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each	each	1008.000	2.69	2711.74	M-094 /100
		Credit for excavated rock found suitable for use @ 50 per cent quantity blasted	cum	90.000	(194.91)	(17541.55)	M-089
		Add 5 per cent of cost of a+b+c towards muffling arrangements to guard against any rock fly off during blasting				3457.26	
		d) Overhead charges @ 10% on (a+b+c)				5506.10	
		e) Contractor's profit @ 16% on (a+b+c+d)				9690.73	
		Cost for 180 cum = a+b+c+d+e				70257.79	
		Rate per cum = (a+b+c+d+e)/180				390.32	
					say	390.00	
		Note					
		1. Credit is considered for 50 per cent of quantity of blasted rock, if found suitable for construction..					
		2. In case some rock is issued to the contractor at site, the item of carriage shall be reduced to that extent.					
3.10	301	Excavation in Marshy Soil					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Excavation for roadway in marshy soil with hydraulic excavator 0.9 cum bucket capacity including cutting and loading in tippers and disposal with in all lifts and lead upto 1000 metres, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections.					
		Unit = cum					
		Taking output = 300 cum					
		a) Labour					
		Mate	day	0.080	582.53	46.60	L-12
		Mazdoor	day	2.000	529.57	1059.14	L-13
		b) Machinery					
		Hydraulic excavator 0.90 cum bucket capacity @ 50 cum per hour	hour	6.000	1444.67	8668.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	13.640	1006.18	13724.33	P&M-048
		c) Overhead charges @ 10% on (a+b)				2349.81	
		d) Contractor's profit @ 16% on (a+b+c)				4135.66	
		Cost for 300 cum = a+b+c+d				29983.54	
		Rate per cum = (a+b+c+d)/300				99.95	
					say	<u>100.00</u>	
3.11	301	Removal of Unserviceable Soil with Disposal upto 1000 metres					
		Removal of unserviceable soil including excavation, loading and disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid separately as per clause 305.					
		Unit = cum					
		Taking output = 360 cum					
		a) Labour					
		Mate	day	0.080	582.53	46.60	L-12
		Mazdoor	day	2.000	529.57	1059.14	L-13
		b) Machinery					
		Excavator 0.90 cum bucket capacity @ 60 cum per hour	hour	6.000	1444.67	8668.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	16.360	1006.18	16461.15	P&M-048
		c) Overhead charges @ 10% on (a+b)				2623.49	
		d) Contractor's profit @ 16% on (a+b+c)				4617.34	
		Cost for 360 cum = a+b+c+d				33475.72	
		Rate per cum = (a+b+c+d)/360				92.99	
					say	<u>93.00</u>	
		Note This item does not include replacement of unsuitable soil by suitable soil. Replacement, where required, is to be provided and paid separately under clause 305.					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.12	303		Presplitting of Rock Excavation Slopes					
			Carrying out excavation in hard rock to achieve a specified slope of the rock face by controlled use of explosives and blasting accessories in properly aligned and spaced drill holes, collection of the excavated rock by a 80 HP dozer, loading in tipper by a front end loader and disposing of the material with all lifts and lead upto 1000 m, all as specified in clause No. 303					
			Unit = sqm					
			Taking output = 400 sqm(120 cum considering 300mm average depth of excavation over the existing rock face)					
			a) Labour					
			Mate	day	0.600	582.53	349.52	L-12
			Mazdoor	day	15.000	529.57	7943.55	L-13
			b) Machinery					
			Air compressor 250 cfm with 2 leads @ 20 cum per hour	hour	6.000	887.56	5325.35	P&M-001
			Dozer, 80 HP	hour	6.000	3056.68	18340.06	P&M-014
			Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
			c) Materials					
			Gelatin 80 per cent	kg	42.000	406.76	17083.94	M-104
			Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each	each	672.000	2.69	1807.82	M-094 /100
			d) Overhead charges @ 10% on (a+b+c)				5643.62	
			e) Contractor's profit @ 16% on (a+b+c+d)				9932.76	
			Cost for 400 sqm = a+b+c+d+e				72012.53	
			Rate per sqm = (a+b+c+d+e)/400				180.03	
						say	180.00	
		Note	In case blasted rock is used to the contractor against payment for constructed work, the cost of carriage shall be reduced to that extent.					
3.13	304		Excavation for Structures					
			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, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.					
		(i)	Ordinary soil					
			Unit = cum					
			Taking output = 10 cum					
		A	Manual Means (Depth upto 3 m)					
			a) Labour					
			Mate	day	0.320	582.53	186.41	L-12
			Mazdoor	day	8.000	529.57	4236.56	L-13
			b) Overhead charges @ 10% on (a)				442.30	
			c) Contractor's profit @ 16% on (a+b)				778.44	
			Cost for 10 cum = a+b+c				5643.71	
			Rate per cum = (a+b+c)/10				564.37	
						say	564.00	
		Note	Cost of dewatering may be added where required upto 10 per cent of labour cost Assessment for dewatering shall be made as per site conditions..					
3.13 (i)		B	Mechanical Means (Depth upto 3 m)					
			Unit = cum					
			Taking output = 300 cum					
			a) Labour					
			Mate	day	0.320	582.53	186.41	L-12
			Mazdoor	day	8.000	529.57	4236.56	L-13
			b) Machinery					
			Hydraulic excavator 1.0 cum bucket capacity	hour	6.000	1444.67	8668.00	P&M-026
			c) Overhead charges @ 10% on (a+b)				1309.10	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			d) Contractor's profit @ 16% on (a+b+c)				2304.01	
			Cost for 300 cum = a+b+c+d				16704.07	
			Rate per cum = (a+b+c+d)/300				55.68	
						say	56.00	
		Note	Cost of dewatering upto 5 per cent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions..					
3.13		(ii)	Ordinary Rock (not requiring blasting)					
		A	Manual Means (Depth upto 3 m)					
			<i>Unit = cum</i>					
			<i>Taking output = 10 cum</i>					
			a) Labour					
			Mate	day	0.400	582.53	233.01	L-12
			Mazdoor	day	10.000	529.57	5295.70	L-13
			b) Overhead charges @ 10% on (a)				552.87	
			c) Contractor's profit @ 16% on (a+b)				973.05	
			Cost for 10 cum = a+b+c				7054.63	
			Rate per cum = (a+b+c)/10				705.46	
						say	705.00	
		Note	Cost of dewatering upto 10 per cent of labour cost may be added, where required. Assessment for dewatering shall be made as per site conditions..					
3.13 (ii)		B	Mechanical Means					
			<i>Unit = cum</i>					
			<i>Taking output = 216 cum</i>					
			a) Labour					
			Mate	day	0.240	582.53	139.81	L-12
			Mazdoor	day	6.000	529.57	3177.42	L-13
			b) Machinery					
			Hydraulic excavator 1.0 cum bucket capacity	hour	6.000	1444.67	8668.00	P&M-026
			c) Overhead charges @ 10% on (a+b)				1198.52	
			d) Contractor's profit @ 16% on (a+b+c)				2109.40	
			Cost for 216 cum = a+b+c+d				15293.15	
			Rate per cum = (a+b+c+d)/216				70.80	
						say	71.00	
		Note	1. Cost of dewatering upto 5 per cent of (a+b), may be added, where required Assessment for dewatering shall be made as per site conditions. 2. In case of rock, foundation beyond 3 m is not dug and hence not included.					
3.13		(iii)	Hard Rock (requiring blasting)					
		A	Manual Means					
			<i>Unit = cum</i>					
			<i>Taking output = 10 cum</i>					
			a) Labour					
			i) Mate	day	0.530	582.53	308.74	L-12
			ii) Driller	day	0.840	635.48	533.81	L-06
			iii) Blaster	day	0.400	635.48	254.19	L-03
			iv) Mazdoor	day	12.000	529.57	6354.84	L-13
			b) Machinery					
			Air Compressor 250 cfm with 2 jack hammer @ 15 cum per hour	hour	0.667	887.56	591.71	P&M-001
			c) Material					
			Blasting Material	kg	3.500	406.76	1423.66	M-104
			Detonator electric	each	14.000	2.69	37.66	M-094 /100
			d) Overhead charges @ 10% on (a+b+c)				950.46	
			e) Contractor's profit @ 16% on (a+b+c+d)				1672.81	
			Cost for 10 cum = a+b+c+d+e				12127.88	
			Rate per cum = (a+b+c+d+e)/10				1212.79	
						say	1213.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Note	Cost of dewatering @ 10 per cent of labour cost may be added, where required Assessment for dewatering shall be made as per site conditions.					
3.13		(iv)	Hard Rock (blasting prohibited)					
			<i>Unit = cum</i>					
			<i>Taking output = 10 cum</i>					
		A	Mechanical Means					
		a)	Labour					
			Mate	day	0.200	582.53	116.51	L-12
			Mazdoor	day	5.000	529.57	2647.85	L-13
		b)	Machinery					
			Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1 cum per hour	hour	10.000	887.56	8875.59	P&M-001
		c)	Overhead charges @ 10% on (a+b)				1163.99	
		d)	Contractor's profit @ 16% on (a+b+c)				2048.63	
			Cost for 10 cum = a+b+c+d				14852.57	
			Rate per cum = (a+b+c+d)/10				1485.26	
						say	<u>1485.00</u>	
		Note	1. Cost of dewatering upto 5 per cent of (a+b), may be added, where required Assessment for dewatering shall be made as per site conditions.					
			2. In case of rock, foundation beyond 3 m is not dug and hence not included.					
3.13		(v)	Marshy soil					
			<i>Unit = cum</i>					
			<i>Taking output = 10 cum</i>					
		A	Manual means (upto 3 m depth)					
		a)	Labour					
			Mate/Supervisor	day	0.400	582.53	233.01	L-12
			Mazdoor	day	10.000	529.57	5295.70	L-13
		b)	Machinery					
			Tractor-trolley	hour	2.670	357.99	955.83	P&M-053
		c)	Material					
			Selected earth for refilling	cum	5.000	154.69	773.44	M-163
		d)	Overhead charges @ 10% on (a+b+c)				725.80	
		e)	Contractor's profit @ 16% on (a+b+c+d)				1277.40	
			Cost for 10 cum = a+b+c+d+e				9261.18	
			Rate per cum = (a+b+c+d+e)/ 10				926.12	
						say	<u>926.00</u>	
		Note	1. Cost of dewatering @ 30 per cent of (a), may be added, where required Assessment for dewatering shall be made as per site conditions.					
			2. Shoring & strutting 20 per cent of (a), where required may be added					
			3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item (i) to (iv) for ordinary soil					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.13 (v)		B	Mechanical Means					
			a) Labour					
			i) Mate	day	0.080	582.53	46.60	L-12
			ii) Mazdoor for dressing sides, bottom and backfilling	day	2.000	529.57	1059.14	L-13
			b) Machinery					
			Hydraulic excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.170	1444.67	245.59	P&M-026
			Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.450	1006.18	452.78	P&M-048
			c) Material					
			Selected earth for refilling	cum	5.000	154.69	773.44	M-163
			d) Overhead charges @ 10% on (a+b+c)				257.76	
			e) Contractor's profit @ 16% on (a+b+c+d)				453.65	
			Cost for 10 cum = a+b+c+d+e				3288.96	
			Rate per cum = (a+b+c+d+e)/10				328.90	
						say	<u>329.00</u>	
		Note	1. Cost of dewatering @ 20 per cent of (a+b) may be added, where required					
			2. Shoring & strutting @ 10 per cent of (a+b), where required may be added					
			3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item (i) to (iv) for ordinary soil					
3.14	305.4.3		Scarifying Existing Granular Surface to a Depth of 50 mm by Manual Means					
			Scarifying the existing granular road surface to a depth of 50 mm and disposal of scarified material within all lifts and leads upto 1000 metres.					
			Unit = sqm					
			Taking output = 100 sqm					
			a) Labour					
			Mate	day	0.200	582.53	116.51	L-12
			Mazdoor including loading and unloading	day	5.000	529.57	2647.85	L-13
			b) Machinery					
			Tractor-trolley	hour	1.670	357.99	597.84	P&M-053
			d) Overhead charges @ 10% on (a+b+c)				336.22	
			e) Contractor's profit @ 16% on (a+b+c+d)				591.75	
			Cost for 100 sqm = a+b+c+d				4290.16	
			Rate per sqm = (a+b+c+d)/100				42.90	
						say	<u>43.00</u>	
		Note	In case material is to be reused at site, transportation cost catered above for disposal shall be deleted.					
3.15	305.4.3		Scarifying Existing Bituminous Surface to a depth of 50 mm by Mechanical Means					
			Scarifying the existing bituminous road surface to a depth of 50 mm and disposal of scarified material with in all lifts and lead upto 1000 metres.					
			Unit = sqm					
			Taking output = 100 sqm					
			a) Labour					
			Mate	day	0.010	582.53	5.83	L-12
			Mazdoor	day	0.250	529.57	132.39	L-13
			b) Machinery					
			Tractor with ripper attachment @ 60 cum per hour	hour	0.080	396.12	31.69	P&M-055
			Front end loader 1 cum bucket capacity @ 25 cum per hour	hour	0.200	930.98	186.20	P&M-017
			Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.230	1006.18	231.42	P&M-048
			c) Overhead charges @ 10% on (a+b)				58.75	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Contractor's profit @ 16% on (a+b+c)				103.40	
		Cost for 100 sqm = a+b+c+d				749.68	
		Rate per sqm = (a+b+c+d)/100				7.50	
					say	7.00	
3.16	305	Construction of Embankment with Material obtained from Borrowpits					
		Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet requirement of table 300-2.					
		Unit = cum					
		Taking output = 100 cum					
		a) Labour					
		Mate	day	0.040	582.53	23.30	L-12
		Mazdoor	day	1.000	529.57	529.57	L-13
		b) Machinery					
		Hydraulic Excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1444.67	2412.59	P&M-026
		Tipper 10 tonne capacity	tonne.km	160 x L	8.90	14234.84	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				1423.48	
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	3056.68	1528.34	P&M-014
		Motor grader for grading @ 100 cum per hour	hour	1.000	2324.81	2324.81	P&M-032
		Water tanker 6 KL capacity	hour	4.000	819.77	3279.10	P&M-060
		Vibratory roller 8-10 tonnes @ 100 cum per hour	hour	1.000	833.54	833.54	P&M-059
		c) Material					
		Cost of water	KL	24.000	529.57	12709.68	M-189
		Compensation for earth taken from private land	cum	100.000	10.59	1059.14	M-092
		d) Overhead charges @ 10% on (a+b+c)				4035.84	
		e) Contractor's profit @ 16% on (a+b+c+d)				7103.08	
		Cost for 100 cum = a+b+c+d+e				51497.31	
		Rate per cum = (a+b+c+d+e)/100				514.97	
					say	515.00	
		Note Compensation for earth will vary from place to place and will have to be assessed realistically as per particular ground situation. In case earth is available from Govt. land, compensation for earth will not be required. The position is required to be clearly stated in the cost estimate.					
3.17	305	Construction of Embankment with Material Deposited from Roadway Cutting					
		Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted to meet requirement of table 300-2.					
		Unit = cum					
		Taking output = 100 cum					
		a) Labour					
		Mate	day	0.020	582.53	11.65	L-12
		Mazdoor	day	0.500	529.57	264.78	L-13
		b) Machinery					
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	3056.68	1528.34	P&M-014
		Motor grader for grading @ 100 cum per hour	hour	1.000	2324.81	2324.81	P&M-032
		Water tanker 6 KL capacity	hour	4.000	819.77	3279.10	P&M-060
		Vibratory roller 8-10 tonnes @ 100 cum per hour	hour	1.000	833.54	833.54	P&M-059
		c) Material					
		Cost of water	KL	24.000	529.57	12709.68	M-189
		d) Overhead charges @ 10% on (a+b+c)				2095.19	
		e) Contractor's profit @ 16% on (a+b+c+d)				3687.53	
		Rate for 100 cum = a+b+c+d+e				26734.63	
		Rate per cum = (a+b+c+d+e)/100				267.35	
					say	267.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Note	In case the earth cutting is done by dozer and pushed for filling in the embankment, the input of dozer in the cost of embankment shall be deleted as the same is already provided in the cost of excavation. However, if the earth is dumped by tippers from roadway cutting, the input of dozer for spreading is required to be provided.					
3.18	305		Construction of Subgrade and Earthen Shoulders					
			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					
			Unit = cum					
			Taking output = 100 cum					
			a) Labour					
			Mate	day	0.040	582.53	23.30	L-12
			Mazdoor	day	1.000	529.57	529.57	L-13
			b) Machinery					
			Hydraulic excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1444.67	2412.59	P&M-026
			Tipper 10 tonne capacity	tonne.km	175xL	8.90	15569.35	Lead =10 km & P&M-058
			Add 10 per cent of cost of carriage to cover cost of loading and unloading				1556.94	
			Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	3056.68	1528.34	P&M-014
			Motor grader for grading @ 50 cum per hour	hour	2.000	2324.81	4649.62	P&M-032
			Water tanker with 6 km lead	hour	4.000	819.77	3279.10	P&M-060
			Vibratory roller 8-10 tonnes @ 80 cum per hour	hour	1.250	833.54	1041.93	P&M-059
			c) Material					
			Cost of water	KL	24.000	529.57	12709.68	M-189
			Compensation for earth taken from private land	cum	100.000	10.59	1059.14	M-092
			d) Overhead charges @ 10% on (a+b+c)				4435.96	
			e) Contractor's profit @ 16% on (a+b+c+d)				7807.28	
			Cost for 100 cum = a+b+c+d+e				56602.80	
			Rate per cum = (a+b+c+d+e)/100				566.03	
						say	566.00	
3.19	305.3.4		Compacting Original Ground					
		Case-I	Compacting original ground supporting sub-grade					
			Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers to meet requirement of table 300-2 for sub-grade construction.					
			Unit = cum					
			Taking output = 600 cum					
			a) Labour					
			Mate	day	0.120	582.53	69.90	L-12
			Mazdoor	day	3.000	529.57	1588.71	L-13
			b) Machinery					
			Tractor with ripper attachment	hour	9.000	396.12	3565.06	P&M-055
			Motor grader for grading	hour	6.000	2324.81	13948.87	P&M-032
			Water tanker 6 KL capacity	hour	4.000	819.77	3279.10	P&M-060
			Vibratory roller 8-10 tonne @ 80 cum/hour	hour	7.500	833.54	6251.57	P&M-059

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Material					
		Cost of water	KL	24.000	529.57	12709.68	M-189
		d) Overhead charges @ 10% on (a+b+c)				4141.29	
		e) Contractor's profit @ 16% on (a+b+c+d)				7288.67	
		Cost for 600 cum = a+b+c+d+e				52842.85	
		Rate per cum = (a+b+c+d+e)/600				88.07	
					say	<u>88.00</u>	
3.19		Case-II : Compacting original ground supporting embankment					
		Loosening, leveling and Compacting original ground supporting embankment to facilitate placement of first layer of embankment, scarified to a depth of 150 mm, mixed with water at OMC and then compacted by rolling so as to achieve minimum dry density as given in Table 300-2 for embankment construction.					
		Unit = cum					
		Taking output = 600 cum					
		a) Labour					
		Mate	day	0.080	582.53	46.60	L-12
		Mazdoor	day	2.000	529.57	1059.14	L-13
		b) Machinery					
		Tractor with ripper attachment	hour	6.000	396.12	2376.71	P&M-055
		Vibratory road roller 8-10 tonne capacity	hour	7.500	833.54	6251.57	P&M-059
		Water tanker 6 KL capacity	hour	4.000	819.77	3279.10	P&M-060
		c) Material					
		Cost of water	KL	24.000	529.57	12709.68	M-189
		d) Overhead charges @ 10% on (a+b+c)				2572.28	
		e) Contractor's profit @ 16% on (a+b+c+d)				4527.21	
		Cost for 600 cum = (a+b+c+d+e)				32822.29	
		Rate per sqm = (a+b+c+d+e)/600				54.70	
					say	<u>55.00</u>	
3.20	305	Stripping and Storing Top Soil					
		Stripping, storing of top soil by road side at 15 m internal and re-application on embankment slopes, cut slopes and other areas in localities where the available embankment material is not conducive to plant growth.					
		Unit = cum					
		Taking output = 10 cum					
		a) Labour					
		Mate	day	0.200	582.53	116.51	L-12
		Mazdoor	day	5.000	529.57	2647.85	L-13
		b) Machinery					
		Dozer 80 HP @ 100 cum per hour	hour	0.100	3056.68	305.67	P&M-014
		c) Overhead charges @ 10% on (a+b)				307.00	
		d) Contractor's profit @ 16% on (a+b+c)				540.32	
		Cost for 10 cum = (a+b+c+d)				3917.35	
		Rate per cum = (a+b+c+d)/10				391.73	
					say	<u>392.00</u>	
3.21		Stripping, Storing and Re-laying Top Soil from Borrow Areas in Agriculture Fields.					
		Stripping of top soil from borrow areas located in agriculture fields, storing at a suitable place, spreading and re-laying after taking the borrow earth to maintain fertility of the agricultural field, finishing it to the required levels and satisfaction of the farmer.					
		Unit = cum					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Taking output = 300 cum					
		a) Labour					
		Mate	day	0.080	582.53	46.60	L-12
		Mazdoor	day	2.000	529.57	1059.14	L-13
		b) Machinery					
		Dozer, 80 HP	hour	6.000	3056.68	18340.06	P&M-014
		c) Overhead charges @ 10% on (a+b)				1944.58	
		d) Contractor's profit @ 16% on (a+b+c)				3422.46	
		Cost for 300 cum = (a+b+c+d)				24812.85	
		Rate per cum = (a+b+c+d)/300				82.71	
					say	83.00	
3.22	307	Turfing with Sods					
		Furnishing and laying of the live sods of perennial turf forming grass on embankment slope, verges or other locations shown on the drawing or as directed by the engineer including preparation of ground, fetching of sods and watering.					
		Unit = sqm					
		Taking output = 100 sqm					
		a) Labour					
		Mate	day	0.120	582.53	69.90	L-12
		Mazdoor for preparation of ground and fetching of sods	day	3.000	529.57	1588.71	L-13
		b) Machinery					
		Water tanker including watering for 3 months	hour	2.000	819.77	1639.55	P&M-060
		Tractor-trolley	hour	1.000	357.99	357.99	P&M-053
		c) Material					
		Farm yard manure @ 0.18 cum per 100 sqm at site of work	cum	0.180	154.69	27.84	M-167
		Cost of water	KL	12.000	529.57	6354.84	M-189
		d) Overhead charges @ 10% on (a+b+c)				1003.88	
		e) Contractor's profit @ 16% on (a+b+c+d)				1766.83	
		Cost for 100 sqm = a+b+c+d+e				12809.55	
		Rate per 100 sqm = (a+b+c+d+e)/100				128.10	
					say	128.00	
3.23	308	Seeding and Mulching					
		Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, mulching material, applying bituminous emulsion at the rate of 0.23 litres per sqm and laying and fixing jute netting, including watering for 3 months all as per clause 308.					
		Unit = sqm					
		Taking output = 240 sqm					
		a) Labour					
		Mate	day	0.400	582.53	233.01	L-12
		Mazdoor	day	10.000	529.57	5295.70	L-13
		b) Machinery					
		Water tanker 6 KL capacity including watering for 3 months	hour	14.000	819.77	11476.84	P&M-060
		Tractor-trolley	hour	2.400	357.99	859.17	P&M-053
		c) Material					
		Seeds	kg	3.600	387.39	1394.61	M-162
		Sludge/Farm yard manure @ 0.18 cum per 100 sqm	cum	0.430	154.69	66.52	M-167
		Bitumen Emulsion	litre	55.200	64.90	3582.72	M-077
		Jute netting, open weave, 2.5 cm square opening	sqm	264.000	28.25	7457.28	M-121
		Cost of water for 3 months	KL	84.000	529.57	44483.87	M-189
		d) Overhead charges @ 10% on (a+b+c)				7484.97	
		e) Contractor's profit @ 16% on (a+b+c+d)				13173.55	
		Cost for 240 sqm = a+b+c+d+e				95508.23	
		Rate per sqm = (a+b+c+d+e)/240				397.95	
					say	398.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.24	309		Surface Drains in Soil					
			Construction of unlined surface drains of average cross sectional area 0.40 sqm in soil to specified lines, grades, levels and dimensions to the requirement of clause 301 and 309. Excavated material to be used in embankment within a lead of 50 metres (average lead 25 metres)					
			<i>Unit = metre</i>					
			<i>Taking output = 10 metres</i>					
		A	Mechanical means					
		a)	Labour					
			Mate	day	0.010	582.53	5.83	L-12
			Mazdoor for dressing of bed and side of drain	day	0.250	529.57	132.39	L-13
		b)	Machinery					
			Hydraulic Excavator 0.3 cum bucket capacity @ 30 metres per hour	hour	0.330	1444.67	476.74	P&M-026
		c)	Overhead charges @ 10% on (a+b)				61.50	
		d)	Contractor's profit @ 16% on (a+b+c)				108.23	
			Cost for 10 metres = a+b+c+d				784.69	
			Rate per metre = (a+b+c+d)/10				78.47	
						say	<u>78.00</u>	
3.24		B	Manual Means					
		a)	Labour					
			Mate	day	0.080	582.53	46.60	L-12
			Mazdoor	day	2.000	529.57	1059.14	L-13
		b)	Overhead charges @ 10% on (a)				110.57	
		c)	Contractor's profit @ 16% on (a+b)				194.61	
			Cost for 10 metres = a+b+c				1410.93	
			Rate per metre = (a+b+c)/10				141.09	
						say	<u>141.00</u>	
		Note	Where lining of drain is provided, quantity shall be worked out based on approved design and drawing and priced on rate of cement concrete of approved grade or stone/brick masonry as the case may be.					
3.25	309		Surface Drains in Ordinary Rock					
			Construction of unlined surface drain of average cross sectional area 0.4 sqm in ordinary rock to specified lines, grades, levels and dimensions as per approved design and to the requirement of clause 301 to 309. Excavated material to be used in embankment at site.					
			<i>Unit = metre</i>					
			<i>Taking output = 10 metres</i>					
		A	Mechanical Means					
		a)	Labour					
			Mate	day	0.020	582.53	11.65	L-12
			Mazdoor for dressing of bed and side of drain	day	0.500	529.57	264.78	L-13
		b)	Machinery					
			Hydraulic Excavator 0.3 cum bucket capacity @ 15 metres per hour	hour	0.670	1444.67	967.93	P&M-026
		c)	Overhead charges @ 10% on (a+b)				124.44	
		d)	Contractor's profit @ 16% on (a+b+c)				219.01	
			Cost for 10 metres = a+b+c+d				1587.81	
			Rate per metre = (a+b+c+d)/10				158.78	
						say	<u>159.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.25		B	Manual Means					
			a) Labour					
			Mate	day	0.120	582.53	69.90	L-12
			Mazdoor	day	3.000	529.57	1588.71	L-13
			b) Overhead charges @ 10% on (a)				165.86	
			c) Contractor's profit @ 16% on (a+b)				291.92	
			Cost for 10 metres = a+b+c				2116.39	
			Rate per metre = (a+b+c)/10				211.64	
						say	212.00	
3.26	309		Surface Drains in Hard Rock					
			Rate per metre may be worked out based on quantity of hard rock as per design.					
			For rate of hard rock cutting, refer relevant item in this chapter					
3.27	309		Sub-Surface Drains with Perforated Pipe					
			Construction of subsurface drain with perforated pipe of 100 mm internal diameter of metal/ asbestos cement/ cement concrete/PVC, closely jointed, perforations ranging from 3 mm to 6 mm depending upon size of material surrounding the pipe, with 150 mm bedding below the pipe and 300 mm cushion above the pipe, cross section of excavation 450 x 550 mm. Excavated material to be utilised in roadway at site					
			Unit = metre					
			Taking output = 10 metres					
			a) Labour					
			Mate	day	0.040	582.53	23.30	L-12
			Mazdoor for excavation and back filling	day	2.000	529.57	1059.14	L-13
			c) Material					
			Perforated pipe of cement concrete, internal dia 100 mm	metre	10.000	295.92	2959.24	M-135
			Crushed stone as per table 300-3	cum	2.400	12281.20	29474.89	M-012
			d) Overhead charges @ 10% on (a+b+c)				3351.66	
			e) Contractor's profit @ 16% on (a+b+c+d)				5898.92	
			Cost for 10 metres = a+b+c+d+e				42767.13	
			Rate per metre = (a+b+c+d+e)/10				4276.71	
						say	4277.00	
		Note	Type of pipe may be modified depending upon provision in design.					
3.28	309		Aggregate Sub-Surface Drains					
			Construction of aggregate sub surface drain 300 mm x 450 mm with aggregates conforming to table 300-4, excavated material to be utilised in roadway.					
			Unit = metre					
			Taking output = 10 metres					
			a) Labour					
			Mate	day	0.020	582.53	11.65	L-12
			Mazdoor for excavation and back filling with aggregates	day	1.500	529.57	794.35	L-13
			b) Material					
			Crushed stone as per table 300-3	cum	1.350	12281.20	16579.62	M-012
			c) Overhead charges @ 10% on (a+b)				1738.56	
			d) Contractor's profit @ 16% on (a+b+c)				3059.87	
			Cost for 10 metres = a+b+c+d				22184.06	
			Rate per metre = (a+b+c+d)/10				2218.41	
						say	2218.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.29	309	Underground Drain at Edge of Pavement					
		Construction of an underground drain 1 m x 1 m (inside dimensions) lined with RCC-20 cm thick and covered with RCC slab 10 cm in thickness on urban roads.					
		Unit = Running metre					
		Taking output = one metre					
		a) Earthwork in soil	cum	1.500	56.00	84.00	Item No. 3.13
		b) RCC work M-20	cum	0.495	10038.00	4968.81	Item 12.8 (C) RCC
		Rate per metre = (a+b)				5052.81	
		Rates for these items may be taken from chapters on earth work and substructures respectively.			say	5053.00	
3.30	310	Preparation and Surface Treatment of Formation.					
		Preparation and surface treatment of formation by removing mud and slurry, watering to the extent needed to maintain the desired moisture content, trimming to the required line, grade, profile and rolling with 8-10 tonne smooth wheeled roller, complete as per clause 310.					
		Unit = sqm					
		Taking output = 3500sqm					
		a) Labour					
		Mate	day	0.280	582.53	163.11	L-12
		Mazdoor	day	6.000	529.57	3177.42	L-13
		Mazdoor skilled	day	1.000	688.44	688.44	L-15
		b) Machinery					
		Smooth 3 wheeled steel roller 8-10 tonnes	hour	3.000	510.51	1531.52	P&M-044
		Water tanker 6 KL, one trip per hour	hour	3.000	819.77	2459.32	P&M-060
		c) Material					
		Cost of water	KL	18.000	529.57	9532.26	M-189
		d) Overhead charges @ 10% on (a+b+c)				1755.21	
		e) Contractor's profit @ 16% on (a+b+c+d)				3089.16	
		Cost for 3500 sqm = a+b+c+d+e				22396.43	
		Rate per sqm = (a+b+c+d+e)/3500				6.40	
					say	6.40	
3.31	313	Construction of Rock fill Embankment					
		Construction of rock fill embankment with broken hard rock fragments of size not exceeding 300 mm laid in layers not exceeding 500 mm thick including filling of surface voids with stone spalls, blinding top layer with granular material, rolled with vibratory road roller, all complete as per clause 313.					
		Unit = cum					
		Taking output = 100 cum					
		a) Labour					
		Mate	day	0.040	582.53	23.30	L-12
		Mazdoor	day	1.500	529.57	794.35	L-13
		b) Machinery					
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	3056.68	1528.34	P&M-014
		Vibratory road roller 8-10 tonnes @ 100 cum per hour	hour	1.000	833.54	833.54	P&M-059
		Water tanker 6 KL, one trip per hour	hour	2.000	819.77	1639.55	P&M-060
		c) Material					
		Cost of water	KL	12.000	529.57	6354.84	M-189
		d) Overhead charges @ 10% on (a+b+c)				1117.39	
		e) Contractor's profit @ 16% on (a+b+c+d)				1966.61	
		Cost for 100 cum = a+b+c+d+e				14257.93	
		Rate per cum = (a+b+c+d+e)/100				142.58	
					say	143.00	
		Note It is assumed that rock is available locally at site from roadway cutting. In case, portion of the rock requires breaking to acceptable size of 300 mm, breaking charges will have to be added.					
		EARTH WORK ON HILL ROAD					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.32	301		Excavation in Hill Area in Soil by Mechanical Means					
			Excavation in soil in hilly area by mechanical means including cutting and trimming of side slopes and disposing of excavated earth with all lifts and lead upto 1000 metres.					
			<i>Unit = cum</i>					
			<i>Taking output = 260 cum</i>					
			a) Labour					
			Mate	day	0.240	582.53	139.81	L-12
			Mazdoor for trimming slopes and helping in excavation etc.	day	6.000	529.57	3177.42	L-13
			b) Machinery					
			Dozer 80 HP (D-80 A 12)@ 43.28 cum per hour	hour	6.000	3056.68	18340.06	P&M-014
			Front end loader	hour	6.000	930.98	5585.90	P&M-017
			Tipper 5.5cum capacity, 4 trips per hour.	hour	12.000	1006.18	12074.19	P&M-048
			c) Overhead charges @ 10% on (a+b)				3931.74	
			d) Contractor's profit @ 16% on (a+b+c)				6919.86	
			Cost for 260 cum = a+b+c+d				50168.99	
			Rate per cum = (a+b+c+d)/260				192.96	
						say	193.00	
		Note	In case the land on the valley side is barren and there is no objection for disposing of excavated earth on the valley side, the provision of front end loader and tipper shall be deleted as excavated earth shall be disposed off on the valley side.					
3.33	301		Excavation in Hilly Area in Ordinary Rock by Mechanical Means not Requiring Blasting.					
			Excavation in hilly area in ordinary rock not requiring blasting by mechanical means including cutting and trimming of slopes and disposal of cut material with all lift and lead upto 1000 metres.					
			<i>Unit = cum</i>					
			<i>Taking output = 170 cum</i>					
			a) Labour					
			Mate	day	0.320	582.53	186.41	L-12
			Mazdoor	day	8.000	529.57	4236.56	L-13
			b) Machinery					
			Dozer 80 HP (D-80 A 12)@ 28.32 cum per hour	hour	6.000	3056.68	18340.06	P&M-014
			Front end loader	hour	7.000	930.98	6516.89	P&M-017
			Tipper 5.5cum capacity, 4 trips per hour.	hour	7.000	1006.18	7043.28	P&M-048
			c) Overhead charges @ 10% on (a+b)				3632.32	
			d) Contractor's profit @ 16% on (a+b+c)				6392.88	
			Cost for 170 cum = a+b+c+d				46348.40	
			Rate per cum = (a+b+c+d)/170				272.64	
						say	273.00	
		Note	In case the land on the valley side is barren and there is no objection for disposing of excavated earth on the valley side, the provision of front end loader and tipper shall be deleted as excavated earth can be disposed off on the valley side.					
3.34	301		Excavation in Hilly Areas in Hard Rock Requiring Blasting					
			Excavation in hilly areas in hard rock requiring blasting, by mechanical means including trimming of slopes and disposal of cut material with all lifts and lead upto 1000 metres.					
			<i>Unit = cum</i>					
			<i>Taking output = 170 cum</i>					
			a) Labour					
			Mate	day	0.490	582.53	285.44	L-12
			Mazdoor	day	10.000	529.57	5295.70	L-13
			Driller	day	2.000	635.48	1270.97	L-06
			Blaster	day	0.250	635.48	158.87	L-03
			b) Machinery					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Dozer 80 HP (D-80 A 12) @ 28.32 cum per hour	hour	6.000	3056.68	18340.06	P&M-014
		Air compressor 250 cfm with two jack hammer @ 20 cum per hour	hour	5.000	887.56	4437.80	P&M-001
		Front end loader	hour	7.000	930.98	6516.89	P&M-017
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	7.000	1006.18	7043.28	P&M-048
		c) Materials					
		Gelatine 80 per cent	kg	35.000	406.76	14236.62	M-104
		Electric Detonators @ 1 Detonator for 2 Gelatine sticks of 125 gms each	each	140.000	2.69	376.63	M-094 /100
		d) Overhead charges @ 10% on (a+b+c)				5796.23	
		e) Contractor's profit @ 16% on (a+b+c+d)				10201.36	
		Cost for 170 cum = a+b+c+d+e				73959.83	
		Rate per cum = (a+b+c+d+e)/170				435.06	
					say	435.00	
		Note In case the land on the valley side is barren and there is no objection for disposing of excavated earth on the valley side, the provision of front end loader and tipper shall be deleted as excavated earth can be disposed off on the valley side.					
		In case of hill roads, the altitude effect comes into play. The output of men and machines decreases progressively after 2100 m elevation leading to increase in cost. High altitude effect has been explained in the basic approach.					
3.35		Work in Urban Roads					
		The cost of earth work in urban roads inhabited area will be comparatively higher due to following reasons:					
		a) There is mixed traffic on urban roads like slow moving hand and animal driven carts, rickshaws, cycles, two/ three wheeler apart from the usual vehicular traffic resulting into traffic jams. This causes loss of working time which may be in the range of 10 -15 per cent					
		b) There is considerable disruption of traffic adversely affecting the efficiency of the working parties including machines due to congestion caused by pedestrian traffic, local road side vendors, parking of vehicles by the road side, encroachments by the shopkeepers and local shops who make use of the berms of the road in front of these shops and unauthorised conversion of road berms into mini local market. The output of manpower and machines is substantially reduced due to factors mentioned above					
		c) Cost of living in urban areas is comparatively more resulting into higher wages.					
		d) At times, work is executed during night time due to heavy traffic during day time. This involves extra expenditure by way of making arrangement for lighting and special transport for working parties due to odd hour					
		In the light of above, the authorities engaged in preparing the cost estimates may exercise their judgment and cater for the additional cost to the extent of 2 to 3 per cent, keeping in view the severity of factors mentioned above. Supporting details for the extra cost based on the actual conditions in specific cases will have to give in justification.					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.36	Suggestive		Embankment Construction with Flyash/Pond ash available from coal or lignite burning Thermal Plants as waste material.					
			Construction of embankment with Flyash conforming to table 1 of IRC: SP: 58 - 2001 obtained from coal or lignite burning thermal power stations as waste material, spread and compacted in layer of 200mm thickness each at OMC, all as specified in IRC: SP: 58-2001 and as per approved plans.					
			Unit = cum					
			Taking output = 360 cum					
			a) Labour					
			Mate	day	0.160	582.53	93.20	L-12
			Mazdoor	day	4.000	529.57	2118.28	L-13
			b) Machinery					
			Hydraulic Excavator 0.9 cum bucket capacity @ 60 cum/hour	hour	6.000	1444.67	8668.00	P&M-026
			Tipper 10T capacity flyash 360 x 1.2 = 432 tonnes	tonne.km	432 x L	8.90	1030032.93	Lead =268 km & P&M-058
			Add 10 per cent of cost of carriage for loading and unloading				103003.29	
			Dozer 80 HP for spreading @ 200 cum/hour	hour	1.800	3056.68	5502.02	P&M-014
			Motor Grader for grading @ 100 cum/hour	hour	3.600	2324.81	8369.32	P&M-032
			Water tanker 6 KL capacity	hour	12.000	819.77	9837.29	P&M-060
			Vibratory Roller 8-10 tonne @ 100 cum/hour	hour	3.600	833.54	3000.75	P&M-059
			c) Overhead charges @ 10% on (a+b)				117062.51	
			d) Contractor's profit @ 16% on (a+b+c)				206030.02	
			Cost for 360 cum = a+b+c+d				1493717.62	
			Rate per cum = (a+b+c+d)/360				4149.22	
						say	4149.00	
		Note	1.As flyash is available free of cost as waste material from Thermal Plants, cost of material has not been added. 2.The earth cover on sides and intermediate layers of earth sandwiching the flyash have not been included in this analysis. The same are required to be provided as per approved design and priced separately as embankment construction.					
3.18	305		Construction of Subgrade and Earthen Shoulders with lime stabilization					
			Construction of subgrade after improving with lime as stabiliser with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet the requirement of Table 300-2.					
			Unit = cum					
			Taking output = 300 cum					
			a) Labour					
			Mate	day	0.360	582.53	209.71	L-12
			Skilled Mazdoor	day	1.000	582.53	582.53	
			Mazdoor	day	8.000	529.57	4236.56	L-13
			b) Machinery					
			Excavator 0.90 cum bucket capacity	hour	6.000	1444.67	8668.00	P&M-026
			Tipper 10 tonne capacity	tonne.km	175xL	8.90	15569.35	Lead =10 km & P&M-058
			Add 10 per cent of cost of carriage to cover cost of loading and unloading				1556.94	
			Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	3056.68	1528.34	P&M-014
			Motor grader for grading @ 50 cum per hour	hour	6.000	2324.81	13948.87	P&M-032
			Water tanker with 6 km lead	hour	12.000	819.77	9837.29	P&M-060
			Vibratory roller 8-10 tonnes @ 80 cum per hour	hour	3.900	833.54	3250.82	P&M-059
			c) Material					
			Cost of water	KL	72.000	529.57	38129.03	M-189
			Lime	tonne	15.750	13451.08	211854.44	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Compensation for earth taken from private land	cum	100.000	10.59	1059.14	M-092
		d) Overhead charges @ 10% on (a+b+c)				31043.10	
		e) Contractor's profit @ 16% on (a+b+c+d)				54635.86	
		Cost for 300 cum = a+b+c+d+e				396109.97	
		Rate per cum = (a+b+c+d+e)/300				1320.37	
					say	<u>1320.00</u>	

CHAPTER - 4								
SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.1	401		Granular Sub-Base with Close Graded Material (Table:- 400-1)					
		A	Plant Mix Method					
			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					
			Unit = cum					
			Taking output = 225 cum (450 tonne)					
			a) Labour					
			Mate	day	0.400	582.53	233.01	L-12
			Mazdoor skilled	day	2.000	688.44	1376.88	L-15
			Mazdoor	day	8.000	529.57	4236.56	L-13
			b) Machinery					
			Wet mix plant @ 75 tonne capacity per hour	hour	6.000	2018.51	12111.05	P&M-093
			Electric generator 125 KVA	hour	6.000	709.62	4257.74	P&M-018
			Water tanker 6 KL capacity 5 km lead with one trip per hour	hour	4.500	819.77	3688.98	P&M-060
			Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
			Tipper 10 tonne	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
			Add 10 per cent of cost of carriage to cover loading and unloading				4003.55	
			Motor Grader 110 HP	hour	6.000	2324.81	13948.87	P&M-032
			Vibratory roller 8-10 t	hour	6.000	833.54	5001.26	P&M-059
			c) Material					
			Close graded Granular sub-base Material as per table 400-1					
			For Grading-I Material					
			53 mm to 9.5 mm @ 50 per cent	cum	144.000	1928.16	277655.61	M-013
			9.5 mm to 2.36 mm @ 20 per cent	cum	57.000	2028.36	115616.44	M-017
			2.36 mm below @ 30 per cent	cum	86.400	2040.01	176256.79	M-020
			Cost of water	KL	27.000	529.57	14298.39	M-189
			OR					
			For Grading-II Material					
			26.5 mm to 9.5 mm @ 35 per cent	cum	100.800	1993.41	200935.42	M-015
			9.5 mm to 2.36 mm @ 25 per cent	cum	72.000	2028.36	146041.82	M-017
			2.36 mm below @ 40 per cent	cum	115.200	2040.01	235009.05	M-020
			Cost of water	KL	27.000	529.57	14298.39	M-189
			OR					
			For Grading-III Material					
			9.5 mm to 4.75 mm @ 35 per cent	cum	100.800	2022.53	203871.36	M-016
			4.75 mm to 2.36 mm @ 12.5 per cent	cum	36.000	2034.18	73230.62	M-018
			2.36 mm below @ 52.5 per cent	cum	151.200	2040.01	308449.38	M-020
			Cost of water	KL	27.000	529.57	14298.39	M-189
4.1A		(i)	Rate per cum for grading-I Material					
			d) Overhead charges @ 10% on (a+b+c)				67830.65	
			e) Contractor's profit @ 16% on (a+b+c+d)				119381.95	
			Cost for 225 cum = a+b+c+d+e				865519.12	
			Rate per cum = (a+b+c+d+e)/225				3846.75	
						say	3847.00	
4.1A		(ii)	Rate per cum for grading-II Material					
			d) Overhead charges @ 10% on (a+b+c)				69076.40	
			e) Contractor's profit @ 16% on (a+b+c+d)				121574.46	
			Cost for 225 cum = a+b+c+d+e				881414.84	
			Rate per cum = (a+b+c+d+e)/225				3917.40	
						say	3917.00	
4.1A		(iii)	Rate per cum for grading-III Material					
			d) Overhead charges @ 10% on (a+b+c)				69432.90	
			e) Contractor's profit @ 16% on (a+b+c+d)				122201.91	
			Cost for 225 cum = a+b+c+d+e				885963.86	
			Rate per cum = (a+b+c+d+e)/225				3937.62	
						say	3938.00	
		Note	Any one of the grading for material may be adopted as per design					
4.1		B	By Mix in Place Method					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density. complete as per clause 401					
		Unit = cum					
		Taking output = 300 cum					
		a) Labour					
		Mate	day	0.480	582.53	279.61	L-12
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		Mazdoor unskilled	day	10.000	529.57	5295.70	L-13
		b) Machinery					
		Motor Grader 110 HP @ 50 cum	hour	6.000	2324.81	13948.87	P&M-032
		Vibratory roller 8 -10 tonne	hour	6.000	833.54	5001.26	P&M-059
		Tractor - Rotavator	hour	12.000	385.53	4626.32	P&M-054
		Water tanker 6 KL capacity	hour	3.000	819.77	2459.32	P&M-060
		c) Material					
		Close graded Granular sub-base Material as per table 400-1					
		For Grading-I Material					
		53 mm to 9.5 mm @ 50 per cent	cum	192.000	1752.88	336552.26	M-013
		9.5 mm to 2.36 mm @ 20 per cent	cum	76.000	1843.96	140141.14	M-017
		2.36 mm below @ 30 per cent	cum	115.200	1854.55	213644.59	M-020
		Cost of water	KL	18.000	529.57	9532.26	M-189
		OR					
		For Grading-II Material					
		26.5 mm to 9.5 mm @ 35 per cent	cum	134.400	1812.19	243558.09	M-015
		9.5 mm to 2.36 mm @ 25 per cent	cum	96.000	1843.96	177020.39	M-017
		2.36 mm below @ 40 per cent	cum	153.600	1854.55	284859.46	M-020
		Cost of water	KL	18.000	529.57	9532.26	M-189
		OR					
		For Grading-III Material					
		9.5 mm to 4.75 mm @ 35 per cent	cum	134.400	1838.67	247116.80	M-016
		4.75 mm to 2.36 mm @ 12.5 per cent	cum	48.000	1849.26	88764.39	M-018
		2.36 mm below @ 52.5 per cent	cum	201.600	1854.55	373878.04	M-020
		Cost of water	KL	18.000	529.57	9532.26	M-189
4.1B	(i)	Rate per cum for grading-I Material					
		d) Overhead charges @ 10% on (a+b+c)				73285.82	
		e) Contractor's profit @ 16% on (a+b+c+d)				128983.05	
		Cost for 300 cum = a+b+c+d+e				935127.09	
		Rate per cum = (a+b+c+d+e)/300				3117.09	
					say	3117.00	
4.1B	(ii)	Rate per cum for grading-II Material					
		d) Overhead charges @ 10% on (a+b+c)				74795.82	
		e) Contractor's profit @ 16% on (a+b+c+d)				131640.64	
		Cost for 300 cum = a+b+c+d+e				954394.61	
		Rate per cum = (a+b+c+d+e)/300				3181.32	
					say	3181.00	
4.1B	(iii)	Rate per cum for grading-III Material					
		d) Overhead charges @ 10% on (a+b+c)				75227.95	
		e) Contractor's profit @ 16% on (a+b+c+d)				132401.18	
		Cost for 300 cum = a+b+c+d+e				959908.58	
		Rate per cum = (a+b+c+d+e)/300				3199.70	
					say	3200.00	
	Note	Any one of the grading for material may be adopted as per design					
4.2	401	Granular Sub-Base with Coarse Graded Material (Table:- 400- 2)					
		Construction of granular sub-base by providing coarse graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density. complete as per clause 401.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Unit = cum					
		Taking output = 300 cum					
		a) Labour					
		Mate	day	0.400	582.53	233.01	L-12
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		Mazdoor	day	8.000	529.57	4236.56	L-13
		b) Machinery					
		Mortar Grader 110 HP @ 50 cum per hour	hour	6.000	2324.81	13948.87	P&M-032
		Vibratory roller 8 -10 tonne	hour	6.000	833.54	5001.26	P&M-059
		Water tanker 6 KL capacity	hour	3.000	819.77	2459.32	P&M-060
		c) Material					
		For coarse graded Granular sub-base Materials per table 400-2					
		For grading-I Material					
		53 mm to 26.5 mm @ 35 per cent	cum	134.400	1890.88	254134.58	M-029
		26.5 mm to 4.75 mm @ 45 per cent	cum	172.800	1984.09	342850.16	M-026
		2.36 mm below @ 20 per cent (Coarse Sand)	cum	76.800	2042.34	156851.65	M-022
		Cost of water	KL	18.000	529.57	9532.26	M-189
		OR					
		For Grading-II Material					
		26.5 mm to 4.75 mm @ 75 per cent	cum	288.000	1984.09	571416.93	M-026
		2.36 mm below @ 25 per cent	cum	96.000	2042.34	196064.57	M-022
		Cost of water	KL	18.000	529.57	9532.26	M-189
		OR					
		For Grading-III Material					
		9.5 mm to 4.75 mm @ 66 per cent	cum	255.000	2013.21	513369.29	M-025
		2.36 mm below @ 34 per cent	cum	129.000	2042.34	263461.76	M-022
		Cost of water	KL	18.000	529.57	9532.26	M-189
4.2	(i)	Rate per cum for grading-I Material					
		d) Overhead charges @ 10% on (a+b+c)				79062.45	
		e) Contractor's profit @ 16% on (a+b+c+d)				139149.92	
		Cost for 300 cum = a+b+c+d+e				1008836.92	
		Rate per cum = (a+b+c+d+e)/300				3362.79	
					say	<u>3363.00</u>	
4.2	(ii)	Rate per cum for grading-II Material					
		d) Overhead charges @ 10% on (a+b+c)				80426.97	
		e) Contractor's profit @ 16% on (a+b+c+d)				141551.46	
		Cost for 300 cum = a+b+c+d+e				1026248.08	
		Rate per cum = (a+b+c+d+e)/300				3420.83	
					say	<u>3421.00</u>	
4.2	(iii)	Rate per cum for grading-III Material					
		d) Overhead charges @ 10% on (a+b+c)				81361.92	
		e) Contractor's profit @ 16% on (a+b+c+d)				143196.98	
		Cost for 300 cum = a+b+c+d+e				1038178.12	
		Rate per cum = (a+b+c+d+e)/300				3460.59	
					say	<u>3461.00</u>	
	Note	Any one of the grading for material may be adopted as per design					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.3	402		Lime Stabilisation for Improving Sub-grade					
			Laying and spreading available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with rotavator with 3 per cent slaked lime having minimum content of 70 per cent of CaO, grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade					
			Unit = cum					
			Taking output = 300 cum (525 tonne)					
		A	By Mechanical Means					
			a) Labour					
			Mate	day	0.360	582.53	209.71	L-12
			Skilled mazdoor for alignment and geometrics	day	1.000	688.44	688.44	L-15
			Mazdoor for spraying lime	day	8.000	529.57	4236.56	L-13
			b) Machinery					
			Tractor with ripper and rotavator attachments @ 60 cum per hour for ripping and 25 cum per hour for mixing	hour	12.000	396.12	4753.42	P&M-055
			Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2324.81	13948.87	P&M-032
			Vibratory roller 8 - 10 tonne capacity	hour	6.00x0.65*	833.54	3250.82	P&M-059
			Water tanker 6 KL capacity	hour	12.000	819.77	9837.29	P&M-060
			c) Material					
			Lime at site	tonne	15.750	13451.08	211854.44	M-188
			Cost of water	KL	72.000	529.57	38129.03	M-189
			d) Overhead charges @ 10% on (a+b+c)				28690.86	
			e) Contractor's profit @ 16% on (a+b+c+d)				50495.91	
			Cost for 300 cum= a+b+c+d+e				366095.34	
			Rate per cum =(a+b+c+d+e)/300				1220.32	
						say	<u>1220.00</u>	
		Note	* Though vibratory roller is required only for 3 hours as per norms, but the same has to be available at site for 6 hours as other machines for spreading and mixing will take 6 hours. The usage rates of roller have been multiplied with a factor of 0.65.					
4.3		B	By Manual Means					
			Unit = cum					
			Taking output = 150 cum (263 tonnes)					
			a) Labour					
			Mate	day	1.440	582.53	838.84	L-12
			Mazdoor skilled	day	1.000	688.44	688.44	L-15
			Mazdoor	day	35.000	529.57	18534.95	L-13
			b) Machinery					
			Vibratory roller 8 - 10 tonne @ 60 cum per hour	hour	2.500	833.54	2083.86	P&M-059
			Water tanker 6 KL capacity	hour	6.000	819.77	4918.65	P&M-060
			c) Material					
			Lime at site	tonne	8.000	13451.08	107608.60	M-188
			Cost of water	KL	36.000	529.57	19064.52	M-189
			d) Overhead charges @ 10% on (a+b+c)				15373.78	
			e) Contractor's profit @ 16% on (a+b+c+d)				27057.86	
			Cost for 150 cum= a+b+c+d+e				196169.49	
			Rate per cum =(a+b+c+d+e)/150				1307.80	
						say	<u>1308.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.4	402	Lime Treated Soil for Sub- Base					
		Providing, laying and spreading soil on a prepared sub grade, pulverising, mixing the spread soil in place with rotavator with 3 per cent slaked lime with minimum content of 70 per cent of CaO, grading with motor grader and compacting with the road roller at OMC to achieve at least 98 per cent of the max dry density to form a layer of sub base.					
		Unit = cum					
		Taking output = 300 cum (525 tonnes)					
		a) Labour					
		Mate	day	0.480	582.53	279.61	L-12
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		Mazdoor	day	10.000	529.57	5295.70	L-13
		b) Machinery					
		Excavator 0.90 cum bucket capacity	hour	6.000	1444.67	8668.00	P&M-026
		Tipper for carriage of soil	tonne.km	525 x L	8.90	46708.06	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4670.81	
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2324.81	13948.87	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	833.54	5001.26	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	385.53	4626.32	P&M-054
		Water tanker 6 KL capacity	hour	12.000	819.77	9837.29	P&M-060
		c) Material					
		Lime at site	tonne	15.750	13451.08	211854.44	M-188
		Cost of water	KL	72.000	529.57	38129.03	M-189
		d) Overhead charges @ 10% on (a+b+c)				35039.63	
		e) Contractor's profit @ 16% on (a+b+c+d)				61669.74	
		Cost for 300 cum = a+b+c+d+e				447105.65	
		Rate per cum= (a+b+c+d+e)/300				1490.35	
					say	1490.00	
4.5	403	Cement Treated Soil Sub Base/ Base					
		Providing, laying and spreading soil on a prepared sub grade, pulverising, adding the designed quantity of cement to the spread soil, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.					
		Unit = cum					
		Taking output = 300 cum (525 tonnes)					
		For 4 per cent quantity of cement by weight of soil					
		a) Labour					
		Mate	day	0.480	582.53	279.61	L-12
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		Mazdoor	day	10.000	529.57	5295.70	L-13
		b) Machinery					
		Excavator 0.90 cum bucket capacity	hour	6.000	1444.67	8668.00	P&M-026
		Tipper for carriage of soil	tonne.km	525 x L	8.90	46708.06	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4670.81	
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2324.81	13948.87	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	833.54	5001.26	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	385.53	4626.32	P&M-054
		Water tanker 6 KL capacity	hour	12.000	819.77	9837.29	P&M-060

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Material					
		Cement at site (@ 4 per cent of 525 tonne)	tonne	21.000	7169.28	150554.88	M-081
		Cost of water	KL	72.000	529.57	38129.03	M-189
		d) Overhead charges @ 10% on (a+b+c)				28909.67	
		e) Contractor's profit @ 16% on (a+b+c+d)				50881.02	
		Cost for 300 cum = a+b+c+d+e				368887.41	
		Rate per cum = (a+b+c+d+e)/300				1229.62	
					say	1230.00	
4.6	403	Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4 in Sub base/ Base					
		Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.					
		Unit = cum					
		Taking output = 300 cum (600 tonnes)					
		Quantity of cement assumed as 4 per cent of quantity of crushed rock by weight.					
		a) Labour					
		Mate	day	0.480	582.53	279.61	L-12
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		Mazdoor	day	10.000	529.57	5295.70	L-13
		b) Machinery					
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2324.81	13948.87	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	833.54	5001.26	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	385.53	4626.32	P&M-054
		Water tanker 6 KL capacity	hour	10.000	819.77	8197.74	P&M-060
		c) Material					
		Cement at site @ 4 per cent by weight of crushed aggregate (600 tonne)	tonne	24.000	7169.28	172062.72	M-081
		Grading of material for sub-base course					
		37.5 mm to 9.5 mm @ 55 per cent	cum	211.200	1774.06	374681.29	M-014
		9.5 mm to 4.75 mm @ 20 per cent	cum	76.800	1830.19	140558.86	M-025
		4.75 mm to 75 micron @ 25 per cent	cum	96.000	1852.44	177833.81	M-019
		Cost of water	KL	60.000	529.57	31774.19	M-189
		or					
		Grading of material for Base course					
		37.5 mm to 9.5 mm @ 32.5 per cent	cum	124.800	1771.94	221138.22	M-028
		9.5 mm to 4.75 mm @ 5 per cent	cum	19.200	1830.19	35139.72	M-025
		4.75 mm to 75 micron @ 62.5 per cent	cum	240.000	1851.38	444330.32	M-023
		Cost of water	KL	60.000	529.57	31774.19	M-189
4.6		(i) For Sub-Base course					
		d) Overhead charges @ 10% on (a+b+c)				93563.73	
		e) Contractor's profit @ 16% on (a+b+c+d)				164672.16	
		Cost for 300 cum = a+b+c+d+e				1193873.15	
		Rate per cum = (a+b+c+d+e)/300				3979.58	
					say	3980.00	
4.6		(ii) For Base course					
		d) Overhead charges @ 10% on (a+b+c)				94317.16	
		e) Contractor's profit @ 16% on (a+b+c+d)				165998.19	
		Cost for 300 cum = a+b+c+d+e				1203486.91	
		Rate per cum = (a+b+c+d+e)/300				4011.62	
					say	4012.00	
		Note Quantities of aggregates provided under 'c' above are uncompacted quantities.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.7	404.3.1	Making 50 mm x 50 mm Furrows					
		Making 50 mm x 50 mm furrows, 25mm/ 50mm deep, 450 to the center line of the road and at one metre interval in the existing thin bituminous wearing coarse including sweeping and disposal of excavated material within 1000 metres lead					
		Unit = sqm					
		Taking output = 30 m x 7 m = 210 sqm					
	(i)	25mm deep furrow cutting					
		a) Labour					
		Mate	day	0.080	582.53	46.60	L-12
		Mazdoor	day	2.000	529.57	1059.14	L-13
		b) Machinery					
		Tractor-trolley	hour	0.200	357.99	71.60	P&M-053
		c) Overhead charges @ 10% on (a+b)				117.73	
		d) Contractor's profit @ 16% on (a+b+c)				207.21	
		Cost for 210 sqm = a+b+c+d				1502.29	
		Rate per sqm = (a+b+c+d)/210				7.15	
					say	7.20	
	(ii)	50mm deep furrow cutting					
		a) Labour					
		Mate	day	0.160	582.53	93.20	L-12
		Mazdoor	day	4.000	529.57	2118.28	L-13
		b) Machinery					
		Tractor-trolley	hour	0.400	357.99	143.20	P&M-053
		c) Overhead charges @ 10% on (a+b)				235.47	
		d) Contractor's profit @ 16% on (a+b+c)				414.42	
		Cost for 210 sqm = a+b+c+d				3004.57	
		Rate per sqm = (a+b+c+d)/210				2994.57	
					say	2995.00	
4.8	404.3.2	Inverted Choke					
		Construction of inverted choke by providing, laying, spreading and compacting screening B type/ coarse sand of specified grade in uniform layer on a prepared surface with motor grader and compacting with power roller etc					
		Unit = cum					
		Taking output = 600 cum					
		a) Labour					
		Mate	day	0.920	582.53	535.92	L-12
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		Mazdoor	day	21.000	529.57	11120.97	L-13
		b) Machinery					
		Motor Grader 110 HP	hour	6.000	2324.81	13948.87	P&M-032
		Vibratory roller 8-10 tonnes @ 60 cum per hour	hour	6.000	833.54	5001.26	P&M-059
		Water tanker 6 KL capacity	hour	18.000	819.77	14755.94	P&M-060
		c) Material					
		Screening type 'B' or coarse sand	cum	720.000	6977.61	5023881.29	M-004
		Cost of water	KL	108.000	529.57	57193.55	M-189
		d) Overhead charges @ 10% on (a+b+c)				512781.47	
		e) Contractor's profit @ 16% on (a+b+c+d)				902495.38	
		Cost for 600 cum = a+b+c+d+e				6543091.53	
		Rate per cum = (a+b+c+d+e)/600				10905.15	
					say	10905.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.9	404		Water Bound Macadam					
			Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with 3 wheeled steel/ vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density					
		A	By Manual Means					
			Unit = cum					
			Taking output = 360 cum					
			a) Labour					
			Mate	day	10.080	582.53	5871.87	L-12
			Mazdoor skilled	day	2.000	688.44	1376.88	L-15
			Mazdoor	day	250.000	529.57	132392.47	L-13
			b) Machinery					
			Vibratory roller 8 - 10 tonne @ 60cum per hour	hour	6.000	833.54	5001.26	P&M-059
			or					
			Smooth 3 wheeled steel roller @ 30cum/hour	hour	12.000			
			Water tanker 6 KL capacity	hour	24.000	819.77	19674.58	P&M-060
			c) Material (Refer table 400 - 7, 8 & 9)					
4.9A		(i)	Grading-I					
			Aggregate					
			Grading-I 90 mm to 45 mm @ 1.21cum per 10 sqm for compacted thickness of 100 mm	cum	435.600	1850.32	805998.17	M-039
			Stone Screening					
			Type A 13.2 mm for grading-I @ 0.27 cum per 10 sqm	cum	97.200	2145.82	208573.43	M-052
			OR					
			Crushable type such as Moorum or Gravel for grading-I @ 0.30 cum per 10 sqm	cum	108.000	1378.81	148911.41	M-007
			Binding material					
			Binding Material @ 0.08cum per 10 sqm for grading I material	cum	28.800	1378.81	39709.71	M-007
			Cost of water	KL	144.000	529.57	76258.06	M-189
4.9A (i)		(a)	Using Scrining Crushable type such as Moorum or Gravel					
			d) Overhead charges @ 10% on (a+b+c)				119548.47	
			e) Contractor's profit @ 16% on (a+b+c+d)				210405.31	
			Cost for 360 cum = a+b+c+d+e				1525438.49	
			Rate per cum = (a+b+c+d+e)/360				4237.33	
						say	4237.00	
			OR					
4.9A (i)		(b)	Using Scrining Type-A (13.2mm agg.)					
			d) Overhead charges @ 10% on (a+b+c)				129485.64	
			e) Contractor's profit @ 16% on (a+b+c+d)				227894.73	
			Cost for 360 cum = a+b+c+d+e				1652236.82	
			Rate per cum = (a+b+c+d+e)/360				4589.55	
						say	4590.00	
4.9A		(ii)	Grading-II					
			Aggregate					
			Grading-II 63 mm to 45 mm /Grading-III 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	1882.09	819839.01	M-038
			Stone Screening					
			Type A 13.2 mm for grading-II @ 0.12 cum per 10 sqm	cum	57.600	2145.82	123599.07	M-052
			OR					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	1378.81	145588.48	M-007
			OR					
			Type B11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	2156.41	186313.70	M-051
			Binding material					
			Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	1378.81	39709.71	M-007
			Cost of water	KL	144.000	529.57	76258.06	M-189
4.9A (ii)		(a)	Using Scrining Crushable type such as Moorum or Gravel					
			d) Overhead charges @ 10% on (a+b+c)				120600.26	
			e) Contractor's profit @ 16% on (a+b+c+d)				212256.46	
			Cost for 360 cum = a+b+c+d+e				1538859.35	
			Rate per cum = (a+b+c+d+e)/360				4274.61	
						say	4275.00	
			OR					
4.9A (ii)		(b)	Using Scrining Type-A (13.2mm agg.)					
			d) Overhead charges @ 10% on (a+b+c)				122372.29	
			e) Contractor's profit @ 16% on (a+b+c+d)				215375.23	
			Cost for 360 cum = a+b+c+d+e				1561470.45	
			Rate per cum = (a+b+c+d+e)/360				4337.42	
						say	4337.00	
4.9A (ii)		(c)	Using Scrining Type-B (11.2mm agg.)					
			d) Overhead charges @ 10% on (a+b+c)				128643.76	
			e) Contractor's profit @ 16% on (a+b+c+d)				226413.01	
			Cost for 360 cum = a+b+c+d+e				1641494.32	
			Rate per cum = (a+b+c+d+e)/360				4559.71	
						say	4560.00	
4.9A		(iii)	Grading-III Aggregate					
			Grading-III 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	1940.34	845213.88	M-036
			Stone Screening					
			Type B 11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	2156.41	186313.70	M-051
			OR					
			Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	1378.81	145588.48	M-007
			Binding material					
			Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	1378.81	39709.71	M-007
			Cost of water	KL	144.000	529.57	76258.06	M-189
4.9A (iii)		(a)	Using Scrining Crushable type such as Moorum or Gravel					
			d) Overhead charges @ 10% on (a+b+c)				123137.75	
			e) Contractor's profit @ 16% on (a+b+c+d)				216722.44	
			Cost for 360 cum = a+b+c+d+e				1571237.68	
			Rate per cum = (a+b+c+d+e)/360				4364.55	
						say	4365.00	
			OR					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.9A (iii)		(b)	Using Scrining Type-B (11.2mm agg.)					
			d) Overhead charges @ 10% on (a+b+c)				131181.24	
			e) Contractor's profit @ 16% on (a+b+c+d)				230878.99	
			Cost for 360 cum = a+b+c+d+e				1673872.65	
			Rate per cum = (a+b+c+d+e)/360				4649.65	
						say	4650.00	
			(Anyone of the aggregate grading, screening and binding material may be used as per design)					
4.9		B	By Mechanical Means:					
			Unit = cum					
			Taking output = 360 cum					
			a) Labour					
			Mate	day	0.680	582.53	396.12	L-12
			Mazdoor skilled	day	2.000	688.44	1376.88	L-15
			Mazdoor	day	15.000	529.57	7943.55	L-13
			b) Machinery					
			Motor grader 110 HP @ 50cum/hr. for spreading	hour	7.200	2324.81	16738.65	P&M-032
			Vibratory roller 8-10 tonnes @ 60cum/hr.	hour	6.000	833.54	5001.26	P&M-059
			or					
			Smooth 3 wheeled steel roller @ 30cum/hr.	hour	12.000			
			Water tanker 6 KL capacity	hour	24.000	819.77	19674.58	P&M-060
			c) Material (Refer table 400 - 7, 8 & 9)					
4.9B		(i)	Grading-I					
			Aggregate					
			Grading-I 90 mm to 45 mm@ 1.21cum per 10 sqm for compacted thickness of 100 mm	cum	435.600	1850.32	805998.17	M-039
			Stone Screening					
			Type A 13.2 mm for grading-I @ 0.27 cum per 10 sqm	cum	97.200	2145.82	208573.43	M-052
			OR					
			Crushable type such as Moorum or Gravel for grading-I @ 0.30 cum per 10 sqm	cum	108.000	1378.81	148911.41	M-007
			Binding material					
			Binding Material @ 0.08cum per 10 sqm for grading I material	cum	28.800	1378.81	39709.71	M-007
			Cost of water	KL	144.000	529.57	76258.06	M-189
4.9B (i)		(a)	Using Scrining Crushable type such as Moorum or Gravel					
			d) Overhead charges @ 10% on (a+b+c)				108229.87	
			e) Contractor's profit @ 16% on (a+b+c+d)				190484.57	
			Cost for 360 cum = a+b+c+d+e				1381013.12	
			Rate per cum = (a+b+c+d+e)/360				3836.15	
						say	3836.00	
			OR					
4.9B (i)		(b)	Using Scrining Type-A (13.2mm agg.)					
			d) Overhead charges @ 10% on (a+b+c)				118167.04	
			e) Contractor's profit @ 16% on (a+b+c+d)				207973.99	
			Cost for 360 cum = a+b+c+d+e				1507811.45	
			Rate per cum = (a+b+c+d+e)/360				4188.37	
						say	4188.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.9B		(ii)	Grading-II					
			Aggregate					
			Grading-II 63 mm to 45 mm /Grading-III 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	1882.09	819839.01	M-038
			Stone Screening					
			Type A 13.2 mm for grading-II @ 0.12 cum per 10 sqm	cum	57.600	2145.82	123599.07	M-052
			OR					
			Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	1378.81	145588.48	M-007
			OR					
			Type B 11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	2156.41	186313.70	M-051
			Binding material					
			Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	1378.81	39709.71	M-007
			Cost of water	KL	144.000	529.57	76258.06	M-189
4.9B (ii)		(a)	Using Scrining Crushable type such as Moorum or Gravel					
			d) Overhead charges @ 10% on (a+b+c)				109281.66	
			e) Contractor's profit @ 16% on (a+b+c+d)				192335.72	
			Cost for 360 cum = a+b+c+d+e				1394433.97	
			Rate per cum = (a+b+c+d+e)/360				3873.43	
						say	3873.00	
			OR					
4.9B (ii)		(b)	Using Scrining Type-A (13.2mm agg.)					
			d) Overhead charges @ 10% on (a+b+c)				111053.69	
			e) Contractor's profit @ 16% on (a+b+c+d)				195454.49	
			Cost for 360 cum = a+b+c+d+e				1417045.07	
			Rate per cum = (a+b+c+d+e)/360				3936.24	
						say	3936.00	
4.9B (ii)		(c)	Using Scrining Type-B (11.2mm agg.)					
			d) Overhead charges @ 10% on (a+b+c)				117325.15	
			e) Contractor's profit @ 16% on (a+b+c+d)				206492.27	
			Cost for 360 cum = a+b+c+d+e				1497068.94	
			Rate per cum = (a+b+c+d+e)/360				4158.52	
						say	4159.00	
4.9B		(iii)	Grading-III					
			Aggregate					
			Grading-III 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	1940.34	845213.88	M-036
			Stone Screening					
			Type B 11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	2156.41	186313.70	M-051
			OR					
			Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	1378.81	145588.48	M-007
			Binding material					
			Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	1378.81	39709.71	M-007
			Cost of water	KL	144.000	529.57	76258.06	M-189

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.9B (iii)		(a)	Using Scrining Crushable type such as Moorum or Gravel					
			d) Overhead charges @ 10% on (a+b+c)				111819.15	
			e) Contractor's profit @ 16% on (a+b+c+d)				196801.70	
			Cost for 360 cum = a+b+c+d+e				1426812.30	
			Rate per cum = (a+b+c+d+e)/360				3963.37	
						say	<u>3963.00</u>	
			OR					
4.9B (iii)		(b)	Using Scrining Type-B (11.2mm agg.)					
			d) Overhead charges @ 10% on (a+b+c)				119862.64	
			e) Contractor's profit @ 16% on (a+b+c+d)				210958.25	
			Cost for 360 cum = a+b+c+d+e				1529447.28	
			Rate per cum = (a+b+c+d+e)/360				4248.46	
						say	<u>4248.00</u>	
		Note	As three wheeled smooth rollers are also very commonly used, the same has been provided as an alternative.					
4.10	405		Crushed Cement Concrete Sub-base / Base					
			Breaking and crushing of material obtained by breaking damaged cement concrete slabs to size range not exceeding 75 mm as specified in table 400.7 transporting the aggregates obtained from breaking of cement concrete slabs at a lead of L km., laying and compacting the same as sub base/ base course, constructed as WBM to clause 404 except the use of screening or binding Material					
			Unit = cum					
			Taking output = 360 cum					
			a) Labour					
			Mate	day	4.160	582.53	2423.31	L-12
			Mazdoor skilled	day	2.000	688.44	1376.88	L-15
			Mazdoor for crushing broken cement concrete pavement/slabs into aggregate	day	102.000	529.57	54016.13	L-13
			b) Machinery					
			Motor Grader, 110 HP @ 50 cum/hr.	hour	6.000	2324.81	13948.87	P&M-032
			Vibratory roller 8 - 10 tonne @ 60 cum per hour	hour	6.000	833.54	5001.26	P&M-059
			or					
			Smooth 3 wheeled steel roller @ 30cum/hr.	hour	12.000			
			Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
			Tipper 10 tonne capacity	tonne.km	720 x L	8.90	64056.77	Lead = 10 km & P&M-058
			Add 10 per cent of cost of carriage to cover cost of loading and unloading				6405.68	
			Water tanker 6 KL capacity with 5 km lead @ 1 trip per hour	hour	12.000	819.77	9837.29	P&M-060
			c) Material					
			Material available from dismantled concrete slab after crushing / breaking and only carriage is required to be provided					
			Cost of water	KL	72.000	529.57	38129.03	M-189
			d) Overhead charges @ 10% on (a+b+c)				20078.11	
			e) Contractor's profit @ 16% on (a+b+c+d)				35337.48	
			Cost for 360 cum = a+b+c+d+e				256196.72	
			Rate per cum = (a+b+c+d+e)/360				711.66	
						say	<u>712.00</u>	
		Note	1. It is assumed that dismantling of concrete slab/pavement has been considered separately. Hence same is not added in this analysis. Only labour for crushing the dismantled slab into aggregate has been added. Carriage from stock pile to work site has been provided with a lead of L km.					
			2. In case of breaking of slabs is done locally without involvement of transportation, the provision of tipper, front end loader and loading/unloading charges may be deleted.					
			3. As three wheeled smooth steel rollers are commonly in use, the same has been provided as an alternative.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.11	405.2	Penetration Coat Over Top Layer of Crushed Cement Concrete Base					
		Spraying of bitumen over cleaned dry surface of crushed cement concrete base at the rate of 25 kg per 10 sqm by a bitumen pressure distributor, spreading of key aggregates at the rate of 0.13 cum per 10 sqm by a mechanical gritter and rolling the surface as per clause 506.3.8					
		Unit = sqm					
		Taking output = 7500 sqm					
		a) Labour					
		Mate	day	0.560	582.53	326.22	L-12
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		Mazdoor	day	12.000	529.57	6354.84	L-13
		b) Machinery					
		Mechanical broom hydraulic @ 1250 sqm per hour	hour	6.000	540.16	3240.97	P&M-031
		Hydraulic self propelled chips spreader	hour	6.000	2557.82	15346.94	P&M-025
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 10 tonne capacity	hour	6.000	1006.18	6037.10	P&M-048
		Vibratory roller 8 -10 tonnes @ 30 cum per hour	hour	6.00x0.65*	833.54	3250.82	P&M-059
		Bitumen pressure distributor @ 1750 sqm per hour	hour	4.280	1041.13	4456.06	P&M-004
		c) Material					
		Crushed stone aggregate 11.2 mm size	cum	97.500	2372.05	231274.82	M-051
		Bitumen (60-70 grade)	tonne	0.250	41363.28	10340.82	M-074
		d) Overhead charges @ 10% on (a+b+c)				28759.14	
		e) Contractor's profit @ 16% on (a+b+c+d)				50616.08	
		Cost for 7500 sqm = a+b+c+d+e				366966.57	
		Rate per sqm = (a+b+c+d+e)/7500				48.93	
					say	49.00	
		Note Though vibratory roller is required only for 3 hours as per norms, the same is required to be available at site for 6 hours to match with other machines. The usage rates of vibratory roller may be multiplied with a factor of 0.65.					
4.12	406	Wet Mix Macadam					
		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					
		Unit = cum					
		Taking output = 225 cum (495 tonnes)					
		a) Labour					
		Mate	day	0.480	582.53	279.61	L-12
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		Mazdoor	day	10.000	529.57	5295.70	L-13
		b) Machinery					
		Wet mix plant of 75 tonne hourly capacity	hour	9.000	1397.53	12577.81	P&M-094
		Electric generator 125 KVA	hour	6.000	709.62	4257.74	P&M-018
		Front end loader 1 cum capacity	hour	6.000	930.98	5585.90	P&M-017
		Paver finisher	hour	6.000	1261.44	7568.61	P&M-035
		Vibratory roller 8 - 10 tonne	hour	6x0.65	833.54	3250.82	P&M-059
		or					
		Smooth 3 wheeled steel roller @ 8-10 tonnes.	hour	12.000			
		Water tanker 6 KL capacity	hour	3.000	819.77	2459.32	P&M-060
		Tipper	tonne.km	495 x L	8.90	44039.03	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4403.90	
		c) Material (Table 400-11)					
		45 mm to 22.4 mm @ 30 per cent	cum	89.100	2111.08	188097.00	M-034
		22.4 mm to 2.36 mm @ 40 per cent	cum	118.800	2612.05	310311.60	M-031

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			2.36 mm to 75 micron @ 30 per cent	cum	89.100	2042.34	181972.43	M-022
			Cost of water	KL	18.000	529.57	9532.26	M-189
			d) Overhead charges @ 10% on (a+b+c)				78100.86	
			e) Contractor's profit @ 16% on (a+b+c+d)				137457.52	
			Cost for 225 cum = a+b+c+d+e				996567.01	
			Rate per cum = (a+b+c+d+e)/225				4429.19	
						say	<u>4429.00</u>	
		Note	1. Though vibratory roller is required only for 3 hours as per norms, the same is required to be available at site for 6 hours to match with other machines. The usage rates of vibratory roller may be multiplied with a factor of 0.65					
			2. As three wheeled smooth steel rollers are commonly in use, the same has been provided as an alternative which can be used if the thickness of individual layer does not exceed 100 mm..					
4.13	407		Construction of Median and Island with Soil Taken from Roadway Cutting					
			Construction of Median and Island above road level 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					
			Unit = cum					
			Taking output = 21 cum					
			a) Labour					
			Mate	day	0.240	582.53	139.81	L-12
			Mazdoor	day	6.000	529.57	3177.42	L-13
			b) Machinery					
			Water tanker 6 KL with 5 km lead and 1 trip per hour	hour	1.000	819.77	819.77	P&M-060
			Plate compactor @ 3.5 cum per hour	hour	6.000	187.94	1127.67	P&M-086
			c) Material					
			Cost of water	KL	6.000	529.57	3177.42	M-189
			d) Overhead charges @ 10% on (a+b+c)				844.21	
			e) Contractor's profit @ 16% on (a+b+c+d)				1485.81	
			Cost for 21 cum = a+b+c+d+e				10772.10	
			Rate per cum = (a+b+c+d+e)/21				512.96	
						say	<u>513.00</u>	
		Note	This analysis provides for median and island with earthen top. In case the surface is required to be turfed or planted with shrubs, the same is required to be provided separately as per analysis given in the chapter on horticulture. In case granular fill is required to be paved, quantities of paving are required to be calculated as per approved design and paid separately.					
4.14	407		Construction of Median and Island with Soil Taken from Borrow Areas					
			Construction of median and Island above road level with approved material brought from borrow pits, spread, sloped and compacted as per clause 407					
			Unit = cum					
			Taking output = 21 cum					
			a) Labour					
			Mate	day	0.160	582.53	93.20	L-12
			Mazdoor	day	4.000	529.57	2118.28	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Machinery					
		Water tanker with 5 km lead	hour	1.000	819.77	819.77	P&M-060
		Plate Compactor @ 3.5 cum per hour	hour	6.000	187.94	1127.67	P&M-086
		Hydraulic Excavator 1.0 cum bucket capacity @60 cum per hour	hour	0.500	1444.67	722.33	P&M-026
		Tipper 10 tonne capacity	tonne.km	52.5 x L	8.90	4670.81	Lead =10 km & P&M-058
		Add 10 per cent of cost of transportation to cover cost of loading and unloading				467.08	
		c) Material					
		Cost of water	KL	6.000	529.57	3177.42	M-189
		d) Overhead charges @ 10% on (a+b+c)				1319.66	
		e) Contractor's profit @ 16% on (a+b+c+d)				2322.60	
		Cost for 21 cum = a+b+c+d+e				16838.82	
		Rate per cum = (a+b+c+d+e)/ 21				801.85	
					say	802.00	
		Note This analysis provides for median and island with earthen top. In case the surface is required to be turfed or planted with shrubs, the same is required to be provided separately as per analysis given in the chapter on horticulture. In case surface finish is of hard type, the same may be provided separately as per approved design.					
4.15		Construction of Shoulders					
		A. Earthen Shoulders					
		The rate as applicable for sub-grade construction may be adopted.					
		B. Hard Shoulders					
		Rate as applicable for sub-base and or base may be adopted as per approved design.					
		C. Paved shoulders					
		The rate may be adopted as applicable for different layers of pavement depending upon approved design of paved shoulders.					
4.16	409	Footpaths and Separators					
		Construction of footpath/separator by providing a 150 mm compacted granular sub base as per clause 401 and 25 mm thick cement concrete grade M15, over laid with pre-cast concrete tiles in cement mortar 1:3 including provision of all drainage arrangements but excluding kerb channel..					
		Unit = sqm					
		Taking output = 300 sqm					
		a) Labour					
		Mate	day	1.360	582.53	792.24	L-12
		Mason	day	4.000	635.48	2541.94	L-11
		Mazdoor	day	30.000	529.57	15887.10	L-13
		b) Machinery					
		Vibratory road roller 8 -10 tonnes @60 cum per hour	hour	0.750	833.54	625.16	P&M-059
		Water tanker 6 KL capacity @ 1 trip per hour	hour	2.000	819.77	1639.55	P&M-060
		Concrete mixer 0.4/0.28 cum per hour	hour	6.000	375.99	2255.97	P&M-009
		c) Material					
		i) For Granular sub base material					
		53 mm to 26.5 mm @ 35 per cent	cum	20.790	1718.98	35737.67	M-029
		26.5 mm to 4.75 mm @ 45 per cent	cum	26.730	1803.72	48213.30	M-026
		2.36 mm below @ 20 per cent	cum	11.880	1856.67	22057.26	M-022
		ii) For cement concrete grade M157.5 cum					
		Aggregate 12 mm crushed @ 0.9 cum of concrete	cum	6.750	2145.82	14484.27	M-052
		Sand @ 0.45 cum/cum of concrete	cum	3.380	6977.61	23584.33	M-005
		Cement	tonne	1.880	7169.28	13478.25	M-081

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		iii) For cement plaster 1:3					
		Sand	cum	3.840	6977.61	26794.03	M-005
		Cement	tonne	1.830	7169.28	13119.78	M-081
		iv) Pre-cast cement concrete tiles					
		Tiles size 300 x 300 mm and 25 mm thick	each	3300.000	99.54	328475.26	M-184
		v) RCC pipes					
		Pipes 200 mm dia, 2.5 m long for drainage	metre	22.500	706.18	15889.08	M-137
		vi) Cost of water	KL	12.000	529.57	6354.84	M-189
		d) Overhead charges @ 10% on (a+b+c)				57193.00	
		e) Contractor's profit @ 16% on (a+b+c+d)				100659.68	
		Cost for 300 sqm = a+b+c+d+e				729782.71	
		Rate per sqm = (a+b+c+d+e)/300				2432.61	
					say	2433.00	
4.17	410	Crusher Run Macadam Base					
		Providing crushed stone aggregate, depositing on a prepared surface by hauling vehicles, spreading and mixing with a motor grader, watering and compacting with a vibratory roller to clause 410 to form a layer of sub-base/Base					
		Unit = cum					
		Taking output = 360 cum					
	A	By Mix in Place Method					
		a) Labour					
		Mate	day	0.480	582.53	279.61	L-12
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		Mazdoor	day	10.000	529.57	5295.70	L-13
		b) Machinery					
		Tractor attached with rotavator @ 25 cum per hour	hour	12.000	385.53	4626.32	P&M-054
		Motor grader 110 HP	hour	6.000	2324.81	13948.87	P&M-032
		Vibratory roller 8 -10 tonnes @ 60 cum per hour	hour	6.000	833.54	5001.26	P&M-059
		Water tanker 6 KL capacity	hour	6.000	819.77	4918.65	P&M-060
		c) Material					
		Aggregate at site					
		i) For 53 mm maximum size					
		63 mm to 45 mm @ 33 per cent	cum	157.460	1882.09	296354.11	M-038
		22.5 mm to 5.6 mm @ 32 per cent	cum	151.060	2371.41	358225.80	M-032
		Below 5.6 mm @ 35 per cent	cum	166.680	2204.07	367374.37	M-030
		Cost of water	KL	36.000	529.57	19064.52	M-189
		Or					
		ii) For 45 mm maximum size					
		45 mm to 22.5 mm @ 5 per cent	cum	24.120	1919.16	46290.17	M-034
		22.4 mm to 5.6 mm @ 50 per cent	cum	237.600	2371.41	563447.96	M-032
		Below 5.6 mm @ 45 per cent	cum	213.480	2204.07	470524.84	M-030
		Cost of water	KL	36.000	529.57	19064.52	M-189
4.17A		(i) For 53 mm maximum size					
		d) Overhead charges @ 10% on (a+b+c)				107646.61	
		e) Contractor's profit @ 16% on (a+b+c+d)				189458.03	
		Cost for 360.0 cum = a+b+c+d+e				1373570.72	
		Rate per cum = (a+b+c+d+e)/360				3815.47	
		or			say	3815.00	
4.17A		(ii) For 45 mm maximum size					
		d) Overhead charges @ 10% on (a+b+c)				113477.48	
		e) Contractor's profit @ 16% on (a+b+c+d)				199720.36	
		Cost for 360.0 cum = a+b+c+d+e				1447972.62	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per cum = (a+b+c+d+e)/360				4022.15	
					say	<u>4022.00</u>	
	Note	Any one of the aggregate grading may be adopted					
4.17	B	By Mixing Plant :					
		Unit = cum					
		Taking output = 225 cum (450 tonnes)					
		a) Labour					
		Mate	day	0.280	582.53	163.11	L-12
		Mazdoor skilled	day	1.000	688.44	688.44	L-15
		Mazdoor	day	6.000	529.57	3177.42	L-13
		b) Machinery					
		Wet mix plant @ 75 tonne per hour	hour	6.000	2018.51	12111.05	P&M-093
		Electric generator 125 KVA	hour	6.000	709.62	4257.74	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Motor grader 110 HP	hour	6.000	2324.81	13948.87	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	833.54	5001.26	P&M-059
		Water tanker 6 KL capacity	hour	3.000	819.77	2459.32	P&M-060
		Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
		c) Material					
		Aggregate at site					
		i) For 53 mm maximum size					
		63 mm to 45 mm @ 33 per cent	cum	98.400	1882.09	185197.79	M-038
		22.5 mm to 5.6 mm @ 32 per cent	cum	94.410	2371.41	223885.19	M-032
		Below 5.6 mm @ 35 per cent	cum	104.180	2204.07	229620.00	M-030
		Or					
		ii) For 45 mm maximum size					
		45 mm to 22.5 mm @ 5 per cent	cum	15.060	1919.16	28902.57	M-034
		22.4 mm to 5.6 mm @ 50 per cent	cum	148.500	2371.41	352154.98	M-032
		Below 5.6 mm @ 45 per cent	cum	133.430	2204.07	294089.05	M-030
		Cost of water	KL	18.000	529.57	9532.26	M-189
4.17 B	(i)	For 53 mm maximum size					
		d) Overhead charges @ 10% on (a+b+c)				73013.51	
		e) Contractor's profit @ 16% on (a+b+c+d)				128503.78	
		Cost for 225 cum = a+b+c+d+e				931652.43	
		Rate per cum = (a+b+c+d+e)/225				4140.68	
					say	<u>4141.00</u>	
4.17 B	(ii)	For 45 mm maximum size					
		d) Overhead charges @ 10% on (a+b+c)				77611.10	
		e) Contractor's profit @ 16% on (a+b+c+d)				136595.54	
		Cost for 225.0 cum = a+b+c+d+e				990317.63	
		Rate per cum = (a+b+c+d+e)/360				4401.41	
					say	<u>4401.00</u>	
4.18	Suggestive	Lime, Flyash Stabilised Soil Sub-Base					
		Construction of Sub-base using lime - Flyash admixture with granular soil, free from organic matter/ deleterious material or clayey silts and low plasticity clays having PI between 5 and 20 and liquid limit less than 25 and commercial dry lime, slaked at site or pre-slaked with CaO content not less than 50 per cent, Flyash to conform to gradation as per clause 4.3 of IRC: 88-1984, lime + Flyash content ranging between 10 to 30 per cent, the minimum un-confined compressive strength and CBR value after 28 days curing and 4 days soaking to be 7.5kg/sq. cm and 25 per cent respectively, all as specified in IRC: 88-1984					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Unit = cum					
		Taking output = 480 cum (720 tonnes, density 1.50 t/cum)					
		Assumptions made					
		Total mass taken for analysis = 720 t					
		Lime + Flyash admixture @ 20 per cent = 0.2 x 720=144 t					
		Soil = 720 -144 = 576 t					
		576 /1.6 = 360 cum					
		Lime + Flyash = 144 t					
		Ratio Lime 4 : Flyash 16					
		Lime = 29 kg.					
		Flyash = 115 kg.					
		a) Labour					
		Mate	day	0.240	582.53	139.81	L-12
		Mazdoor	day	6.000	529.57	3177.42	L-13
		Mazdoor (Skilled)	day	1.000	688.44	688.44	L-15
		b) Machinery					
		Hydraulic Excavator 0.90 cum bucket capacity @ 60cum/hr. for 360 cum soil	hour	6.000	1444.67	8668.00	P&M-026
		Tipper 10T capacity for carriage of soil 576 tonnes	tonne.km	576 x L	8.90	51423.35	Lead =10 km & P&M-058
		Tipper 10T capacity for carriage of 115 tonnes Flyash	tonne.km	115 x L	8.90	274198.58	Lead =268 km & P&M-058
		Tipper 10T capacity for carriage of 29 tonnes of lime from store to work site	hour	3.000	1006.18	3018.55	P&M-048
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				301.85	
		Tractor with disc harrows for pulverisation	hour	6.000	357.99	2147.94	P&M-053
		Motor Grader 110 HP @ 50 cum per hour for mixing in-place and grading	hour	9.600	2324.81	22318.19	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	833.54	5001.26	P&M-059
		Water tanker 6 KL capacity	hour	12.000	819.77	9837.29	P&M-060
		c) Material					
		Slaked Lime	tonne	29.000	13451.08	390081.18	M-188
		Compensation for earth taken from private source	cum	360.000	10.59	3812.90	M-092
		d) Overhead charges @ 10% on (a+b+c)				77481.48	
		e) Contractor's profit @ 16% on (a+b+c+d)				136367.40	
		Cost for 480 cum = a+b+c+d+e				988663.65	
		Rate per cum= (a+b+c+d+e)/480				2059.72	
					say	<u>2060.00</u>	
	Note	1.Compensation for earth will vary from place to place and will have to be assessed realistically as per particular ground situation. In case earth is available from Govt. land, compensation for earth will not be required. The position is required to be clearly stated in the cost estimate.					
		2.Cost of Flyash has not been considered as same will be available free of cost. Only carriage of Flyash has been provided.					
		3.Lime + Flyash has been taken as 20 per cent of total mass and ratio of lime and Flyash as 1:4 for estimating purposes. Total quantities will be as per approved design.					

CHAPTER - 5								
BASES AND SURFACE COURSES (BITUMINOUS)								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.1	502		Prime Coat					
			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.					
			Unit = sqm					
			Taking output = 3500 sqm					
			a) Labour					
			Mate	day	0.080	582.53	46.60	L-12
			Mazdoor	day	2.000	529.57	1059.14	L-13
			b) Machinery					
			Mechanical broom @ 1250 sqm per hour	hour	2.800	540.16	1512.45	P&M-031
			Air compressor 250 cfm	hour	2.800	887.56	2485.17	P&M-001
			Bitumen pressure distributor @ 1750 sqm per hour	hour	2.000	1041.13	2082.27	P&M-004
			Water tanker 6 KL capacity @ 1 trip per hour	hour	1.000	819.77	819.77	P&M-060
			c) Material					
			Bitumen emulsion @ 0.6 kg per sqm	tonne	2.100	64904.31	136299.04	M-077
			Cost of water	KL	6.000	529.57	3177.42	M-189
			d) Overhead charges @ 10% on (a+b+c)				14748.19	
			e) Contractor's profit @ 16% on (a+b+c+d)				25956.81	
			Cost for 3500 sqm = a+b+c+d+e				188186.86	
			Rate per sqm = (a+b+c+d+e)/3500				53.77	
						say	53.80	
		Note	Bitumen primer has been provided @ 0.60 kg per sqm as per clause 502.8. Payment shall be made with adjustment, plus or minus, for the variation between this quantity and the actual quantity approved by the Engineer after the preliminary trials referred to in clause No. 502.4.3.					
5.2	503		Tack Coat					
			Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.					
			Unit = sqm					
			Taking output = 3500 sqm					
			a) Labour					
			Mate	day	0.080	582.53	46.60	L-12
			Mazdoor	day	2.000	529.57	1059.14	L-13
			b) Machinery					
			Mechanical broom @ 1250 sqm per hour	hour	2.800	540.16	1512.45	P&M-031
			Air compressor 250 cfm	hour	2.800	887.56	2485.17	P&M-001
			Emulsion pressure distributor @ 1750 sqm per hour	hour	2.000	1041.13	2082.27	P&M-004
			c) Material					
			Bitumen emulsion @ 0.2 kg per sqm	tonne	0.700	64904.31	45433.01	M-077
			d) Overhead charges @ 10% on (a+b+c)				5261.86	
			e) Contractor's profit @ 16% on (a+b+c+d)				9260.88	
			Cost for 3500 sqm = a+b+c+d+e				67141.39	
			Rate per sqm = (a+b+c+d+e)/3500				19.18	
						say	19.20	
		Note	1. Bitumen emulsion has been provided @ 0.20 kg per sqm as per clause 503.8. Payment shall be made with adjustment, plus or minus, for the variation between this quantity and actual quantity approved by the Engineer after preliminary trials referred to in clause No. 503.4.3					
			2. An output of 3500 sqm has been considered in case of prime coat and tack coat which can be covered by bituminous courses on the same day.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.3	504	Bituminous Macadam					
		Providing and laying bituminous macadam with 100-120 TPH hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading premixed with bituminous binder, transported to site, laid over a previously prepared surface with paver finisher to the required grade, level and alignment and rolled as per clauses 501.6 and 501.7 to achieve the desired compaction					
		Unit = cum					
		Taking output = 205 cum (450 tonnes)					
		a) Labour					
		Mate	day	0.840	582.53	489.32	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	529.57	8473.12	L-13
		Skilled mazdoor for checking line & levels	day	5.000	688.44	3442.20	L-15
		b) Machinery					
		Batch mix HMP 100-120 TPH @ 75 tonne per hour actual output	hour	6.000	18085.02	108510.14	P&M-021
		Mechanical broom hydraulic @ 1250 sqm per hour	hour	2.200	540.16	1188.35	P&M-031
		Air compressor 250 cfm	hour	2.200	887.56	1952.63	P&M-001
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2718.81	16312.87	P&M-034
		Generator 250 KVA	hour	6.000	1433.02	8598.10	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	510.51	1990.97	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	833.54	3250.82	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	761.52	2969.93	P&M-045
		c) Material					
		i) Bitumen@ 3.3 per cent of mix	tonne	14.850	41363.28	614244.71	M-074
		weight of mix = 205 x 2.2 = 450 tonne					
		ii) Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 14.85 tonnes					
		Weight of aggregate = 450 - 14.85 = 435.15 tonnes					
		Taking density of aggregate = 1.5 ton/cum					
		Volume of aggregate = 290.1 cum					
		*Grading I (40 mm nominal size)					
		37.5 - 25 mm 15 per cent	cum	43.510	2563.12	111521.28	M-049
		25 - 10 mm 45 per cent	cum	130.550	2603.90	339938.51	M-046
		10 - 5 mm 25 per cent	cum	72.530	2394.19	173650.27	M-040
		5 mm and below 15 per cent	cum	43.510	2424.48	105488.99	M-030
		or					
		Grading II (19 mm nominal size)					
		25 - 10 mm 40 per cent	cum	116.040	2603.90	302155.99	M-046
		10 - 5 mm 40 per cent	cum	116.040	2394.19	277821.28	M-040
		5 mm and below 20 per cent	cum	58.020	2424.48	140668.15	M-030
		* Any one of the alternative may be adopted as per approved design					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	(i)	for Grading I (40 mm nominal size)					
		d) Overhead charges @ 10% on (a+b+c)				155164.72	
		e) Contractor's profit @ 16% on (a+b+c+d)				273089.90	
		Cost for 205 cum = a+b+c+d+e				1979901.77	
		Rate per cum = (a+b+c+d+e)/205 (For Grading I)				9658.06	
					say	<u>9658.00</u>	
	(ii)	for Grading II (19 mm nominal size)					
		d) Overhead charges @ 10% on (a+b+c)				154169.35	
		e) Contractor's profit @ 16% on (a+b+c+d)				271338.06	
		Cost for 205 cum = a+b+c+d+e				1967200.95	
		Rate per cum = (a+b+c+d+e)/205 (For Grading-II)				9596.10	
					say	<u>9596.00</u>	
	Note	<p>*1. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a</p> <p>2. Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.</p> <p>3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.</p> <p>4. In case BM is laid over freshly laid tack coat, provision of Mechanical broom and 2 mazdoors for the same shall be deleted as the same has been included in the cost of tack coat.</p>					
5.4	505	Bituminous Penetration Macadam					
		Construction of penetration macadam over prepared Base by providing a layer of compacted crushed coarse aggregate using chips spreader with alternate applications of bituminous binder and key aggregates and rolling with a smooth wheeled steel roller 8-10 tonne capacity to achieve the desired degree of compaction					
	A	50 mm thick					
		Unit = sqm					
		Taking output = 4500 sqm (225 cum)					
		a) Labour					
		Mate	day	0.320	582.53	186.41	L-12
		Mazdoor including for brooming of key aggregates	day	6.000	529.57	3177.42	L-13
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		b) Machinery					
		Hydraulic self propelled chip spreader both for aggregates and key aggregates @ 1500 sqm per hour for 4500 x 2 sqm = 9000 sqm	hour	6.000	2557.82	15346.94	P&M-025
		Bitumen pressure distributor for @ 1750 sqm per hour	hour	2.570	1041.13	2675.72	P&M-004
		Tipper 5.5 cum capacity for carriage of aggregates from stockpile to chip spreader	hour	10.000	1006.18	10061.83	P&M-048
		Vibratory roller 8 tonnes	hour	6.000	833.54	5001.26	P&M-059
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		c) Material					
		Bitumen @ 5 kg per sqm	tonne	22.500	41363.28	930673.80	M-074
		Crushed stone coarse aggregate passing 45 mm and retained on 2.8 mm sieve @ 0.06 cum per sqm	cum	270.000	1942.46	524464.84	M-033
		Key aggregates passing 22.4 mm and retained on 2.8 mm sieve @ 0.015 cum per sqm	cum	67.500	2374.59	160284.92	M-031
		d) Overhead charges @ 10% on (a+b+c)				165883.59	
		e) Contractor's profit @ 16% on (a+b+c+d)				291955.12	
		Cost for 4500 sqm = a+b+c+d+e				2116674.62	
		Rate per sqm = (a+b+c+d+e)/4500				470.37	
					say	<u>470.00</u>	
	Note	2 tippers will be needed to match the capacity of chip spreader and front end loader.					
5.4	B	75 mm thick					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Unit = sqm					
		Taking output = 4500 sqm (337.5 cum compacted).					
		a) Labour					
		Mate	day	0.400	582.53	233.01	L-12
		Mazdoor including for brooming of key aggregates	day	8.000	529.57	4236.56	L-13
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		b) Machinery					
		Hydraulic self propelled chip spreader both for aggregates and key aggregates @ 1500 sqm per hour for 4500 x 2 sqm	hour	6.000	2557.82	15346.94	P&M-025
		Bitumen pressure distributor for @ 1750 sqm per hour	hour	2.570	1041.13	2675.72	P&M-004
		Tipper 5.5 cum capacity for carriage of aggregates from stockpile to chip spreader	hour	10.000	1006.18	10061.83	P&M-048
		Vibratory roller 8 tonnes	hour	6.000	833.54	5001.26	P&M-059
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		c) Material					
		Bitumen @ 6.8 kg per sqm	tonne	30.600	41363.28	1265716.37	M-074
		Crushed stone coarse aggregate (loose passing 63 mm and retained on 2.8 mm sieve @ 0.09 cum per sqm	cum	405.000	2130.88	863007.75	M-037
		Key aggregates passing 26.5 mm and retained on 2.8 mm sieve @ 0.018 cum per sqm	cum	81.000	1984.09	160711.01	M-026
		d) Overhead charges @ 10% on (a+b+c)				233395.32	
		e) Contractor's profit @ 16% on (a+b+c+d)				410775.77	
		Cost for 4500 sqm = a+b+c+d+e				2978124.31	
		Rate per sqm = (a+b+c+d+e)/4500				661.81	
					say	662.00	
		Note 2 tippers and 2 rollers will be needed to match the capacity of chip spreader and front end loader.					
5.5	506	Built-up-Spray Grout					
		Providing, laying and rolling of built-up-spray grout layer over prepared base consisting of a two layer composite construction of compacted crushed coarse aggregates using motor grader for aggregates. Key stone chips spreader may be used with application of bituminous binder after each layer, and with key aggregates placed on top of the second layer to serve as a Base conforming to the line, grades and cross-section specified, the compacted layer thickness being 75 mm.					
		Unit = sqm					
		Taking output = 3000 sqm (225 cum)					
		a) Labour					
		Mate	day	0.400	582.53	233.01	L-12
		Mazdoor including for brooming of key aggregates	day	8.000	529.57	4236.56	L-13
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		b) Machinery					
		Hydraulic self propelled chip spreader both for aggregates and key aggregates @ 1500 sqm per hour for 3000 x 3 sqm	hour	6.000	2557.82	15346.94	P&M-025
		Bitumen pressure distributor for 3000 x 2 sqm @ 1750 sqm per hour	hour	3.430	1041.13	3571.09	P&M-004
		Tipper 5.5 cum capacity	hour	10.000	1006.18	10061.83	P&M-048
		Vibratory roller 8 tonnes	hour	6.000	833.54	5001.26	P&M-059
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Material					
		Bitumen 30 kg per 10 sqm @ 15 kg per 10 sqm for each layer	tonne	9.000	41363.28	372269.52	M-074
		Crushed stone coarse aggregate passing 53 mm and retained on 2.8 mm sieve @ 0.5 cum per 10 sqm for each layer	cum	300.000	1953.05	585916.13	M-035
		Key aggregates passing 22.4 mm and retained on 2.8 mm sieve @ 0.13 cum per 10 sqm	cum	39.000	2374.59	92609.06	M-031
		d) Overhead charges @ 10% on (a+b+c)				109620.82	
		e) Contractor's profit @ 16% on (a+b+c+d)				192932.64	
		Cost for 3000 sqm = a+b+c+d+e				1398761.64	
		Rate per sqm = (a+b+c+d+e)/3000				466.25	
					say	466.00	
		Note 2 tippers will be needed to match the capacity of hydraulic chip spreader and front end loader.					
5.6	507	Dense Graded Bituminous Macadam					
		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					
		Unit = cum					
		Taking output = 195 cum (450 tonnes)					
		a) Labour					
		Mate	day	0.840	582.53	489.32	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	529.57	8473.12	L-13
		Skilled mazdoor for checking line & levels	day	5.000	688.44	3442.20	L-15
		b) Machinery					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	15726.11	94356.65	P&M-022
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2718.81	16312.87	P&M-034
		Generator 250 KVA	hour	6.000	1433.02	8598.10	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
		smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	510.51	1990.97	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	833.54	3250.82	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	761.52	2969.93	P&M-045
		c) Materials					
		Bitumen @ 4.25 per cent of weight of mix	tonne	19.130	41771.81	799094.63	M-074
		Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 19.13 tonnes					
		Weight of aggregate = 450 -19.13 = 430.87 tonnes					
		Taking density of aggregate = 1.5 ton/cum					
		Volume of aggregate = 287.25 cum					
		Grading - 140 mm (Nominal Size)					
		37.5 - 25 mm 22 per cent	cum	63.190	2563.12	161963.44	M-049
		25 - 10 mm 13 per cent	cum	37.340	2603.90	97229.45	M-046
		10 - 4.75 mm 19 per cent	cum	54.580	2394.19	130674.64	M-040
		4.75 mm and below 44 per cent	cum	126.390	2424.48	306429.63	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	13451.08	115948.27	M-188

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		or					
		Grading - II 19 mm (Nominal Size)					
		25 - 10 mm 30 per cent	cum	86.160	2603.90	224351.61	M-046
		10 - 5 mm 28 per cent	cum	80.430	2394.19	192564.34	M-040
		5 mm and below 40 per cent	cum	114.900	2424.48	278572.39	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	13451.08	115948.27	M-188
		* Any one of the alternative may be adopted as per approved design					
	(i)	For Grading I (40 mm nominal size)					
		d) Overhead charges @ 10% on (a+b+c)				180084.90	
		e) Contractor's profit @ 16% on (a+b+c+d)				316949.42	
		Cost for 205 cum = a+b+c+d+e				2297883.30	
		Rate per cum = (a+b+c+d+e)/195 (For Grading I)				11784.02	
					say	11784.00	
	(ii)	For Grading II (19 mm nominal size)					
		d) Overhead charges @ 10% on (a+b+c)				180004.02	
		e) Contractor's profit @ 16% on (a+b+c+d)				316807.07	
		Cost for 205 cum = a+b+c+d+e				2296851.24	
		Rate per cum = (a+b+c+d+e)/195 (For Grading-II)				11778.72	
					say	11779.00	
	Note	*1. Although the roller are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a factor of 0.65					
		2. Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
		4. In case DBM is laid over freshly laid tack coat, provision of mechanical broom and 2 mazdoors shall be deleted as the same has been included in the cost of tack coat.					
		5. The individual density for each size of aggregates to be used for construction i.e. 37.5-25 mm, 25-10 mm etc. should be found in the laboratory and accordingly the quantities should be amended for use in field. The average density of 1.5 tonne/cum is only a reference density in this Data Book.					
		6. The individual percentage of aggregates should be calculated from the total weight of dry aggregates i.e. excluding the weight of bitumen. The weight of filler will also be 2 per cent by weight of dry aggregates.					
5.7	508	Semi-Dense Bituminous Concrete					
		Providing and laying semi dense bituminous concrete 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 @ 4.5 to 5 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. 508 complete in all respects					
		Unit = cum					
		Taking output = 195 cum (450 tonnes)					
		a) Labour					
		Mate	day	0.840	582.53	489.32	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	529.57	8473.12	L-13
		Skilled mazdoor for checking line & levels	day	5.000	688.44	3442.20	L-15
		b) Machinery					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Batch mix HMP @ 75 tonne per hour	hour	6.000	15726.11	94356.65	P&M-022
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2718.81	16312.87	P&M-034
		Generator 250 KVA	hour	6.000	1433.02	8598.10	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	510.51	1990.97	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	833.54	3250.82	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller	hour	6.00x0.65*	761.52	2969.93	P&M-045
		c) Material					
		* Grading I: 13 mm (Nominal Size)					
		i) Bitumen @ 4.5 per cent of weight of mix	tonne	20.250	41771.81	845879.05	M-074
		ii) Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 20.25 tonnes					
		Weight of aggregate = 450-20.25 = 429.75 tonnes					
		Taking density of aggregate = 1.5 ton/cum					
		Volume of aggregate = 286.5 cum					
		13.2 - 10 mm 20 per cent	cum	57.300	2360.40	135250.86	M-044
		10 - 5 mm 38 per cent	cum	108.870	2394.19	260654.97	M-040
		5 mm and below 40 per cent	cum	114.600	2424.48	277845.05	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	13451.08	115948.27	M-188
		or					
		Grading II: 10 mm (Nominal Size)					
		Bitumen @ 5 per cent of weight of mix	tonne	22.500	41771.81	939865.61	M-074
		weight of mix = 450 tonne					
		Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 22.5 tonnes					
		Weight of aggregate = 450 -22.50 = 427.50 tonnes					
		Taking density of aggregate = 1.5 ton/cum					
		Volume of aggregate = 285 cum					
		9.5 - 4.75 mm @ 57 per cent	cum	162.450	2394.19	388935.43	M-040
		4.75 and below @ 41 per cent	cum	116.850	2424.48	283300.12	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	13451.08	115948.27	M-188
		*Any one of the alternative may be adopted as per approved design					
	(i)	for Grading I (13 mm nominal size)					
		d) Overhead charges @ 10% on (a+b+c)				182508.71	
		e) Contractor's profit @ 16% on (a+b+c+d)				321215.33	
		Cost for 205 cum = a+b+c+d+e				2328811.16	
		Rate per cum = (a+b+c+d+e)/195 (For Grading I)				11942.62	
					say	11943.00	
5.7	(ii)	for Grading II (10 mm nominal size)					
		d) Overhead charges @ 10% on (a+b+c)				191755.84	
		e) Contractor's profit @ 16% on (a+b+c+d)				337490.27	
		Cost for 205 cum = a+b+c+d+e				2446804.46	
		Rate per cum = (a+b+c+d+e)/195 (For Grading-II)				12547.72	
					say	12548.00	
	Note	*1. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		2.Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
		4. In case SDBC is laid over freshly laid tack coat, provision of broom and 2 mazdoor shall be deleted as the same has been included in the cost of tack coat.					
		5. The quantity of Bitumen to be adjusted as per job mix formula.					
5.8	509	Bituminous Concrete					
		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					
		Unit = cum					
		Taking output = 191 cum (450 tonnes)					
		a) Labour					
		Mate	day	0.840	582.53	489.32	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	529.57	8473.12	L-13
		Skilled mazdoor for checking line & levels	day	5.000	688.44	3442.20	L-15
		b) Machinery					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	15726.11	94356.65	P&M-022
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2718.81	16312.87	P&M-034
		Generator 250 KVA	hour	6.000	1433.02	8598.10	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	510.51	1990.97	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	833.54	3250.82	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	761.52	2969.93	P&M-045

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Material					
		i) Bitumen @ 5 per cent of weight of mix	tonne	22.500	41771.81	939865.61	M-074
		ii) Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 22.5 tonnes					
		Weight of aggregate = 450 - 22.50 = 427.50 tonnes					
		Taking density of aggregate = 1.5 ton/cum					
		Volume of aggregate = 285 cum					
		* Grading - I-19 mm (Nominal Size)					
		20 - 10 mm 35 per cent	cum	99.750	2609.72	260319.61	M-045
		10 - 5 mm 23 per cent	cum	65.550	2394.19	156938.86	M-040
		5 mm and below 40 per cent	cum	114.000	2424.48	276390.36	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	13451.08	115948.27	M-188
		or					
		Grading - II-13 mm (Nominal Size)					
		13.2 - 10 mm 30 per cent	cum	85.500	2360.40	201814.11	M-044
		10 - 5 mm 25 per cent	cum	71.250	2394.19	170585.72	M-040
		5 mm and below 43 per cent	cum	122.550	2424.48	297119.64	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	13451.08	115948.27	M-188
		*Any one of the alternative may be adopted as per approved design					
	(i)	for Grading-I (13 mm nominal size)					
		d) Overhead charges @ 10% on (a+b+c)				193897.16	
		e) Contractor's profit @ 16% on (a+b+c+d)				341259.01	
		Cost for 205 cum = a+b+c+d+e				2474127.80	
		Rate per cum = (a+b+c+d+e)/191				12953.55	
					say	12954.00	
5.8	(ii)	for Grading-II(10 mm nominal size)					
		d) Overhead charges @ 10% on (a+b+c)				191484.23	
		e) Contractor's profit @ 16% on (a+b+c+d)				337012.24	
		Cost for 205 cum = a+b+c+d+e				2443338.73	
		Rate per cum = (a+b+c+d+e)/191 (For Grading-II)				12792.35	
					say	12792.00	
	Note	*1. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a					
		2.Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
		4. In case BC is laid over freshly laid tack coat, provision of mechanical broom and 2 mazdoors shall be deleted as the same has been included in the cost of tack coat.					
		5. The individual density for each size of aggregates to be used for construction i.e. 37.5-25 mm, 25-10 mm etc. should be found in the laboratory and accordingly the quantities should be ammended for use in field. The average density of 1.5 tonne/cum is only a reference density in this Data Book.					
		6. The individual percentage of aggregates should be calculated from the total weight of dry aggregates i.e.. excluding the weight of bitumen. The weight of filler will also be 2 per cent by weight of dry aggregates.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.9	510	Surface Dressing					
		Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller					
		Unit = sqm					
		Taking output = 9000 sqm					
	Case - I	19 mm nominal chipping size					
		a) Labour					
		Mate	day	0.440	582.53	256.31	L-12
		Mazdoor	day	9.000	529.57	4766.13	L-13
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	540.16	3889.16	P&M-031
		Air compressor 250 cfm	hour	7.200	887.56	6390.43	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	2557.82	15346.94	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	1006.18	6037.10	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Bitumen pressure distributor	hour	6.000	1041.13	6246.81	P&M-004
		Smooth wheeled roller 8-10 tonne weight	hour	6.000	510.51	3063.03	P&M-044
		c) Material					
		Bitumen @ 1.20 kg per sqm	tonne	10.800	41363.28	446723.42	M-074
		Crushed stone chipping, 19 mm nominal size @ 0.015 cum per sqm	cum	135.000	2372.47	320283.87	M-053
		d) Overhead charges @ 10% on (a+b+c)				81996.60	
		e) Contractor's profit @ 16% on (a+b+c+d)				144314.01	
		Cost for 9000 sqm = a+b+c+d+e				1046276.59	
		Rate per sqm = (a+b+c+d+e)/9000				116.25	
					say	116.00	
5.9		Case - II 13 mm nominal size chipping					
		a) Labour					
		Mate	day	0.440	582.53	256.31	L-12
		Mazdoor	day	9.000	529.57	4766.13	L-13
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	540.16	3889.16	P&M-031
		Air compressor 250 cfm	hour	7.200	887.56	6390.43	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	2557.82	15346.94	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	1006.18	6037.10	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1041.13	6246.81	P&M-004
		Vibratory roller 8-10 tonne weight	hour	6.000	833.54	5001.26	P&M-059
		c) Material					
		Bitumen @ 1.00 kg per sqm	tonne	9.000	41363.28	372269.52	M-074
		Crushed stone chipping, 13 mm nominal size @ 0.01 cum per sqm	cum	90.000	2145.82	193123.55	M-052
		d) Overhead charges @ 10% on (a+b+c)				62029.00	
		e) Contractor's profit @ 16% on (a+b+c+d)				109171.04	
		Cost for 9000 sqm = a+b+c+d+e				791490.01	
		Rate per sqm = (a+b+c+d+e)/9000				87.94	
					say	88.00	
		Note					
		1. Where the proposed aggregate fails to pass the stripping test, an approved adhesion agent may be added to the binder as per clause 510.2.4. Alternatively, chips may be pre-coated as per clause 510.2.5					
		2. Input for the second coat, where required, will be the same as per the 1st coat mentioned above					
5.10	511	Open - Graded Premix Surfacing					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen or cut-back or emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 tonne capacity, finished to required level and grades.					
		Unit = sqm					
		Taking output = 10250 sqm (205 cum)					
	(i)	Case - I: Mechanical method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour .					
		a) Labour					
		Mate	day	0.840	582.53	489.32	L-12
		Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	529.57	8473.12	L-13
		Skilled mazdoor for checking line & levels	day	5.000	688.44	3442.20	L-15
		b) Machinery					
		i) Batch type HMP 75 tonne per hour	hour	6.000	18085.02	108510.14	P&M-021
		ii) Electric Generator Set 250 KVA	hour	6.000	1433.02	8598.10	P&M-081
		iii) Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		iv) Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
		v) Paver finisher hydrostatic with sensor attachment	hour	6.000	2718.81	16312.87	P&M-034
		iv) Smooth wheeled/tandem roller 8-10 tonnes weight	hour	6.000	761.52	4569.13	P&M-045
		c) Material					
		Bitumen@ 14.60 kg per 10 sqm	tonne	14.970	41363.28	619208.30	M-074
		Crushed stone chipping, 13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	276.750	2383.70	659688.98	M-043
		d) Overhead charges @ 10% on (a+b+c)				147891.71	
		e) Contractor's profit @ 16% on (a+b+c+d)				260289.41	
		Cost for 10250 sqm = a+b+c+d+e				1887098.21	
		Rate per sqm = (a+b+c+d+e)/10250				184.11	
					say	184.00	
	Note	If a premix sand seal coat of 'B' type is proposed, the same is required to be provided over the open graded premix carpet immediately on the same day. As the same HMP and other machines will be used for laying of premix sand seal coat, out of 6 effective working hours, 4.00 hours may be utilised for laying of premix carpet and balance 2.00 hours for the seal coat. The rate for the premix sand seal coat under clause 513 (case II) has been worked out accordingly by utilising the HMP for 2.00 hours for the purpose of seal coat. In case type 'A' seal coat is proposed, HMP can be worked for six hours for the premix carpet as type 'A' seal coat does not require the use of HMP.					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.10		(ii)	Case - II: Open-Graded Premix Surfacing using cationic Bitumen Emulsion					
			Unit = sqm					
			Taking output = 900 sqm (24.3 cum)					
			a) Labour					
			Mate	day	0.800	582.53	466.02	L-12
			Mazdoor	day	18.000	529.57	9532.26	L-13
			Mazdoor skilled	day	2.000	688.44	1376.88	L-15
			b) Machinery					
			Concrete mixer 0.4/0.28 cum capacity	hour	6.000	375.99	2255.97	P&M-009
			Smooth wheeled steel roller 8-10 tonne	hour	6.000	510.51	3063.03	P&M-044
			c) Material					
			Cationic Bitumen Emulsion @ 21.50 kg per 10 sqm	tonne	1.940	45085.61	87466.07	M-073
			Crushed stone aggregates 13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	24.300	2383.70	57923.91	M-043
			d) Overhead charges @ 10% on (a+b+c)				16208.41	
			e) Contractor's profit @ 16% on (a+b+c+d)				28526.81	
			Cost for 900 sqm = a+b+c+d+e				206819.37	
			Rate per sqm = (a+b+c+d+e)/900				229.80	
						say	230.00	
5.11	512		Close Graded Premix Surfacing/Mixed Seal Surfacing					
		Case I	Mechanical means using HMP of appropriate capacity not less than 75 tonnes/hour.					
			Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.09 mm (Type-a) or 13.2 mm to 0.09 mm (Type-b) aggregates using penetration grade bitumen to the required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a Smooth wheeled roller 8-10 tonne capacity, and finishing to required level and grade.					
			Unit = sqm					
			Taking output = 10250 sqm (205 cum)					
			a) Labour					
			Mate	day	0.840	582.53	489.32	L-12
			Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	529.57	8473.12	L-13
			Skilled mazdoor for checking line & levels	day	5.000	688.44	3442.20	L-15
			b) Machinery					
			i) HMP of appropriate capacity.	hour	6.000	18085.02	108510.14	P&M-021
			ii) Electric Generator Set 250 KVA	hour	6.000	1433.02	8598.10	P&M-081
			iii) Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
			iv) Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
			Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
			v) Paver finisher hydrostatic with sensor attachment	hour	6.000	2718.81	16312.87	P&M-034
			iv) Smooth wheeled 8-10 tonnes weight	hour	6.000	510.51	3063.03	P&M-044
			c) Material					
			Type - A					
			* Bitumen @ 22 kg per 10 sqm	tonne	22.500	41363.28	930673.80	M-074
			Stone crushed aggregates 11.2 mm to 0.09 @ 0.27 cum per 10 sqm	cum	276.750	2391.86	661945.98	M-041
			or					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Type - B					
		Bitumen @ 19 kg per 10 sqm	tonne	19.480	41363.28	805756.69	M-074
		Stone crushed aggregates 13.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	276.750	2389.53	661301.12	M-042
		d) Overhead charges @ 10% on (a+b+c)				179113.35	
		e) Contractor's profit @ 16% on (a+b+c+d)				315239.50	
		Cost for 10250 sqm = a+b+c+d+e				2285486.34	
		Rate per sqm = (a+b+c+d+e)/10250				222.97	
					say	223.00	
		* Any one of the alternative may be adopted					
5.12	513	Seal Coat					
		Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A and B seal coats					
		Unit = sqm					
		Taking output = 10250 sqm (92.25 cum)					
	(i)	Case - I : Type A					
		a) Labour					
		Mate	day	0.240	582.53	139.81	L-12
		Mazdoor	day	6.000	529.57	3177.42	L-13
		b) Machinery					
		Hydraulic self propelled chip spreader	hour	6.000	2557.82	15346.94	P&M-025
		Tipper 5.5 cum capacity	hour	6.000	1006.18	6037.10	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1041.13	6246.81	P&M-004
		Smooth wheeled roller 8 -10 tonne weight	hour	6.000	510.51	3063.03	P&M-044
		c) Material					
		Bitumen@ 9.80 kg per 10 sqm	tonne	10.050	41363.28	415700.96	M-074
		Crushed stone chipping of 6.7 mm size defined as 100 per cent passing 11.2 mm sieve and retained on 2.36 mm sieve applied @ 0.09 cum per 10 sqm	cum	92.250	2188.18	201859.86	M-050
		d) Overhead charges @ 10% on (a+b+c)				65715.78	
		e) Contractor's profit @ 16% on (a+b+c+d)				115659.78	
		Cost for 10250 sqm = a+b+c+d+e				838533.39	
		Rate per sqm = (a+b+c+d+e)/10250				81.81	
					say	82.00	
		Note Since seal coat is provided immediately over the bituminous layers, mechanical broom for clearing has not been catered.					
5.12	(ii)	Case - II : Type B					
		Providing and laying of premix sand seal coat with HMP of appropriate capacity not less than 75 tonnes/ hours using crushed stone chipping 6.7 mm size and penetration bitumen of suitable grade.					
		Unit = sqm					
		Taking output = 7858 sqm (47.16 cum)					
		a) Labour					
		Mate	day	0.160	582.53	93.20	L-12
		Mazdoor	day	4.000	529.57	2118.28	L-13
		b) Machinery					
		HMP of 75 tonnes/hour.	hour	2.000	15726.11	31452.22	P&M-022
		Electric Generator Set 250 KVA	hour	2.000	1433.02	2866.03	P&M-081
		Front end loader 1 cum bucket capacity	hour	2.000	930.98	1861.97	P&M-017
		Tipper 10 tonne capacity	tonne.km	104 x 'L'	8.90	9252.65	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				925.26	
		Paver finisher hydrostatic with sensor attachment	hour	2.000	2718.81	5437.62	P&M-034
		Smooth wheeled 8-10 tonnes capacity	hour	2.000	510.51	1021.01	P&M-044
		c) Material					
		Bitumen@ 6.80 kg per 10 sqm	tonne	5.340	41363.28	220879.92	M-074

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Crushed stone chipping of 6.7 mm size defined as passing 11.2 mm sieve and retained on 2.36 mm sieve applied @ 0.06 cum per 10 sqm	cum	47.160	2407.00	113514.17	M-050
			d) Overhead charges @ 10% on (a+b+c)				38942.23	
			e) Contractor's profit @ 16% on (a+b+c+d)				68538.33	
			Cost for 7858 sqm = a+b+c+d+e				496902.89	
			Rate per sqm = (a+b+c+d+e)/7858				63.24	
						say	63.00	
		Note	Since seal coat is required to be provided over the premix carpet on the same day, out of the 6 working hours of the HMP, 4.00 hours are proposed to be utilised for the premix carpet and the balance 2.00 hours for the seal coat. Hence 2.00 hours have been considered for this case. This may be linked to rate analysis worked out under clause 511.					
5.13	514		Supply of Stone Aggregates for Pavement Courses					
			Supply of stone aggregates from approved sources conforming to the physical requirement, specified in the respective specified clauses, including royalties, fees rents, collection, transportation, stacking and testing and measured in cum as per clause 514.5					
			Competitive market rates to be as ascertained. Alternatively, rates for stone crushing given in chapter 1 may be adopted, if found economical. In case for supply of aggregates at site are not available, nearest crusher site may be as ascertained. Loading and un-loading charges and cost of carriage may be added to these rates to arrive at the cost at site.					
5.14	515		Mastic Asphalt					
			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.					
			Unit = sqm					
			Taking output = 35.00 sqm (0.87 cum) assuming a density of 2.3 tonnes/cum.-2 tonnes					
			a) Labour					
			Mate	day	0.440	582.53	256.31	L-12
			Mazdoor	day	10.000	529.57	5295.70	L-13
			Mazdoor skilled	day	1.000	688.44	688.44	L-15
			b) Machinery					
			Mechanical broom @ 1250 sqm per hour	hour	0.060	540.16	32.41	P&M-031
			Air compressor 250 cfm	hour	0.060	887.56	53.25	P&M-001
			Mastic cooker 1 tonne capacity	hour	6.000	536.98	3221.90	P&M-030
			Bitumen boiler 1500 litres capacity	hour	6.000	317.74	1906.45	P&M-005
			Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.000	357.99	357.99	P&M-053

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Material					
		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	41363.28	8438.11	M-074
		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	1378.81	537.74	M-021
		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	13451.08	4842.39	M-188
		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	2167.00	1191.85	M-043
		v) Pre-coated stone chips of 13.2 mm nominal size for skid resistance = $35 \times 0.005/10 = 0.018$	cum	0.018	4842.39	87.16	M-142
		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	41.00	20.50	M-074
		d) Overhead charges @ 10% on (a+b+c)				2693.02	
		e) Contractor's profit @ 16% on (a+b+c+d)				4739.72	
		Cost for 35.00 sqm = a+b+c+d+e				34362.94	
		Rate per sqm = (a+b+c+d+e)/35				981.80	
					say	982.00	
	Note	1.The rates for 50 mm & 40 mm thick layers may be worked out on pro-rata basis.					
		2.Where tack coat is required to be provided before laying mastic asphalt, the same is required to be measured and paid separately.					
		3.The quantities of binder, filler and aggregates are for estimating purpose. Exact quantities shall be as per mix design.					
		4.This rate analysis is based on design made by CRRRI for a specific case and is meant for estimating purposes only. Actual design is required to be done for each case.					
5.15	516	Slurry Seal					
		Providing and laying slurry seal consisting of a mixture of fine aggregates, portland cement filler, bituminous emulsion and water on a road surface including cleaning of surface, mixing of slurry seal in a suitable mobile plant, laying and compacting to provide even riding surface					
	(i)	5 mm thickness					
		Unit = sqm					
		Taking output = 16000 sqm (80 cum)					
		Taking density of 2.2 tonnes per cum					
		weight of mix = 176 tonnes					
		a) Labour					
		Mate	day	0.240	582.53	139.81	L-12
		Mazdoor	day	6.000	529.57	3177.42	L-13
		b) Machinery					
		Mechanical broom	hour	6.000	540.16	3240.97	P&M-031
		Air compressor 250 cfm	hour	6.000	887.56	5325.35	P&M-001
		Mobile slurry seal equipment	hour	6.000	940.52	5643.10	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler.	hour	6.000	1006.18	6037.10	P&M-048
		Pneumatic tyred roller with individual wheel load not exceeding 1.5 tonnes	hour	6.000	1262.49	7574.97	P&M-037
		Water tanker 6 KL capacity	hour	2.000	819.77	1639.55	P&M-060
		c) Material					
		Residual Binder @ 11 per cent of mix $80 \times 2.2 \times 0.11$	tonne	19.360	64904.31	1256547.34	M-077

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Fine aggregate 4.75 mm and below 87 per cent of total mix, $80 \times 2.2 \times 0.87 = 153.12$ tonnes. Taking density 1.5, $= 153.12/1.5 = 102.08$ cum	cum	102.080	2204.07	224991.45	M-030
		Filler @ 2 per cent of total mix = $80 \times 2.2 \times 0.02$	tonne	3.520	13451.08	47347.78	M-188
		Cost of water	KL	12.000	529.57	6354.84	M-189
		d) Overhead charges @ 10% on (a+b+c)				157360.56	
		e) Contractor's profit @ 16% on (a+b+c+d)				276954.58	
		Cost for 16000 sqm = a+b+c+d+e				2007920.73	
		Rate per sqm = (a+b+c+d+e)/16000				125.50	
					say	125.00	
5.15	(ii)	3 mm thickness					
		Unit = sqm					
		Taking output = 20000 sqm (60 cum)					
		a) Labour					
		Mate	day	0.200	582.53	116.51	L-12
		Mazdoor	day	5.000	529.57	2647.85	L-13
		b) Machinery					
		Mechanical broom	hour	6.000	540.16	3240.97	P&M-031
		Air compressor 250 cfm	hour	6.000	887.56	5325.35	P&M-001
		Mobile slurry seal equipment	hour	6.000	940.52	5643.10	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler	hour	6.000	1006.18	6037.10	P&M-048
		Water tanker 6 KL capacity	hour	2.000	819.77	1639.55	P&M-060
		c) Material					
		Residual Binder @ 13 per cent of mix = $60 \times 2.2 \times 0.13$	tonne	17.160	64904.31	1113757.87	M-077
		Fine aggregate 3 mm and below 85 per cent of total mix, $60 \times 2.2 \times 0.85 = 112.2$ tonnes. Taking density 1.5,	cum	74.800	1856.67	138879.07	M-022
		Filler @ 2 per cent of total mix = $60 \times 2.2 \times 0.02$	tonne	2.640	13451.08	35510.84	M-188
		Cost of water	KL	12.000	529.57	6354.84	M-189
		d) Overhead charges @ 10% on (a+b+c)				132473.89	
		e) Contractor's profit @ 16% on (a+b+c+d)				233154.05	
		Cost for 30000 sqm = a+b+c+d+e				1690366.89	
		Rate per sqm = (a+b+c+d+e)/20000				84.52	
					say	85.00	
5.15	(iii)	1.5 mm thickness					
		Unit = sqm					
		Taking output = 24000 sqm (36 cum)					
		a) Labour					
		Mate	day	0.200	582.53	116.51	L-12
		Mazdoor	day	5.000	529.57	2647.85	L-13
		b) Machinery					
		Mechanical broom	hour	6.000	540.16	3240.97	P&M-031
		Air compressor 250 cfm	hour	6.000	887.56	5325.35	P&M-001
		Mobile slurry seal equipment	hour	6.000	940.52	5643.10	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler.	hour	6.000	1006.18	6037.10	P&M-048
		Water tanker 6 KL capacity	hour	2.000	819.77	1639.55	P&M-060
		c) Material					
		Residual Binder @ 16 per cent of mix, $36 \times 2.2 \times 0.16$	tonne	12.670	64904.31	822337.54	M-077
		Fine aggregate 2.36 mm and below 82 per cent of total mix, $36 \times 2.2 \times 0.82 = 64.94$ tonnes. Taking density 1.5	cum	43.300	1856.67	80393.90	M-022
		Filler @ 2 per cent of total mix = $36 \times 2.2 \times 0.02$	tonne	1.580	13451.08	21252.70	M-188
		Cost of water	KL	12.000	529.57	6354.84	M-189
		d) Overhead charges @ 10% on (a+b+c)				96057.53	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Contractor's profit @ 16% on (a+b+c+d)				169061.25	
		Cost for 24000 sqm = a+b+c+d+e				1225694.09	
		Rate per sqm = (a+b+c+d+e)/24000				51.07	
					say	51.00	
	Note	1. Tack coat, if required to be provided, before laying slurry seal may be measured and paid separately					
5.16	517	Recycling of Bituminous Pavement with Central Recycling Plant					
		Recycling pavement by cold milling of existing bituminous layers, planning the surface after cold milling, reclaiming excavated material to the extent of 30 per cent of the required quantity, hauling and stock piling the reclaimed material near the central recycling plant after carrying out necessary checks and evaluation, adding fresh material including rejuvenators as required, mixing in a hot mix plant, transporting and laying at site and compacting to the required grade, level and thickness, all as specified in clause 517					
		Unit = cum					
		Taking output = 120 cum (276 tonnes)					
		a) Labour					
		Mate	day	0.480	582.53	279.61	L-12
		Mazdoor	day	10.000	529.57	5295.70	L-13
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		b) Machinery					
		Cold milling machine @ 20 cum per hour	hour	6.000	2257.56	13545.34	P&M-069
		Mechanical broom @ 1250 sqm per hour	hour	1.280	540.16	691.41	P&M-031
		Air compressor 250 cfm	hour	1.280	887.56	1136.08	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	0.910	1041.13	947.43	P&M-004
		Hot mix plant 100-120 TPH producing an average of 75 tonnes per hour	hour	3.000	18085.02	54255.07	P&M-021
		Electric generator set 250 KVA	hour	3.000	1433.02	4299.05	P&M-081
		Front end loader 1.00 cum bucket capacity	hour	3.000	930.98	2792.95	P&M-017
		Tipper 5.5 cum capacity	hour	18.000	1006.18	18111.29	P&M-048
		Smooth wheeled roller 8-10 tonnes	hour	3.00x0.65*	510.51	995.49	P&M-044
		Vibratory roller 8 tonnes	hour	3.00x0.65*	833.54	1625.41	P&M-059
		Smooth wheeled tandem roller 6-8 tonnes	hour	3.00x0.65*	761.52	1484.97	P&M-045
		c) Material					
		i) Bitumen					
		A bitumen content is 4.5 per cent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 per cent of normal requirement.					
		In a mix of 276 tonnes, 82.8 tonne is reclaimed and balance 193.2 tonne is fresh mix.					
		Bitumen required for reclaimed mix of 82.8 tonne @ 60 per cent = 82.8 x 0.60 x 0.04 = 1.99	tonne	1.987	41363.28	82197.11	M-074
		Bitumen required for fresh mix of 193.2 tonnes = 193.2 x 0.04 = 7.73	tonne	7.728	41363.28	319655.43	M-074
		ii) Aggregates					
		Percentage of mix requiring fresh aggregates - 70 per cent					
		Weight of fresh mix = 276 x 0.70 = 193.2 tonne					
		Weight of fresh aggregate in the mix = 193.2 x 0.96 = 185.47 tonne					
		Taking average density of 1.5 tonnes/cum, total volume of aggregate = 123.65 cum.					
		Size wise requirement of fresh aggregates					
		37.5 - 25 mm @ 23 per cent	cum	28.440	2563.12	72895.08	M-049
		25 - 10 mm @ 15 per cent	cum	18.550	2603.90	48302.26	M-046
		10 - 5 mm @ 20 per cent	cum	24.730	2394.19	59208.21	M-040
		Below 5 mm @ 40 per cent	cum	49.460	2424.48	119914.63	M-030
		Filler (cement) @ 2 per cent = 5.52 tonnes of 276 tonne	tonne	5.520	7169.28	39574.43	M-081
		d) Overhead charges @ 10% on (a+b+c)				84858.38	
		e) Contractor's profit @ 16% on (a+b+c+d)				149350.75	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Cost for 120 cum of DBM = a+b+c+d+e				1082792.94	
			Rate per cum = (a+b+c+d+e)/120				9023.27	
						say	9023.00	
		Note	Although the total rolling time is only 4 hours as per norms, all the three rollers have to be available at site for 3 hours each to match with the output of re-cycling plant. To cater for their idling time, these have been multiplied with a factor of 0.65.					
5.17	518		Fog Spray					
			Providing and applying low viscosity bitumen emulsion for sealing cracks less than 3 mm wide or incipient fretting or disintegration in an existing bituminous surfacing.					
			Unit = sqm					
			Taking output = 10500 sqm					
			a) Labour					
			Mate	day	0.120	582.53	69.90	L-12
			Mazdoor	day	3.000	529.57	1588.71	L-13
			b) Machinery					
			Mechanical broom @ 1250 sqm per hour	hour	6.000	540.16	3240.97	P&M-031
			Air compressor 250 cfm	hour	6.000	887.56	5325.35	P&M-001
			Bitumen emulsion pressure distributor @ 1750 sqm per hour	tonne	6.000	1041.13	6246.81	P&M-004
			c) Material					
			Bitumen emulsion @ 0.75 kg per sqm	tonne	7.880	64904.31	511445.92	M-077
			d) Overhead charges @ 10% on (a+b+c)				52791.77	
			e) Contractor's profit @ 16% on (a+b+c+d)				92913.51	
			Cost for 10500 sqm = a+b+c+d+e				673622.94	
			Rate per sqm = (a+b+c+d+e)/10500				64.15	
						say	64.00	
			1. In case it is decided by the engineer to blind the fog spray, the following may be added					
			a) Labour					
			Mate	day	0.160	582.53	93.20	L-12
			Mazdoor for pre-coating of grit	day	4.000	529.57	2118.28	L-13
			b) Material					
			Crushed stone grit 3 mm size @ 3.75 kg per sqm	cum	26.250	1846.08	48459.62	M-024
			Bitumen emulsion for pre-coating grit @ 2 per cent of grit, 39.38 x 0.02	tonne	0.790	64904.31	51274.40	M-077
							101945.50	
							9.71	
						say	9.70	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.18	519		Bituminous Cold Mix (Including Gravel Emulsion)					
			Providing, laying and rolling of bituminous cold mix on prepared base consisting of a mixture of unheated mineral aggregate and emulsified or cutback bitumen, including mixing in a plant of suitable type and capacity, transporting, laying, compacting and finishing to specified grades and levels.					
			Unit = cum					
			Taking output = 205 cum (450 tonne)					
		(i)	Using bitumen emulsion and 9.5 mm or 13.2 mm size aggregate					
			Composition of mix (450 tonne) is assumed to be as under:-					
			Bitumen Emulsion 8 per cent	By weight of total mix				
			Filler 2 per cent					
			Total aggregates 90 per cent					
			Proportion of aggregates					
			19 mm to 9.5 mm 25 per cent					
			9.5 mm to 6 mm 29 per cent					
			6 mm to 0.075 mm 36 per cent					
			a) Labour					
			Mate	day	0.840	582.53	489.32	L-12
			Mazdoor	day	16.000	529.57	8473.12	L-13
			Mazdoor skilled	day	5.000	688.44	3442.20	L-15
			b) Machinery					
			Drum mix plant for cold mixes of appropriate capacity but not less than 75 tonnes/hour.	hour	6.000	651.69	3910.13	P&M-077
			Electric generator 125 KVA	hour	6.000	709.62	4257.74	P&M-018
			Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
			Tipper 10 tonne capacity	tonne.km	450 x L	8.90	4003.48	Lead =10 km & P&M-058
			Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
			Paver finisher	hour	6.000	2718.81	16312.87	P&M-034
			Pneumatic tyred roller 12-15 tonnes	hour	6.00x0.65*	1262.49	4923.73	P&M-037
			Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	761.52	2969.93	P&M-045
			c) Material					
			Bitumen emulsion @ 8 per cent	tonne	36.000	64904.31	2336554.98	M-077
			Filler (lime) @ 2 per cent	tonne	9.000	13451.08	121059.68	M-188
			Aggregates size 19 to 9.5 mm - 450 x 0.25 x 1/1.5	cum	75.000	2609.72	195729.03	M-045
			Aggregates size 9.5 to 6 mm - 450 x 0.29 x 1/1.5	cum	87.000	2394.19	208294.14	M-040
			Aggregates size 6 to 0.075 mm - 450 x 0.36 x 1/1.5	cum	108.000	2424.48	261843.50	M-030
			d) Overhead charges @ 10% on (a+b+c)				321788.53	
			e) Contractor's profit @ 16% on (a+b+c+d)				566347.82	
			Cost for 205 cum = a+b+c+d+e				4106021.67	
			Rate per cum = (a+b+c+d+e)/205				20029.37	
						say	20029.00	
			(Applicable to cases I to IV)					
		Note	1. Density of aggregates has been assumed 1.5 gms/cc					
			2. Tack coat where provided will be measured and paid separately.					
			*3. Though the rollers are required only for 3.5 hours each as per norms of output, but these are required to be available at site for 6 hours as the drum mix plant and the paver would take 6 hours for mixing and paving. To cater for the idle period, their usage rates have been multiplied by a factor of 0.65					
5.18		(ii)	Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate					
			Composition of mix (450 tonne) is assumed to be as under:-					
			Bitumen Emulsion 8 per cent					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Filler 2 per cent					
		Total aggregates 90 per cent					
		Proportion of aggregates					
		37.5 mm to 19 mm 25 per cent					
		19 mm to 6 mm 30 per cent					
		6 mm to 0.075 mm 35 per cent					
		a) Labour					
		Mate	day	0.840	582.53	489.32	L-12
		Mazdoor	day	16.000	529.57	8473.12	L-13
		Mazdoor skilled	day	5.000	688.44	3442.20	L-15
		b) Machinery					
		Drum mix plant for cold mixes 60-90 tonne per hour producing average output of 75 tonnes per hour	hour	6.000	651.69	3910.13	P&M-077
		Electric generator 125 KVA	hour	6.000	709.62	4257.74	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
		Paver finisher	hour	6.000	2718.81	16312.87	P&M-034
		Pneumatic tired roller 12-15 tonnes	hour	6.00x0.65*	1262.49	4923.73	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	761.52	2969.93	P&M-045
		c) Material					
		Bitumen emulsion @ 8 per cent	tonne	36.000	64904.31	2336554.98	M-077
		Filler (lime) @ 2 per cent	tonne	9.000	13451.08	121059.68	M-188
		Aggregates size 37.5 to 19 mm - 450 x 0.25 x 1/1.5	cum	75.000	2568.94	192670.77	M-048
		Aggregates size 19 to 6 mm - 450 x 0.3 x 1/1.5	cum	90.000	2623.70	236133.10	M-047
		Aggregates size 6 to 0.075 mm - 450 x 0.35 x 1/1.5	cum	105.000	2424.48	254570.07	M-030
		d) Overhead charges @ 10% on (a+b+c)				323539.26	
		e) Contractor's profit @ 16% on (a+b+c+d)				569429.09	
		Cost for 205 cum = a+b+c+d+e				4128360.93	
		Rate per cum = (a+b+c+d+e)/205				20138.35	
					say	20138.00	
	Note	1. Density of aggregates has been assumed 1.5 gms/cc					
		2. Tack coat where provided will be measured and paid separately.					
		*3. Though the rollers are required only for 3.5 hours each as per norms of output, but these are required to be available at site for 6 hours as the drum mix plant and the paver would take 6 hours for mixing and paving. To cater for the idle period, their usage rates have been multiplied by a factor of 0.65					
5.18	(iii)	Using cutback bitumen and 9.5 mm or 13.2 mm nominal size aggregate					
		Composition of mix (450 tonne) is assumed to be as under:-					
		Cutback bitumen 5 per cent					
		Filler (lime) 2 per cent					
		Total aggregates 93 per cent					
		Proportion of aggregates					
		19 mm to 9.5 mm 26 per cent					
		9.5 mm to 6 mm 31 per cent					
		6 mm to 0.075 mm 36 per cent					
		a) Labour					
		Mate	day	0.840	582.53	489.32	L-12
		Mazdoor	day	16.000	529.57	8473.12	L-13
		Mazdoor skilled	day	5.000	688.44	3442.20	L-15
		b) Machinery					
		Drum mix plant for cold mixes 60-90 tonne per hour producing average output of 75 tonnes per hour	hour	6.000	651.69	3910.13	P&M-077
		Electric generator 125 KVA	hour	6.000	709.62	4257.74	P&M-018

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
		Paver finisher	hour	6.000	2718.81	16312.87	P&M-034
		Pneumatic tyred roller 12-15 tonnes	hour	6.00x0.65*	1262.49	4923.73	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	761.52	2969.93	P&M-045
		c) Material					
		Cutback bitumen @ 5 per cent	tonne	22.500	41771.81	939865.61	M-076
		Filler (lime)@ 2 per cent	tonne	9.000	13451.08	121059.68	M-188
		Aggregates size 19 to 9.5 mm - 450 x 0.26 x 1/1.5	cum	78.000	2609.72	203558.19	M-045
		Aggregates size 9.5 to 6 mm - 450 x 0.31 x 1/1.5	cum	93.000	2394.19	222659.25	M-040
		Aggregates size 6 to 0.075 mm - 450 x 0.36 x 1/1.5	cum	108.000	2424.48	261843.50	M-030
		d) Overhead charges @ 10% on (a+b+c)				184339.02	
		e) Contractor's profit @ 16% on (a+b+c+d)				324436.68	
		Cost for 205 cum = a+b+c+d+e				2352165.93	
		Rate per cum = (a+b+c+d+e)/205				11473.98	
					say	11474.00	
	Note	1. Density of aggregates has been assumed 1.5 gms/cc					
		2. Tack coat where provided will be measured and paid separately.					
		*3. Though the rollers are required only for 3.5 hours each as per norms of output, but these are required to be available at site for 6 hours as the drum mix plant and the paver would take 6 hours for mixing and paving. To cater for the idle period, their usage rates have been multiplied by a factor of 0.65					
5.18	(iv)	Using cutback bitumen and 19 mm or 26.5 mm nominal size aggregate					
		Composition of mix (450 tonne) is assumed to be as under:-					
		Cutback bitumen 5 per cent					
		Filler 2 per cent					
		Total aggregates 93 per cent					
		Proportion of aggregates					
		37.5 mm to 19 mm 25 per cent					
		19 mm to 6 mm 30 per cent					
		6 mm to 0.075 mm 38 per cent					
		a) Labour					
		Mate	day	0.840	582.53	489.32	L-12
		Mazdoor	day	16.000	529.57	8473.12	L-13
		Mazdoor skilled	day	5.000	688.44	3442.20	L-15
		b) Machinery					
		Drum mix plant for cold mixes 60-90 tonne per hour producing output of 75 tonnes per hour	hour	6.000	651.69	3910.13	P&M-077
		Electric generator 125 KVA	hour	6.000	709.62	4257.74	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
		Paver finisher	hour	6.000	2718.81	16312.87	P&M-034
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1262.49	4923.73	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	761.52	2969.93	P&M-045
		c) Material					
		Cutback bitumen on @ 5 per cent	tonne	22.500	41771.81	939865.61	M-076
		Filler (lime)@ 2 per cent	tonne	9.000	13451.08	121059.68	M-188
		Aggregates size 37.5 to 19 mm - 450 x 0.25 x 1/1.5	cum	75.000	2568.94	192670.77	M-048
		Aggregates size 19 to 6 mm - 450 x 0.3 x 1/1.5	cum	90.000	2623.70	236133.10	M-047
		Aggregates size 6 to 0.075 mm - 450 x 0.38 x 1/1.5	cum	114.000	2424.48	276390.36	M-030

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 10% on (a+b+c)				186052.35	
		e) Contractor's profit @ 16% on (a+b+c+d)				327452.14	
		Cost for 205 cum = a+b+c+d+e				2374027.99	
		Rate per cum = (a+b+c+d+e)/205				11580.62	
					say	11581.00	
		Note 1. Density of aggregates has been assumed 1.5 gms/cc					
		2. Tack coat where provided will be measured and paid separately.					
		*3. Though the rollers are required only for 3.5 hours each as per norms of output, but these are required to be available at site for 6 hours as the drum mix plant and the paver would take 6 hours for mixing and paving. To cater for the idle period, their usage rates have been multiplied by a factor of 0.65					
5.19	520	Sand Asphalt Base Course					
		Providing, laying and rolling sand-asphalt base course composed of sand, mineral filler and bituminous binder on a prepared sub-grade or sub-base to the lines, levels, grades and cross sections as per the drawings including mixing in a plant of suitable type and capacity, transporting, laying, compacting and finishing.					
		Unit = cum					
		Taking output = 205 cum (450 tonne)					
		a) Labour					
		Mate	day	0.840	582.53	489.32	L-12
		Mazdoor	day	16.000	529.57	8473.12	L-13
		Mazdoor skilled	day	5.000	688.44	3442.20	L-15
		b) Machinery					
		Hot Mix Plant of appropriate capacity but not less than 75 tonnes/hour	hour	6.000	14468.02	86808.11	P&M-023
		Electric generator set 250 KVA	hour	6.000	1433.02	8598.10	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
		Paver finisher	hour	6.000	2718.81	16312.87	P&M-034
		smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65	510.51	1990.97	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65	833.54	3250.82	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem rollers.	hour	6.00x0.65	761.52	2969.93	P&M-045

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Material					
		Composition of mix (450 tonne) is assumed to be as under:-					
		Density 2.20 tonne per cum					
		Weight 450 tonne					
		Bitumen 5 per cent					
		Filler 2 per cent					
		Sand of size 4.75 to 0.075 mm 93 per cent					
		Bitumen @ 5 per cent	tonne	22.500	41363.28	930673.80	M-074
		Filler (lime) @ 2 per cent	tonne	9.000	13451.08	121059.68	M-188
		Sand of size 4.75 to 0.075 mm - 450 x 0.93 x 1/1.5	cum	288.620	6977.61	2013878.64	M-004
		d) Overhead charges @ 10% on (a+b+c)				324757.25	
		e) Contractor's profit @ 16% on (a+b+c+d)				571572.76	
		Cost for 205 cum = a+b+c+d+e				4143902.51	
		Rate per cum = (a+b+c+d+e)/205				20214.16	
					say	20214.00	
		Note 1. Tack coat will be measured and paid separately					
		2. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of this roller, their usage rates has been multiplied by a factor					
5.20	521	Modified Binder					
		Supply of modified binder produced by mixing bitumen with modifier such as natural rubber or crumb rubber or any other polymer found compatible with bitumen and which allows properties given in clause 521.3 and IRC:SP: 53 blending of modifier with bitumen to be done either at the refinery or at central unit with all facilities by proper industrial process is essential.					
		Unit = tonne					
		The use of modified binder is expected to result in an extended service life of bituminous pavements subject to heavy traffic loads in extreme climatic conditions, thus justifying the entire cost of adding modifiers/fibres. Other advantages include lower temperature susceptibility, higher resistance to aging, higher fatigue life, higher resistance to cracking and better adhesion between aggregates and binder					
		Detailed information and inductive dose level on the use of polymer modified binder is available in IRC : SP-53 / 2002. A number of proprietary products are now available in the market. For such proprietary products, test reports and cost effectiveness should be the basis for their selection in road works.					
		The modifier, in the required quantity shall be blended at the refinery or at central unit with all facilities by proper industrial process, is essential. If supplied in drums it shall be agitated in melted condition with suitable device for achieving homogeneity					
		Proposals to use glass fibre, polypropylene fibres or any other similar material in a bituminous mixture should be substantiated, complete with all details including test results, manufacturer's recommendations for addition or means of incorporating the fibres, homogeneously, without segregation into the mixture.					
		Before agreeing to the use of a fibre, it should have been proved to be satisfactory in use under circumstances, similar to the work, elsewhere or it would have under gone appropriate performance trials. Documented evidence of use and trials of the fibre, in any country having conditions similar to Indian will be acceptable.					
		where information on use of trials is inadequate or lacking, trials may be required to be under taken before agreeing to the use of the fibre.					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Note	1. The modified binder is usually manufactured by specialised firms as a proprietary product. The rate for this product is required to be ascertained from the market.					
			2. The specifications for various item of road works using polymer/rubber modified bitumens are same as those for penetration grade bitumen except those for any special conditions which the manufacturer may indicate					
			3. The other controls during mixing, laying shall be same as specified in IRC - 14, 29, 94 and 95 for open graded premix carpet, bituminous concrete, DBM and SDBC respectively					
			4. The temperature of mixing and rolling will be slightly higher than conventional bituminous mixes as indicated in Table 8 of IRC: SP: 53 - 2002					
5.21	522		Crack Prevention Courses					
		(i)	Stress absorbing membrane (SAM) crack width less than 6 mm					
			Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width below 6 mm after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 9 kg per 10 sqm and spreading 5.6 mm crushed stone aggregates @ 0.11 cum per 10 sqm with hydraulic chip spreader, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902					
			Unit = sqm					
			Taking output = 10500 sqm					
			a) Labour					
			Mate	day	0.240	582.53	139.81	L-12
			Mazdoor	day	6.000	529.57	3177.42	L-13
			b) Machinery					
			Mechanical broom @ 1250 sqm per hour	hour	6.000	540.16	3240.97	P&M-031
			Air compressor 250 cfm	hour	6.000	887.56	5325.35	P&M-001
			Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1041.13	6246.81	P&M-004
			Hydraulic Chip spreader	hour	6.000	2557.82	15346.94	P&M-025
			Smooth wheeled road roller 8-10 tonne	hour	6.000	510.51	3063.03	P&M-044
			c) Material					
			Modified binder	tonne	9.450	42023.21	397119.29	M-078
			Crushed stone aggregates 5.6 mm size	cum	105.000	2188.18	229759.19	M-050
			d) Overhead charges @ 10% on (a+b+c)				66341.88	
			e) Contractor's profit @ 16% on (a+b+c+d)				116761.71	
			Cost for 10500 sqm = a+b+c+d+e				846522.39	
			Rate per sqm = (a+b+c+d+e)/10500				80.62	
						say	81.00	
5.21		(ii)	Stress absorbing membrane (SAM) with crack width 6 mm to 9 mm					
			Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width 6 to 9 mm after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 11 kg per 10 sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 cum per 10 sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902					
			Unit = sqm					
			Taking output = 10500 sqm					
			a) Labour					
			Mate	day	0.240	582.53	139.81	L-12
			Mazdoor	day	6.000	529.57	3177.42	L-13
			b) Machinery					
			Mechanical broom @ 1250 sqm per hour	hour	6.000	540.16	3240.97	P&M-031
			Air compressor 250 cfm capacity	hour	6.000	887.56	5325.35	P&M-001
			Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1041.13	6246.81	P&M-004
			Hydraulic Chip spreader	hour	6.000	2557.82	15346.94	P&M-025
			Smooth wheeled road roller 8-10 tonne	hour	6.000	510.51	3063.03	P&M-044

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Material					
		Modified binder	tonne	11.550	42023.21	485368.02	M-078
		Crushed stone chipping 11.2 mm size	cum	105.000	2156.41	226422.90	M-051
		d) Overhead charges @ 10% on (a+b+c)				74833.12	
		e) Contractor's profit @ 16% on (a+b+c+d)				131706.30	
		Cost for 10500 sqm = a+b+c+d+e				954870.67	
		Rate per sqm = (a+b+c+d+e)/10500				90.94	
					say	91.00	
5.21		(iii) Stress absorbing membrane (SAM) crack width above 9 mm and cracked area above 50 per cent					
		Providing and laying a single coat of a stress absorbing membrane over a cracked road surface, with crack width above 9 mm and cracked area above 50 per cent after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 15 kg per 10 sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 cum per 10 sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902					
		Unit = sqm					
		Taking output = 10500 sqm					
		a) Labour					
		Mate	day	0.240	582.53	139.81	L-12
		Mazdoor	day	6.000	529.57	3177.42	L-13
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	540.16	3240.97	P&M-031
		Air compressor 250 cfm capacity	hour	6.000	887.56	5325.35	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1041.13	6246.81	P&M-004
		Hydraulic Chip spreader	hour	6.000	2557.82	15346.94	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	510.51	3063.03	P&M-044
		c) Material					
		Modified binder	tonne	15.750	42023.21	661865.48	M-078
		Crushed stone aggregates 11.2 mm size	cum	126.000	2156.41	271707.48	M-051
		d) Overhead charges @ 10% on (a+b+c)				97149.02	
		e) Contractor's profit @ 16% on (a+b+c+d)				170982.27	
		Cost for 10500 sqm = a+b+c+d+e				1239621.45	
		Rate per sqm = (a+b+c+d+e)/10500				118.06	
					say	118.00	
		Note In case 2nd coat is also required to be provided, material provided for the 2nd coat shall be as per table 500-47.					
5.21		(iv) Case - IV : Bitumen impregnated geotextile					
		Providing and laying a bitumen impregnated geotextile layer after cleaning the road surface, geotextile conforming to requirements of clause 703.3, laid over a tack coat with 1.05 kg per sqm of paving grade bitumen 80 - 100 penetration and constructed to the requirement of clause 703.4.5					
		Unit = sqm					
		Taking output = 3500 sqm					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.560	582.53	326.22	L-12
		Mazdoor	day	12.000	529.57	6354.84	L-13
		Mazdoor skilled	day	2.000	688.44	1376.88	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	2.800	540.16	1512.45	P&M-031
		Air compressor 250 cfm capacity	hour	2.800	887.56	2485.17	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	tonne	2.000	1041.13	2082.27	P&M-004
		Pneumatic roller	hour	2.000	1262.49	2524.99	P&M-037
		c) Material					
		Paving grade bitumen of 80 - 100 penetration @ 1.05 kg per sqm	tonne	3.680	41771.81	153720.24	M-075
		Geotextile including 10 per cent for overlaps	sqm	3850.000	102.23	393578.46	M-108
		d) Overhead charges @ 10% on (a+b+c)				56396.15	
		e) Contractor's profit @ 16% on (a+b+c+d)				99257.23	
		Cost for 10500 sqm = a+b+c+d+e				719614.89	
		Rate per sqm = (a+b+c+d+e)/3500				205.60	
					say	206.00	
		NOTE As bitumen overlay construction shall follow closely the fabric placement on the same day, an output of 3500 sqm only has been considered for the analysis which will cover a length of 500 m, of 7 m wide carriageway. This can be conveniently overlaid by a bitumenous course in a day					
5.22	519.3	Recipe Cold Mix					
		Providing and laying of premix of crushed stone aggregates and emulsion binder, mixed in a batch type cold mixing plant, laid over prepared surface, by paver finisher, rolled with a pneumatic tired roller initially and finished with a smooth steel wheel roller, all as per clause 519.3					
		Unit = cum					
		Taking output = 205 cum (450 tonnes)					
		(i) 75 mm thickness					
		a) Labour					
		Mate	day	1.000	582.53	582.53	L-12
		Mazdoor	day	12.000	529.57	6354.84	L-13
		Mazdoor skilled	day	5.000	688.44	3442.20	L-15
		b) Machinery					
		Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour	hour	6.000	3762.22	22573.34	P&M-064
		Electric generator 125 KVA	hour	6.000	709.62	4257.74	P&M-018
		Front end loader 1 cum capacity	hour	6.000	930.98	5585.90	P&M-017
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2718.81	16312.87	P&M-034
		Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
		Pneumatic tired roller 12-15 tonnes.	hour	6.00x0.65*	1262.49	4923.73	P&M-037
		Smooth wheeled steel roller 6-8 tonnes.	hour	6.00x0.65*	510.51	1990.97	P&M-044
		Water tanker 6 KL capacity	hour	1.000	819.77	819.77	P&M-060
		c) Material					
		Bitumen emulsion @ 45 litres per tonne	tonne	20.250	64904.31	1314312.18	M-077
		Crushed stone aggregates 40 mm nominal size	cum	297.000	2111.08	626989.99	M-055
		Cost of water	KL	6.000	529.57	3177.42	M-189
		d) Overhead charges @ 10% on (a+b+c)				205536.25	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Contractor's profit @ 16% on (a+b+c+d)				361743.80	
		Cost for 10500 sqm = a+b+c+d+e				2622642.58	
		Rate per sqm = (a+b+c+d+e)/205				12793.38	
					say	12793.00	
	Note	(Case I to III)					
		1. These mixes are considered suitable for minor repair work and temporary road surface improvement.					
		2. In case concrete mixtures are required to be used for mixing, a number of these will be needed to match the capacity of road rollers.					
		3. Tack coat, where provided, will be measured and paid separately.					
		*4. Both the rollers have to be available at site to match with the output of batch mixing plant and paver finisher. A multiplying factor of 0.65 has been adopted to cater for the idling period of road rollers.					
5.22	(ii)	40 mm thickness					
		a) Labour					
		Mate	day	1.000	582.53	582.53	L-12
		Mazdoor	day	12.000	529.57	6354.84	L-13
		Mazdoor skilled	day	5.000	688.44	3442.20	L-15
		b) Machinery					
		Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour	hour	6.000	3762.22	22573.34	P&M-064
		Electric generator 125 KVA	hour	6.000	709.62	4257.74	P&M-018
		Front end loader 1 cum capacity	hour	6.000	930.98	5585.90	P&M-017
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2718.81	16312.87	P&M-034
		Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1262.49	4923.73	P&M-037
		Smooth wheeled steel roller 6-8 tonnes.	hour	6.00x0.65*	510.51	1990.97	P&M-044
		Water tanker 6 KL capacity	hour	1.000	819.77	819.77	P&M-060
		c) Material					
		Bitumen emulsion @ 70 litres per tonne	tonne	31.500	64904.31	2044485.61	M-077
		Crushed stone aggregates 14 mm nominal size	cum	287.000	2360.40	677434.49	M-052
		Cost of water	KL	6.000	529.57	3177.42	M-189
		d) Overhead charges @ 10% on (a+b+c)				283598.05	
		e) Contractor's profit @ 16% on (a+b+c+d)				499132.56	
		Cost for 10500 sqm = a+b+c+d+e				3618711.06	
		Rate per sqm = (a+b+c+d+e)/205				17652.25	
					say	17652.00	
5.22	(iii)	25 mm thickness					
		a) Labour					
		Mate	day	1.000	582.53	582.53	L-12
		Mazdoor	day	12.000	529.57	6354.84	L-13
		Mazdoor skilled	day	5.000	688.44	3442.20	L-15
		b) Machinery					
		Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour	hour	6.000	3762.22	22573.34	P&M-064
		Electric generator 125 KVA	hour	6.000	709.62	4257.74	P&M-018
		Front end loader 1 cum capacity	hour	6.000	930.98	5585.90	P&M-017
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2718.81	16312.87	P&M-034
		Tipper 10 tonne capacity	tonne.km	450 x L	8.90	40035.48	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4003.55	
		Pneumatic tyred roller	hour	6.00x0.65*	1262.49	4923.73	P&M-037
		Smooth wheeled steel roller	hour	6.00x0.65*	510.51	1990.97	P&M-044

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Water tanker 6 KL capacity	hour	1.000	819.77	819.77	P&M-060
			c) Material					
			Bitumen emulsion @ 85 litres per tonne	tonne	38.250	64904.31	2482589.67	M-077
			Crushed stone aggregates 6 mm nominal size	cum	270.000	2407.00	649890.29	M-050
			Cost of water	KL	6.000	529.57	3177.42	M-189
			d) Overhead charges @ 10% on (a+b+c)				324654.03	
			e) Contractor's profit @ 16% on (a+b+c+d)				571391.09	
			Cost for 10500 sqm = a+b+c+d+e				4142585.43	
			Rate per sqm = (a+b+c+d+e)/205				20207.73	
						say	<u>20208.00</u>	

CHAPTER- 6								
CEMENT CONCRETE PAVEMENTS								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
6.1	601		Dry Lean Cement Concrete Sub- base					
			Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 150 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver with electronic sensor, compacting with 8-10 tonnes vibratory roller, finishing and curing.					
			Unit = cum					
			Taking output = 450 cum (990 tonne)					
			a) Labour					
			Mate	day	1.120	582.53	652.43	L-12
			Mazdoor skilled	day	6.000	688.44	4130.65	L-15
			Mazdoor	day	22.000	529.57	11650.54	L-13
			b) Machinery					
			Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
			Cement concrete batch mix plant @ 75 cum per hour	hour	6.000	2759.11	16554.67	P&M-068
			Electric generator 100 KVA	hour	6.000	1253.49	7520.95	P&M-080
			Paver with electronic sensor	hour	6.000	2718.81	16312.87	P&M-034
			Vibratory roller 8-10 t capacity	hour	8.000	833.54	6668.34	P&M-059
			Water tanker 6 KL capacity	hour	8.000	819.77	6558.19	P&M-060
			Tipper	tonne.km	990 x L	8.90	88078.06	Lead =10 km & P&M-058
			Add 10 per cent of cost of carriage to cover cost of loading and unloading				8807.81	
			c) Material					
			Crushed stone coarse aggregate of 25 mm and 12.5 mm nominal sizes graded as per table 600-1 @ 0.90 cum/cum of concrete conforming to clause 602.2.4.	cum	405.000	2479.00	1003995.00	M-052 and M-054
			Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete	cum	203.000	6977.61	1416455.42	M-004
			Cement @ 150 kg/cum of concrete	tonne	67.500	7169.28	483926.40	M-081
			Cost of water	KL	48.000	529.57	25419.35	M-189
			d) Overhead charges @ 10% on (a+b+c)				310231.66	
			e) Contractor's profit @ 16% on (a+b+c+d)				546007.72	
			Cost for 205 cum = a+b+c+d+e				3958555.97	
			Rate per cum = (a+b+c+d+e)/450				8796.79	
						say	8797.00	
		Note	Quantity provided for aggregate is for estimating purpose. Exact quantity shall be as per mix design.					
6.2	602		Cement Concrete Pavement					
			Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing.					
			Unit = cum					
			Taking output = 1050 cum (2415 tonne)					
			a) Labour					
			Mate	day	2.000	582.53	1165.05	L-12
			Mazdoor skilled	day	15.000	688.44	10326.61	L-15
			Mazdoor	day	35.000	529.57	18534.95	L-13
			b) Machinery					
			Road Sweeper @ 1250 sqm per hour	hour	2.800	540.16	1512.45	P&M-031
			Front end loader 1 cum bucket capacity	hour	18.000	930.98	16757.71	P&M-017

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cement concrete batch mix plant @ 175 cum per hour (effective output)	hour	6.000	3762.22	22573.34	P&M-067
		Electric generator 250 KVA	hour	6.000	1433.02	8598.10	P&M-081
		Slip form paver with electronic sensor	hour	6.000	3005.84	18035.03	P&M-006
		Water tanker 6 KL capacity	hour	36.000	819.77	29511.87	P&M-060
		Transit truck agitator 5 cum capacity.	tonne.km	2415xL	8.90	214857.10	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				21485.71	
		Concrete joint cutting machine .	hour	12.000	448.02	5376.19	P&M-083
		Texturing machine .	hour	12.000	1493.39	17920.65	P&M-088
		c) Material					
		Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.4. .	cum	945.000	2479.00	2342655.00	M-052 and M-054
		Sand as per IS: 383 and conforming to clause 602.2.4 @ 0.45 cum/cum of concrete	cum	473.000	6977.61	3300410.90	M-004
		Cement 43 grade @ 400 kg/cum of concrete	tonne	414.000	7169.28	2968081.92	M-081
		32 mm mild steel dowel bars of grade S 240	tonne	9.450	52915.23	500048.92	M-126
		16 mm deformed steel tie bars of grade S 415	tonne	1.170	52915.23	61910.82	M-082
		Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	3675.000	12.11	44489.43	M-164
		Pre moulded Joint filler, 25 mm thick for expansion joint.	sqm	16.330	503.07	8215.14	M-141
		Joint sealant	kg	875.000	742.50	649686.94	M-120
		Sealant primer	kg	116.670	577.05	67324.56	M-097
		Plastic sheath, 1.25 mm thick for dowel bars	sqm	46.670	67.26	3138.81	M-138
		Curing compound	liter	1850.000	77.68	143707.93	M-090
		Super plastisizer admixture IS marked as per 9103-1999 @ 0.5 per cent by weight of cement	kg	2070.000	376.63	779624.32	M-180
		Cost of water	KL	216.000	529.57	114387.10	M-189
		Add 1 per cent of material for cost of miscellaneous materials like tarpauline, Hessian cloth, metal cap, cotton / compressible sponge and cradle for dowel bars, work bridges for men to approach concrete surface without walking over it, cutting blades and bites, minor equipments like scabbling machine, threads, ropes, guide wires and any other unforeseen items.				109836.82	
		d) Overhead charges @ 10% on (a+b+c)				1148017.34	
		e) Contractor's profit @ 16% on (a+b+c+d)				2020510.51	
		Cost for 1050cum = a+b+c+d+e				14648701.20	
		Rate per cum = (a+b+c+d+e)/1050				13951.14	
					say	13951.00	
		Note					
		The quantities for cement, coarse aggregate and fine aggregates are for estimating only .The exact quantities will be as per mix design.					
6.3	603	Rolled Cement Concrete Base					
		Construction of rolled cement concrete base course with coarse and fine aggregate conforming to IS:383, the size of coarse aggregate not exceeding 25 mm with minimum, aggregate cement ratio 15:1 and minimum cement content of 200 kg/cum, aggregate gradation to be as per table 600-4 after blending, mixing in batching plant at optimum moisture content, transporting to site, laying with a paver with electronic sensor, compacting with 8-10 tonnes smooth wheeled vibratory roller to achieve, the designed flexural strength, finishing and curing.					
		Unit = cum					
		Taking output = 450 cum (990 tonne)					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	1.200	582.53	699.03	L-12
		Mazdoor skilled	day	7.000	688.44	4819.09	L-15
		Mazdoor	day	23.000	529.57	12180.11	L-13
		b) Machinery					
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Cement concrete batch mix plant @ 75 cum per hour	hour	6.000	2759.11	16554.67	P&M-068
		Electric generator 100 KVA	hour	6.000	1253.49	7520.95	P&M-080
		Paver with electronic sensor @ 75 cum/hr.	hour	6.000	2718.81	16312.87	P&M-034
		Vibratory roller 8-10 t capacity	hour	8.000	833.54	6668.34	P&M-059
		Water tanker with 5 km lead 6 KL capacity	hour	8.000	819.77	6558.19	P&M-060
		Tipper	tonne.km	990xL	8.90	88078.06	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				8807.81	
		c) Material					
		Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.3.	cum	405.000	2479.00	1003995.00	M-052 and M-054
		Sand as per IS: 383 and conforming to clause 602.2.3 @ 0.45 cum/cum of concrete	cum	203.000	6977.61	1416455.42	M-004
		Cement @ 200 kg/cum of concrete	tonne	90.000	7169.28	645235.20	M-081
		Cost of water	KL	48.000	529.57	25419.35	M-189
		d) Overhead charges @ 10% on (a+b+c)				326489.00	
		e) Contractor's profit @ 16% on (a+b+c+d)				574620.64	
		Cost for 450cum = a+b+c+d+e				4165999.65	
		Rate per cum = (a+b+c+d+e)/450				9257.78	
					say	9258.00	
	Note	The quantities for cement, coarse aggregate and fine aggregates are for estimating only .The exact quantities will be as per mix design.					
6.4	New	Transition Section between Rigid and Flexible Pavement					
		Due to change in the properties of materials and type of construction, a gradual changeover from rigid pavement to flexible pavement is desirable to avoid any damage at the butting joint. After provision of an expansion joint in the cement concrete slab, the thickness of slab should be tapered to 10 cm over a length of 3 m towards the flexible pavement. The deficiency of thickness caused due to tapering of the slab should be made up by the asphaltic layers.					
		The quantities of items should be worked out based on the approved design and drawings and priced as per rates given under respective clauses for cement concrete and asphaltic work.					
6.5	Suggestive	Construction of Base/Sub-Base of Pavement with Lean Concrete - Flyash.					
		Construction of Base/sub-base using cement, sand, fly ash and coarse aggregates proportioned as per table 4 of IRC: 74/1979 and with water content ratio, slump and compressive strength as defined in the said table, mix prepared in a batching and mixing plant and compacted with a vibratory roller 8-10 tonnes capacity within the time limit laid down vide clause 7.6.3 of IRC: 74-1979, construction joints properly formed at the end of day's work, cured for 14 days, all as specified in IRC: 74-1979 and as per approved plans.					
		Unit = cum					
		Taking output = 450 cum (990 tonne)					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	1.120	582.53	652.43	L-12
		Mazdoor skilled	day	6.000	688.44	4130.65	L-15
		Mazdoor	day	22.000	529.57	11650.54	L-13
		b) Machinery					
		Front end loader 1 cum bucket capacity	hour	6.000	930.98	5585.90	P&M-017
		Cement concrete batch mix plant @ 75 cum per hour	hour	6.000	2759.11	16554.67	P&M-068
		Electric generator 100 KVA	hour	6.000	1253.49	7520.95	P&M-080
		Paver finisher with electronic sensor	hour	6.000	2718.81	16312.87	P&M-034
		Vibratory roller 8-10 t capacity	hour	8.000	833.54	6668.34	P&M-059
		Water tanker 6 KL capacity	hour	8.000	819.77	6558.19	P&M-060
		Tipper 10 T Capacity	tonne.km	990 x L	8.90	88078.06	Lead =10 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				8807.81	
		c) Material					
		Crushed stone coarse aggregate of 40 mm nominal size @ 0.90 cum/cum of concrete conforming to table 2 of IRC: 74-1979.	cum	405.000	2111.08	854986.35	M-055
		Coarse Sand as per IS: 383 - 1970	cum	110.960	6977.61	774235.93	M-004
		Cement @ 150 kg/cum of concrete	tonne	67.500	7169.28	483926.40	M-081
		Fly ash conforming to IS: 3812 (Part II)	cum	91.540	1654.57	151459.45	M-011
		(Total fine aggregates = 450 x 0.45 = 202.50 cum To be divided in ratio of 2 sand : 1.65 flyash. Refer table 4 of IRC: 74-1979).					
		d) Overhead charges @ 10% on (a+b+c)				243712.86	
		e) Contractor's profit @ 16% on (a+b+c+d)				428934.63	
		Cost for 450 cum = a+b+c+d+e				3109776.03	
		Rate per cum = (a+b+c+d+e)/450				6910.61	
					say	<u>6911.00</u>	
	Note	1. Depending upon approved designs, crushed stone aggregates of nominal size 20mm can also be used as per gradation given in table 2 of IRC: 74-1979.					
		2. The ratio of specific gravities of fly ash and sand has been assumed to be 0.827.					
		3. The quantities of materials given in the analyses are for estimating purposes. Actual quantities shall be as per job mix formula.					
		4. Construction procedure as laid down in clause, of IRC: 74-1979 shall be followed.					
6.6	Suggestive	Cement - Flyash Concrete Pavement.					
		Construction reinforced-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, replacing cement by fly ash to the extent of 15 per cent and sand by 10 per cent, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per design.					
		Unit = cum					
		Taking output = 1050 cum (2415 tonne)					
		a) Labour					
		Mate	day	2.000	582.53	1165.05	L-12
		Mazdoor skilled	day	15.000	688.44	10326.61	L-15
		Mazdoor	day	35.000	529.57	18534.95	L-13
		b) Machinery					
		Road Sweeper @ 1250 sqm per hour	hour	2.800	540.16	1512.45	P&M-031
		Front end loader 1 cum bucket capacity	hour	18.000	930.98	16757.71	P&M-017

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cement concrete batch mix plant @ 175 cum per hour (effective output)	hour	6.000	3762.22	22573.34	P&M-067
		Electric generator 250 KVA	hour	6.000	1433.02	8598.10	P&M-081
		Slip form paver with electronic sensor	hour	6.000	3005.84	18035.03	P&M-006
		Water tanker 6 KL capacity	hour	36.000	819.77	29511.87	P&M-060
		Transit truck agitator 5 cum capacity.	tonne.km	2415xL	38.45	928489.60	P&M-050 Lead= 10 km
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				92848.96	
		Concrete joint cutting machine .	hour	12.000	448.02	5376.19	P&M-083
		Texturing machine .	hour	12.000	1493.39	17920.65	P&M-088
		c) Material					
		Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.4. .	cum	945.000	2479.00	2342655.00	M-052 and M-054
		Sand as per IS: 383 and conforming to clause 602.2.4	cum	425.000	6977.61	2965485.48	M-004
		Cement 43 grade	tonne	357.000	7169.28	2559432.96	M-081
		Fly ash conforming to IS: 3812-1966 (Part-I)	tonne	109.000	12281.20	1338651.06	M-011
		32 mm mild steel dowel bars of grade S 240	tonne	9.450	52915.23	500048.92	M-126
		16 mm deformed steel tie bars of grade S 415	tonne	1.170	52915.23	61910.82	M-082
		Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	3675.000	12.11	44489.43	M-164
		Pre moulded Joint filler, 25 mm thick for expansion joint.	sqm	16.330	503.07	8215.14	M-141
		Joint sealant	kg	875.000	1092.90	956287.38	M-120
		Sealant primer	kg	116.670	577.05	67324.56	M-097
		Plastic sheath, 1.25 mm thick for dowel bars	sqm	46.670	67.26	3138.81	M-138
		Curing compound	liter	1850.000	77.68	143707.93	M-090
		Super plastisizer admixture IS marked as per 9103-1999 @ 0.5 per cent by weight of cement	kg	2070.000	376.63	779624.32	M-180
		Cost of water	KL	216.000	529.57	114387.10	M-189
		Add 1 per cent of material for cost of miscellaneous materials like tarpauline, Hessian cloth, metal cap, cotton / compressible sponge and cradle for dowel bars, work bridges for men to approach concrete surface without walking over it, cutting blades and bites, minor equipments like scabbling machine, threads, ropes, guide wires and any other unforeseen items				95427.04	
		d) Overhead charges @ 10% on (a+b+c)				1315243.65	
		e) Contractor's profit @ 16% on (a+b+c+d)				2314828.82	
		Cost for 1050cum = a+b+c+d+e				16782508.92	
		Rate per cum = (a+b+c+d+e)/1050				15983.34	
					say	<u>15983.00</u>	
		Note					
		1.The quantities for cement, coarse aggregate and fine aggregates are for estimating only .The exact quantities will be as per mix design.					
		2.IRC: 68-1976 may be referred for guidelines on the design of cement-fly ash concrete for rigid pavement construction.					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			*Calculation of cement, sand and fly ash.					
			Cement @ 400 kg/cum = $1050 \times 400 = 420$ tonnes. 15 per cent of cement to be replaced by fly ash = 63 tonnes. Balance cement = 357 tonnes. Quantity of fly ash = $63 \times \text{specific gravity of fly ash} / \text{specific gravity of cement} = 63 \times 2.25 / 3.15 = 45$ tonnes.					
			Sand @ 0.45 cum / cum of concrete = $1050 \times 0.45 = 472.50$ x 1.6 = 756 tonnes. 10 per cent to be replaced by flyash. Balance sand = $756 \times 0.9 = 680.4$ tonnes = 680.4 / 1.6 = 425 cum. Quantity of flyash = $(756 - 680.4) \times \text{specific gravity of fly ash} / \text{specific gravity of sand} = 76.4 \times 2.25 / 2.687 = 63.97$ tonnes (say 64 tonnes)					
			Fly ash Total fly ash = $45 + 64 = 109$ tonnes.					

CHAPTER-7								
GEOSYNTHETICS AND REINFORCED EARTH								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
7.1	702		Sub-Surface Drain with Geotextiles					
			Construction of sub surface drain 200 mm dia using geotextiles treated with carbon black with physical properties as given in clause 702.2.3 formed in to a stable network and a planar geocomposite structure, joints wrapped with geotextile to prevent ingress of soil, all as per clause 702 and approved drawings including excavation					
			Unit = Running metre					
			Taking output = one metre					
			a) Labour					
			Mate	day	0.040	582.53	23.30	L-12
			Mazdoor skilled	day	0.250	688.44	172.11	L-15
			Mazdoor	day	0.500	529.57	264.78	L-13
			b) Material					
			Geonets, geomembrane and geotextile to make planar geocomposite stable network for sub surface drain including wrapping of joints with 160 mm over lapping with geotextile .					
			Geonets	sqm	1.000	100.88	100.88	M-107
			Geomembrane	sqm	1.000	94.16	94.16	M-106
			Geotextile	sqm	2.000	102.23	204.46	M-108
			Add 2 per cent cost of material for miscellaneous items like synthetic cord				7.99	
			c) Overhead charges @ 10% on (a+b)				86.77	
			d) Contractor's profit @ 16% on (a+b+c)				152.71	
			Rate per metre = a+b+c+d				1107.16	
						say	1107.00	
		Note	Surplus excavated material to be used at site. Hence seprate cost for disposal not added.					
7.2	702.4		Narrow Filter Sub-Surface Drain					
			Construction of a narrow filter sub- surface drain consisting of porous or perforated pipe laid in narrow trench surrounded by a geotextile filter fabric, with a minimum of 450 mm overlap of fabric and installed as per clause 702.3 and 309.3.5 including excavation and backfilling					
			Unit = Running metre length					
			Taking output = one metre					
			a) Labour					
			Mate	day	0.040	582.53	23.30	L-12
			Mazdoor skilled	day	0.250	688.44	172.11	L-15
			Mazdoor	day	0.500	529.57	264.78	L-13
			b) Material					
			Perforated geosynthetic pipe 150 mm dia	metre	1.000	351.48	351.48	M-134
			Geotextile filter fabric	sqm	1.250	107.61	134.51	M-109
			Add 2 per cent cost of material for miscellaneous item like synthetic cord				9.72	
			c) Overhead charges @ 10% on (a+b)				95.59	
			d) Contractor's profit @ 16% on (a+b+c)				168.24	
			Rate per metre = a+b+c+d				1219.73	
						say	1220.00	
		Note	Surplus excavated material to be used at site. Hence Separate cost for disposal not added.					
7.3	703		Laying Paving Fabric Beneath a Pavement Overlay					
			Providing and laying paving fabric with physical requirements as per table 704-2 over a tack coat of paving grade Bitumen 80-100 penetration, laid at the rate of 1 kg per sqm over thoroughly cleaned and repaired surface to provide a water resistant membrane and crack retarding layer. Paving fabric to be free of wrinkling and folding and to be laid before cooling of tack coat, brooming and rolling of surface with pneumatic roller to maximise paving fabric contact with pavement surface					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Unit = sqm					
		Taking output = 2800 sqm					
		a) Labour					
		Mate	day	0.800	582.53	466.02	L-12
		Mazdoor	day	20.000	529.57	10591.40	L-13
		b) Machinery					
		Road sweeper 1250 sqm per hour	hour	2.240	540.16	1209.96	P&M-031
		Pneumatic roller 14 tonnes 2000 sqm per hour	hour	1.400	1262.49	1767.49	P&M-037
		Bitumen pressure distributor 1750 sqm per hour	hour	1.680	1041.13	1749.11	P&M-004
		c) Material					
		Paving Fabric	sqm	2940.000	107.61	316369.29	M-133
		Paving Bitumen 80-100	tonne	2.800	41771.81	116961.05	M-075
		c) Overhead charges @ 10% on (a+b)				44911.43	
		d) Contractor's profit @ 16% on (a+b+c)				79044.12	
		Cost for 2800 sqm = a+b+c+d+e				573069.88	
		Rate per sqm = (a+b+c+d+e)/2800				204.67	
					say	205.00	
7.4	704	Laying Boulder Apron in Crates of Synthetic Geogrids					
		Providing, preparing and laying of geogrid crated apron 1 m x 5 m, 600 mm thick including excavation and backfilling with baffles at 1 metre interval, made with geogrids having characteristics as per clause 704.2, joining sides with connectors/ring staples, top corners to be tie tensioned, placing of suitable cross interval ties in layers of 300 mm connecting opposite side with lateral braces and tied with polymer braids to avoid bulging, constructed as per clause 704.3. filled with stone with minimum size of 200 mm and specific gravity not less than 2.65, packed with stone spalls, keyed to the foundation recess in case of sloping ground and laid over a layer of geotextile to prevent migration of fines, all as per clause 704 and laid as per clause 2503.3					
		Unit = cum					
		Taking output = 3.00 cum					
		a) Labour					
		Mate	day	0.060	582.53	34.95	L-12
		Mazdoor skilled	day	0.500	688.44	344.22	L-15
		Mazdoor	day	1.500	529.57	794.35	L-13
		b) Material					
		Geo grids	sqm	21.000	80.71	1694.84	M-105
		Connectors/ Staples	each	50.000	74.86	3742.76	M-085
		Polymer braids	metre	20.000	343.00	6860.05	M-140
		Stones with minimum size of 200 mm	cum	3.450	1081.65	3731.68	M-003
		Stones spall for filling voids	cum	0.450	1378.81	620.46	M-008
		c) Overhead charges @ 10% on (a+b)				1782.33	
		d) Contractor's profit @ 16% on (a+b+c)				3136.90	
		Cost for 3 cum = a+b+c+d				22742.55	
		Rate per cum = (a+b+c+d)/ 3				1749.43	
					say	1749.00	
7.5	3100	Reinforced Earth Structures					
		Reinforced earth Structures have four main components as under:					
		a) Excavation for foundation, foundation concrete and cement concrete grooved seating in the foundation for facing elements (facia material).					
		b) Facia material and its placement.					
		c) Assembling, joining with facing elements and laying of the reinforcing elements.					
		d) Earth fill with granular material which is to be retained by the wall.					
		Each component is analysed separately as under:					
		considering Average height of wall = 8 m.					
7.5	3102	(i) Assembling, joining and laying of reinforcing elements.					
		A With reinforcing element of steel / Aluminium strips / polymeric strips.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Unit = Running Metre					
		Taking Output = 450 m					
		a) Labour					
		Mate	day	0.360	582.53	209.71	L-12
		Mazdoor	day	6.000	529.57	3177.42	L-13
		Mazdoor skilled	day	3.000	688.44	2065.32	L-15
		b) Material					
		@ Reinforcement strips 60 mm wide 5 mm thick as per clause 3102.					
		1.Galvanised carbon steel strips	metre	450*1.1	228.67	113190.80	M-154
		or					
		2.Copper Strips	metre	450*1.1	470.79	233039.88	M-153
		or					
		3.Aluminium Strips	metre	450*1.1	532.66	263667.98	M-157
		or					
		4.Stainless steel strips	metre	450*1.1	538.04	266331.29	M-156
		or					
		5.Glass reinforced polymer/fibre reinforced polymer/polymeric strips	metre	450*1.1	495.00	245024.79	M-155
		@ Any one of the above alternative may be adopted as per approved design.					
		Add 10 per cent of the cost of reinforcing strip towards accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia pannels, overlaps, heat bonding or extension.					
	Type 1	1.Galvanised carbon steel strips					
		c) Overhead charges @ 10% on (a+b)				11864.33	
		d) Contractor's profit @ 16% on (a+b+c)				18982.92	
		Cost of 450 m = a+b+c+d				149490.50	
		Rate per metre =(a+b+c+d)/450				332.20	
					say	332.00	
	Type 2	2.Copper Strips					
		c) Overhead charges @ 10% on (a+b)				23849.23	
		d) Contractor's profit @ 16% on (a+b+c)				38158.77	
		Cost of 450 m = a+b+c+d				300500.34	
		Rate per metre =(a+b+c+d)/450				667.78	
					say	668.00	
	Type 3	3.Aluminium Strips					
		c) Overhead charges @ 10% on (a+b)				26912.04	
		d) Contractor's profit @ 16% on (a+b+c)				43059.27	
		Cost of 450 m = a+b+c+d				339091.74	
		Rate per metre =(a+b+c+d)/450				753.54	
					say	754.00	
	Type 4	4.Stainless steel strips					
		c) Overhead charges @ 10% on (a+b)				27178.37	
		d) Contractor's profit @ 16% on (a+b+c)				43485.40	
		Cost of 450 m = a+b+c+d				342447.51	
		Rate per metre =(a+b+c+d)/450				760.99	
					say	761.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Type 5	5. Glass reinforced polymer/fibre reinforced polymer/polymeric strips					
			c) Overhead charges @ 10% on (a+b)				25047.72	
			d) Contractor's profit @ 16% on (a+b+c)				40076.36	
			Cost of 450 m = a+b+c+d				315601.32	
			Rate per metre = (a+b+c+d)/450				701.34	
						say	<u>701.00</u>	
7.5(i)		B	With reinforcing elements of synthetic geogrids					
			Unit = sqm					
			Taking output = 300 sqm					
			a) Labour					
			Mate	day	0.360	582.53	209.71	L-12
			Mazdoor	day	6.000	529.57	3177.42	L-13
			Mazdoor skilled	day	3.000	688.44	2065.32	L-15
			b) Material					
			Synthetic Geogrids as per clause 3102.8 and approved design and specifications.	sqm	300.000	511.14	153342.26	M-181
			Add 10 per cent of the cost of reinforcing elements (synthetic geogrids) for accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia pannels, overlaps and other protective elements for synthetic geogrids.				15334.23	
			c) Overhead charges @ 10% on (a+b)				17412.89	
			d) Contractor's profit @ 16% on (a+b+c)				30646.69	
			Cost of 300 sqm of Synthetic geogrids = a+b+c+d				222188.52	
			Rate per sqm = (a+b+c+d)/ 300				740.63	
						say	<u>741.00</u>	
7.5	3104	(ii)	Facing elements of RCC					
			Unit = sqm					
			Taking output = 75 sqm					
			a) Labour					
			Mate	day	0.180	582.53	104.85	L-12
			Mazdoor	day	3.000	529.57	1588.71	L-13
			Mazdoor skilled	day	1.500	688.44	1032.66	L-15
			b) Machinery					
			Light crane with lifting capacity upto 3 tonne	hour	6.000	788.00	4728.00	P&M-013
			c) Material					
			Pre-cast RCC M-35 facing elements of size as per design and 18 cm thick for 75 sqm. (Refer Item 12.8 (H))	cu.m	13.500	8064.00	108864.00	Item 12.8 (H)
			HYSD steel @ 5 kg / sqm (Refer Item 12.6)	tonnes	0.380	88442.00	33607.96	Item 13.6
			Add 2 per cent of cost of fascia pannels, for all necessary temporary form work, scaffolding and provision of loops/lugs for lifting of pannels and joining the reinforcing elements.				2849.44	
			d) Overhead charges @ 10% on (a+b)				745.42	
			e) Contractor's profit @ 16% on (a+b+d)				1311.94	
			Cost for 75 sqm = a+b+c+d+e				154832.99	
			Rate per sqm = (a+b+c+d+e)/ 75				2064.44	
						say	<u>2064.00</u>	
		Note	1.The specification and construction details to be adopted shall be as per section 3100 of MoRTH Specification.					
			2.Drainage arrangement shall be made as per approved design and drawings.					
			3.The quantity of filler media shall be calculated as per approved design and specifications and shall be priced separately.The rate for same to be adopted from chapter 15.					
			4.Excavation for foundation including foundation concrete and groove in the foundation for seating of bottom most fascia panel and capping beam to be calculated as per design and priced separately. The rates for excavation and foundation concrete shall be taken from the chapter 12 & 13 in bridge section.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		5. The earth fill to be retained is not included in this analysis. The same is to be worked out and provided separately complete as per clause 305.					
		6. For compaction of Earthwork, attention is invited to clause 3105.5 of MoRTH Specification.					
		7. Length of reinforcing strips will vary with the height of wall and will be as per approved design and drawings.					
		8. The type of reinforcing elements to be adopted shall be as per approved design and specifications.					
		9. The market rate for supply of reinforcing elements and their accessories are to be ascertained from reputed firms in the field of earth reinforcement.					
		10. The earth fill material shall be clean, free draining, granular with high friction and low cohesion, non-corrosive, coarse grained with not 10 per cent of particles passing 75 micron sieve, free of any deleterious matter, chlorides, salts, acids, alkalies, mineral oil, fungus and microbes and shall be of specified PH value.					
		11. Capping beam is to be priced separately as per approved design. The rate for cement concrete shall be taken from the chapter of sub-structure in bridge section.					
		12. The cost of reinforced earth retaining wall shall include following:					
		(i) Excavation for foundation including backfilling.					
		(ii) Foundation concrete as per approved design.					
		(iii) Cost of facial pannels and their erection .					
		(iv) Cost of reinforcing elements including their fixing and joining with the facial pannels.					
		(v) Drainage arrangement including filter media as per approved design and drawings.					
		13. The compacted earth filling to be retained shall form part of embankment.					

CHAPTER-8								
TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.1	408		Cast in Situ Cement Concrete M20 Kerb					
			Construction of cement concrete kerb with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M-10 grade foundation 150 mm thick, foundation having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408					
			Unit = Running metre					
			Taking output = 360 metre					
		A.	Using Concrete Mixer					
			Cement Concrete					
			Cement concrete of grade M20 = 12.60 cum					
			Cement concrete of grade M10 for base = 11.61 cum					
			Total Concrete = 24.21 cu.m					
			a) Labour					
			Mate	day	0.720	582.53	419.42	L-12
			Mason	day	2.000	635.48	1270.97	L-11
			Mazdoor	day	16.000	529.57	8473.12	L-13
			b) Machinery					
			Kerb casting machine @ 60 metres/hour	hour	6.000	301.85	1811.13	P&M-029
			Concrete mixer 0.48/0.28 cum capacity	hour	12.000	375.99	4511.94	P&M-009
			Water tanker 6 KL capacity	hour	5.000	819.77	4098.87	P&M-060
			c) Material					
			Crushed stone aggregate 20 mm nominal size 59 per cent	cum	21.790	2372.47	51696.19	M-053
			Coarse sand 30 per cent	cum	10.900	7753.27	84510.66	M-005
			Cement 11 per cent	tonne	5.700	7169.28	40864.90	M-081
			Cost of water	KL	30.000	529.57	15887.10	M-189
			d) Overhead charges @ 10% on (a+b+c)				21354.43	
			e) Contractor's profit @ 16% on (a+b+c+d)				37583.79	
			Cost for 360 meter = a+b+c+d+e				272482.51	
			Rate per metre = (a+b+c+d+e)/360				756.90	
						say	757.00	
		B	Using Concrete Batching and Mixing Plant					
			Cement Concrete					
			Cement concrete of grade M20 = 12.60 cum					
			Cement concrete of grade M10 for base = 11.61 cum					
			Total Concrete = 24.21 cu.m					
			a) Labour					
			Mate	day	0.120	582.53	69.90	L-12
			Mason	day	1.000	635.48	635.48	L-11
			Mazdoor	day	2.000	529.57	1059.14	L-13
			b) Machinery					
			Kerb casting machine @ 60 metres/hour	hour	6.000	301.85	1811.13	P&M-029
			Concrete batching and mixing plant @ 15 cum/hr.	hour	1.600	1805.83	2889.33	P&M-003
			Water tanker 6 KL capacity	hour	5.000	819.77	4098.87	P&M-060
			Tipper 5.5 cum capacity	hour	6.000	1006.18	6037.10	P&M-048
			c) Material					
			Crushed stone aggregate 20 mm nominal size 59 per cent	cum	21.790	2609.72	56865.81	M-053
			Coarse sand 30 per cent	cum	10.900	6977.61	76055.98	M-004
			Cement 11 per cent	tonne	5.700	7169.28	40864.90	M-081
			Cost of water	KL	30.000	529.57	15887.10	M-189
			d) Overhead charges @ 10% on (a+b+c)				20627.47	
			e) Contractor's profit @ 16% on (a+b+c+d)				36304.35	
			Cost for 360 meter = a+b+c+d+e				263206.57	
			Rate per metre = (a+b+c+d+e)/360				731.13	
						say	731.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.2	408	Cast in Situ Cement Concrete M 20 Kerb with Channel					
		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					
	A	Using Concrete Mixer					
		<i>Unit = Running metre</i>					
		<i>Taking output = 300 metre length</i>					
		Cement Concrete					
		Cement concrete of grade M20= 17.48 cum					
		Cement concrete of grade M10 for base = 23.18 cum					
		Total Concrete = 40.66 cum					
		a) Labour					
		Mate	day	0.720	582.53	419.42	L-12
		Mason	day	2.000	635.48	1270.97	L-11
		Mazdoor	day	16.000	529.57	8473.12	L-13
		b) Machinery					
		Kerb casting machine @ 50 metres/hour for laying kerb and channel	hour	6.000	301.85	1811.13	P&M-029
		Concrete mixer 0.48/0.28	hour	16.000	375.99	6015.91	P&M-009
		Water tanker 6 KL capacity	hour	6.000	819.77	4918.65	P&M-060
		c) Material					
		Crushed stone aggregate 20 mm nominal size 60 per cent	cum	36.590	2372.47	86808.79	M-053
		Coarse sand 30 per cent	cum	18.300	6977.61	127690.32	M-005
		Cement 10 per cent	tonne	9.010	7169.28	64595.21	M-081
		Cost of water	KL	36.000	529.57	19064.52	M-189
		d) Overhead charges @ 10% on (a+b+c)				32106.80	
		e) Contractor's profit @ 16% on (a+b+c+d)				56507.97	
		Cost for 360 meter = a+b+c+d+e				409682.81	
		Rate per metre = (a+b+c+d+e)/300				1365.61	
					say	1366.00	
8.2	B	Using Concrete Batching and Mixing Plant					
		<i>Unit = Running metre</i>					
		<i>Taking output = 300 metre length</i>					
		Cement Concrete					
		Cement concrete of grade M20= 17.48 cum					
		Cement concrete of grade M10 for base = 23.18 cum					
		Total Concrete = 40.66 cum					
		a) Labour					
		Mate	day	0.120	582.53	69.90	L-12
		Mason	day	1.000	635.48	635.48	L-11
		Mazdoor	day	2.000	529.57	1059.14	L-13
		b) Machinery					
		Kerb casting machine @ 50 metres/hour for laying kerb and channel	hour	6.000	301.85	1811.13	P&M-029
		Concrete batching and mixing plant @ 15 cum/hr.	hour	2.700	1805.83	4875.75	P&M-003
		Water tanker 6 KL capacity	hour	6.000	819.77	4918.65	P&M-060
		Tipper of 5.5 cum capacity	hour	6.000	1006.18	6037.10	P&M-048
		c) Material					
		Crushed stone aggregate 20 mm nominal size 60 per cent	cum	36.590	2609.72	95489.67	M-053
		Coarse sand 30 per cent	cum	18.300	1297.45	23743.27	M-004
		Cement 10 per cent	tonne	9.010	7169.28	64595.21	M-081
		Cost of water	KL	36.000	529.57	19064.52	M-189
		d) Overhead charges @ 10% on (a+b+c)				22229.98	
		e) Contractor's profit @ 16% on (a+b+c+d)				39124.77	
		Cost for 300 meter = a+b+c+d+e				283654.56	
		Rate per metre = (a+b+c+d+e)/300				945.52	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
						say	<u>946.00</u>	
8.3	801		Printing New Letter and Figures of any Shade					
			Printing new letter and figures of any shade with synthetic enamel paint black or any other approved colour to give an even shade					
		(i)	Hindi (Matras commas and the like not to be measured and paid for Half letter shall be counted as half)					
			Details for 100 letters of 16 cm height i.e. 1600 cm					
			Unit = per cm height per letter					
			a) Labour					
			Mate	day	0.120	582.53	69.90	L-12
			Painter	day	2.000	635.48	1270.97	L-18
			Mazdoor	day	1.000	529.57	529.57	L-13
			b) Material					
			Paint	Litre	0.700	538.04	376.63	M-131
			c) Overhead charges @ 10% on (a+b)				224.71	
			d) Contractor's profit @ 16% on (a+b+c)				395.48	
			Cost for 1600 cm = a+b+c+d				2867.26	
			Rate per cm height per letter = (a+b+c+ d)/1600				1.79	
						say	<u>1.80</u>	
8.3		(ii)	English and Roman					
			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					
			a) Labour					
			Mate	day	0.070	582.53	40.78	L-12
			Painter Ist class	day	1.250	635.48	794.35	L-18
			Mazdoor	day	0.500	529.57	264.78	L-13
			b) Material					
			Paint	Litre	0.500	538.04	269.02	M-131
			c) Overhead charges @ 10% on (a+b)				136.89	
			d) Contractor's profit @ 16% on (a+b+c)				240.93	
			Cost for 1600 cm = a+b+c+d				1746.77	
			Rate per cm height per letter = (a+b+c +d)/1600				1.09	
						say	<u>1.10</u>	
8.4	801		Retro-Reflectorised Traffic Signs					
			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					
			Unit = Each					
			Taking output = one traffic sign					
			i) Excavation for foundation	cum	0.216	564.00	121.82	Item No. 3.13
			ii) Cement concrete M15 grade	cum	0.120	12200.00	1464.00	Item 12.8 (A)
			iii) Painting angle iron post two coats	sqm	0.430	228.70	98.34	Item 8.9

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour (For fixing at site)					
		Mate	day	0.010	582.53	5.83	L-12
		Mazdoor	day	0.250	529.57	132.39	L-13
		b) Material					
		Mild steel angle iron 75 x 75 x 6 mm	kg	19.000	60.67	1152.68	M-179 /1000
		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.					
		(i) 90 cm equilateral triangle	sqm	0.350	7129.07	2495.17	M-061
		or					
		(ii) 60 cm equilateral triangle	sqm	0.156	7129.07	1112.13	M-061
		or					
		(iii) 60 cm circular	sqm	0.283	7129.07	2017.53	M-061
		or					
		(iv) 80 mm x 60 mm rectangular	sqm	0.480	7129.07	3421.95	M-061
		or					
		(v) 60 cm x 45 cm rectangular	sqm	0.270	7129.07	1924.85	M-061
		or					
		(vi) 60 cm x 60 cm square	sqm	0.360	7129.07	2566.47	M-061
		or					
		(vii) 90 cm high octagon	sqm	0.672	7129.07	4790.73	M-061
		c) Machinery					
		Tractor-trolley	hour	0.010	357.99	3.58	P&M-053
		(i) 90 cm equilateral triangle					
		d) Overhead charges @ 10% on (a+b+c)				378.96	
		e) Contractor's profit @ 16% on (a+b+c+d)				666.98	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)				6519.76	
					say	6520.00	
		(ii) 60 cm equilateral triangle					
		d) Overhead charges @ 10% on (a+b+c)				240.66	
		e) Contractor's profit @ 16% on (a+b+c+d)				423.56	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)				4755.00	
					say	4755.00	
		(iii) 60 cm circular					
		d) Overhead charges @ 10% on (a+b+c)				331.20	
		e) Contractor's profit @ 16% on (a+b+c+d)				582.91	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)				5910.28	
					say	5910.00	
		(iv) 80 mm x 60 mm rectangular					
		d) Overhead charges @ 10% on (a+b+c)				471.64	
		e) Contractor's profit @ 16% on (a+b+c+d)				830.09	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)				7702.33	
					say	7702.00	
		(v) 60 cm x 45 cm rectangular					
		d) Overhead charges @ 10% on (a+b+c)				321.93	
		e) Contractor's profit @ 16% on (a+b+c+d)				566.60	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)				5792.02	
					say	5792.00	
		(vi) 60 cm x 60 cm square					
		d) Overhead charges @ 10% on (a+b+c)				386.09	
		e) Contractor's profit @ 16% on (a+b+c+d)				679.53	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)				6610.72	
					say	6611.00	
		(vii) 90 cm high octagon					
		d) Overhead charges @ 10% on (a+b+c)				608.52	
		e) Contractor's profit @ 16% on (a+b+c+d)				1071.00	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)				9448.89	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
						say	<u>9449.00</u>	
		Note	1. Any one area of aluminium sheeting given at (i) to (vii) may be adopted as per site requirement and in accordance with IRC : 67					
			2. Rate for excavation, cement concrete M-15 and painting may be taken from respective chapters					
			3. The depth of foundation and quantity of cement concrete in the foundation are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.					
8.5	801		Direction and Place Identification Signs upto 0.9 sqm Size Board.					
			Providing and erecting direction and place identification retro-reflectors 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					
			Unit = sqm					
			Taking output = 0.9 sqm					
			i) Excavation for foundation	cum	0.216	564.00	121.82	Item No. 3.13
			ii) Cement concrete M15 grade	cum	0.120	12200.00	1464.00	Item 12.8 (A)
			iii) Painting angle iron post two coats	sqm	0.430	142.30	61.19	Item 8.9
			a) Labour (For fixing at site)					
			Mate	day	0.010	582.53	5.83	L-12
			Mazdoor	day	0.200	529.57	105.91	L-13
			b) Material					
			Mild steel angle iron 75 mm x 75 mm x 6 mm, 2.85 metres long	kg	19.000	60.67	1152.68	M-179 /1000
			Aluminium sheeting fixed with encapsulated lens type reflective sheeting of size 0.9 sqm	sqm	0.900	7129.07	6416.16	M-061
			Add 2 per cent of cost of materials for drilling holes, nuts, bolts, fabrication etc.					
			c) Machinery					
			Tractor-trolley	hour	0.020	357.99	7.16	P&M-053
			d) Overhead charges @ 10% on (a+b+c)				768.77	
			e) Contractor's profit @ 16% on (a+b+c+d)				1353.04	
			Cost for 0.9 sqm = I+ii+iii+ a+b+c+d+e				11456.57	
			Rate per sqm (for sign having area upto 0.9 sqm) = (I+ii+iii+a+b+c+d+e)/0.90				12729.52	
						say	<u>12730.00</u>	
		Note	i) Lettering and arrow marks on sign board to be provided separately as per actual requirement. Rates for these items have been analysed separately					
			ii) Rate for excavation, cement concrete M-15 and painting may be taken from respective chapters					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.6	801	Direction and Place Identification Signs with size more than 0.9 sqm size Board.					
		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					
		Unit = sqm					
		Taking output = 1.50 sqm					
		i) Excavation for foundation	cum	0.430	564.00	242.52	Item No. 3.13
		ii) Cement concrete M15 grade	cum	0.240	12200.00	2928.00	Item 12.8 (A)
		iii) Painting angle iron post 2 coats	sqm	0.860	142.30	122.38	Item 8.9
		a) Labour (For fixing at site)					
		Mate	day	0.010	582.53	5.83	L-12
		Mazdoor	day	0.300	529.57	158.87	L-13
		b) Material					
		Mild steel angle iron 75 mm x 75 mm x 6 mm, 2.85 metres long, 2 nos	kg	38.000	60.67	2305.35	M-179 /1000
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting	sqm	1.500	7129.07	10693.60	M-061
		Add 2 per cent of cost of materials for drilling holes, nuts, bolts, fabrication etc.					
		c) Machinery					
		Tractor-trolley	hour	0.020	357.99	7.16	P&M-053
		d) Overhead charges @ 10% on (a+b+c)				1300.61	
		e) Contractor's profit @ 16% on (a+b+c+d)				2315.43	
		Cost for 1.5 sqm = i+ii+iii+ a+b+c+d+e				20079.75	
		Rate per sqm (for sign having area more than 0.9 sqm) = (i+ii+iii+a+b+c+d+e)/1.50				22310.83	
					say	22311.00	
		Note					
		i) Lettering and arrow marks on sign board to be provided separately as per actual requirement. Rates for these items have been analysed separately					
		ii) Rate for excavation, cement concrete M-15 and painting may be taken from respective chapters					
8.7	802	Overhead Signs					
		Providing and erecting overhead signs with a corrosion resistant 2mm thick aluminium alloy sheet reflectorised with high intensity retro-reflective sheeting of encapsulated lense type with vertical and lateral clearance given in clause 802.2 and 802.3 and installed as per clause 802.7 over a designed support system of aluminium alloy or galvanised steel trestles and trusses of sections and type as per structural design requirements and approved plans					
		A Truss and Vertical Support					
		Unit = tonne					
		Taking output = 1 tonne					
		a) Labour					
		Mate	day	0.240	582.53	139.81	L-12
		Blacksmith	day	2.000	635.48	1270.97	L-02
		Mazdoor including for handling & fixing at site.	day	4.000	529.57	2118.28	L-13
		b) Material					
		Aluminium alloy/galvanised steel including 5 per cent wastage	tonne	1.050	67947.19	71344.54	M-060
		Add 1 per cent on cost of material for nuts, bolts and drilling and welding consumables				713.45	
		Add 15 per cent on cost of material for fabrication of trusses as per approved design				10808.70	
		c) Machinery					
		Crane 3 tonne capacity	hour	3.000	788.00	2364.00	P&M-013

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Truck	hour	0.500	1006.18	503.09	P&M-057
		d) Overhead charges @ 10% on (a+b+c)				8926.28	
		e) Contractor's profit @ 16% on (a+b+c+d)				15710.26	
		Rate per tonne = (a+b+c+d+e)				113899.38	
					say	113899.00	
8.7	B	Aluminium Alloy Plate for Over Head Sign					
		Unit = sqm					
		Taking output = 1 sqm					
		a) Labour					
		Mate	day	0.020	582.53	11.65	L-12
		Blacksmith	day	0.100	635.48	63.55	L-02
		Mazdoor	day	0.150	529.57	79.44	L-13
		b) Material					
		Aluminium alloy plate, 2 mm thick, fixed with high intensity grade sheeting vide clause 801.3	sqm	1.000	4290.89	4290.89	M-059
		Miscellaneous					
		Add 1 per cent of cost of labour for lifting arrangement, like ladders, pulleys, ropes etc				1.55	
		c) Overhead charges @ 10% on (a+b)				444.71	
		d) Contractor's profit @ 16% on (a+b+c)				782.68	
		Rate per sqm = (a+b+c+d)				5674.47	
					say	5674.00	
	Note	1. The cost of excavation and foundation concrete for fixing of vertical support system to be worked out separately as per the approved drawing/design and to be included in the estimate.					
		2. Lettering and arrow marks on sign board to be provided separately as per actual requirement. Rates for these items have been included separately in this chapter.					
8.8	803	Painting Two Coats on New Concrete Surfaces					
		Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces					
		Unit = sqm					
		Taking output = 40 sqm					
		a) Labour					
		Mate	day	0.120	582.53	69.90	L-12
		Painter	day	2.000	635.48	1270.97	L-18
		Mazdoor	day	1.000	529.57	529.57	L-13
		b) Material					
		Paint conforming to requirement of clause 803.3.	Litre	6.000	874.32	5245.92	M-132
		Add for scaffolding @ 1 per cent of labour cost where required				52.46	
		Add @ 5 per cent cost of labour and materials to prepare the surface by filling minute roughness on the surface and priming the surface before laying 2 coats of painting.				355.82	
		c) Overhead charges @ 10% on (a+b)				752.46	
		d) Contractor's profit @ 16% on (a+b+c)				1324.34	
		Cost for 40 sqm = a+b+c+d				9601.44	
		Rate per sqm = (a+b+c+d)/40				240.04	
					say	240.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.9	803	Painting on Steel Surfaces					
		Providing and applying two coats of ready mix paint of approved brand on steel surface after thorough cleaning of surface to give an even shade					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.030	582.53	17.48	L-12
		Painter	day	0.450	635.48	285.97	L-18
		Mazdoor	day	0.250	529.57	132.39	L-13
		b) Material					
		Paint ready mixed approved brand.	Litre	1.250	538.04	672.55	M-131
		Add @ 1 per cent on cost of material for scaffolding				6.73	
		Add @ 5 per cent cost of labour and materials to prepare the surface by filling minute roughness on the surface and priming the surface before laying 2 coats of painting.				55.42	
		c) Overhead charges @ 10% on (a+b)				117.05	
		d) Contractor's profit @ 16% on (a+b+c)				206.01	
		Cost for 10 sqm = a+b+c+d				1493.60	
		Rate per sqm = (a+b+c+d)/10				149.36	
					say	149.00	
8.10	803	Painting on Wood Surfaces					
		Providing and applying two coats of ready mix paint of approved brand on wood surface after thorough cleaning of surface to give an even shade					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.030	582.53	17.48	L-12
		Painter	day	0.500	635.48	317.74	L-18
		Mazdoor	day	0.200	529.57	105.91	L-13
		b) Material					
		Paint ready mixed of approved brand.	Litre	1.500	538.04	807.06	M-131
		Add @ 1 per cent on cost of material for scaffolding				8.07	
		Add @ 5 per cent cost of labour and materials to prepare the surface by filling minute roughness on the surface and priming the surface before laying 2 coats of painting.				62.41	
		c) Overhead charges @ 10% on (a+b)				131.87	
		d) Contractor's profit @ 16% on (a+b+c)				232.09	
		Cost for 10 sqm = a+b+c+d				1682.63	
		Rate per sqm = (a+b+c+d)/10				168.26	
					say	168.00	
8.11	803	Painting Lines, Dashes, Arrows etc on Roads in Two Coats on New Work					
		Painting lines, dashes, arrows etc on roads in two coats on new work with ready mixed road marking paint conforming to IS:164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control					
		(i) Over 10 cm in width					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.090	582.53	52.43	L-12
		Painter	day	0.550	635.48	349.52	L-18
		Mazdoor	day	1.550	529.57	820.83	L-13
		b) Material					
		Road marking Paint as per IS :164	Litre	1.480	874.32	1293.99	M-132
		c) Overhead charges @ 10% on (a+b)				251.68	
		d) Contractor's profit @ 16% on (a+b+c)				442.95	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Cost for 10 sqm = a+b+c+d				3211.40	
			Rate per sqm = (a+b+c+d)/10				321.14	
						say	<u>321.00</u>	
8.11		(ii)	Up to 10 cm in width					
			Unit = sqm					
			Taking output = 10 sqm					
			a) Labour					
			Mate	day	0.070	582.53	40.78	L-12
			Painter	day	0.350	635.48	222.42	L-18
			Mazdoor	day	1.350	529.57	714.92	L-13
			b) Material					
			Road marking paint	Litre	1.480	874.32	1293.99	M-132
			c) Overhead charges @ 10% on (a+b)				227.21	
			d) Contractor's profit @ 16% on (a+b+c)				399.89	
			Cost for 10 sqm = a+b+c+d				2899.21	
			Rate per sqm = (a+b+c+d)/10				289.92	
						say	<u>290.00</u>	
8.12	803		Painting Lines, Dashes, Arrows etc on Roads in Two Coats on Old Work					
			Painting lines, dashes, arrows etc on roads in two coats on old work with ready mixed road marking paint conforming to IS: 164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control					
		(i)	Over 10 cm in width					
			Unit = sqm					
			Taking output = 10 sqm					
			a) Labour					
			Mate	day	0.060	582.53	34.95	L-12
			Painter Ist class	day	0.300	635.48	190.65	L-18
			Mazdoor	day	1.250	529.57	661.96	L-13
			b) Material					
			Road marking paint	Litre	0.900	874.32	786.89	M-132
			c) Overhead charges @ 10% on (a+b)				167.44	
			d) Contractor's profit @ 16% on (a+b+c)				294.70	
			Cost for 10 sqm = a+b+c+d				2136.59	
			Rate per sqm = (a+b+c+d)/10				213.66	
						say	<u>214.00</u>	
8.12		(ii)	Up to 10 cm in width					
			Unit = sqm					
			Taking output = 10 sqm					
			a) Labour					
			Mate	day	0.070	582.53	40.78	L-12
			Painter Ist class	day	0.350	635.48	222.42	L-18
			Mazdoor	day	1.350	529.57	714.92	L-13
			b) Material					
			Road marking Paint	Litre	0.900	874.32	786.89	M-132
			c) Overhead charges @ 10% on (a+b)				176.50	
			d) Contractor's profit @ 16% on (a+b+c)				310.64	
			Cost for 10 sqm = a+b+c+d				2252.14	
			Rate per sqm = (a+b+c+d)/10				225.21	
						say	<u>225.00</u>	
8.13	803		Road Marking with Hot Applied Thermoplastic Compound with Reflectorisng Glass Beads on Bituminous Surface					
			Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorisng 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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Unit = sqm					
		Taking output = 600 sqm					
		a) Labour					
		Mate	day	0.030	582.53	17.48	L-12
		Mazdoor	day	0.750	529.57	397.18	L-13
		b) Machinery					
		Road marking machine @ 60 sqm per hour	hour	10.000	129.22	1292.15	P&M-043
		Tractor-trolley	hour	0.500	357.99	178.99	P&M-053
		c) Material					
		Hot applied thermoplastic compound	Litre	1500.000	1092.90	1639349.80	M-118
		Reflectorising glass beads	kg	150.000	464.06	69609.31	M-152
		d) Overhead charges @ 10% on (a+b+c)				171084.49	
		e) Contractor's profit @ 16% on (a+b+c+d)				301108.70	
		Cost for 600 sqm = a+b+c+d+e				2183038.11	
		Rate per sqm = a+b+c+d+e)/600				3638.40	
					say	3638.00	
		Note					
		1. A sealing primer may be applied in advance on cement concrete pavement to ensure proper bonding. Any laitance and/or curing compound to be removed where paint is required to be applied on concrete surface.					
		2. Cost of painter is already included in hire charges of road marking machine.					
8.14	804	Kilometre Stone					
		Reinforced cement concrete M15 grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and printing etc					
		(i) 5th kilometre stone (precast)					
		Unit = Nos.					
		Taking output = 6 Nos.					
		a) M-15 grade of concrete	cum	2.350	12200.00	28670.00	Item 12.8 (A)
		b) Steel reinforcement @ 5 kg per sqm	kg	22.080	88.44	1952.80	Item 13.6 /1000
		c) Excavation in soil for foundation	cum	1.680	564.00	947.52	Item No. 3.13
		d) Painting two coats on concrete surface	sqm	9.850	228.70	2252.70	Item 8.8
		e) Lettering on km post (average 30 letters of 10 cm height each)	per cm per letter	1800.000	1.10	1980.00	Item 8.3
		Transportation and fixing					
		f) Labour					
		Mate	day	0.260	582.53	151.46	L-12
		Mason	day	0.600	635.48	381.29	L-11
		Mazdoor including loading/unloading	day	6.000	529.57	3177.42	L-13
		g) Machinery					
		Tractor-trolley	hour	6.000	357.99	2147.94	P&M-053
		h) Overhead charges @ 10% on (f+g)				585.81	
		i) Contractor's profit @ 16% on (f+g+h)				1031.03	
		Cost for 6 Nos. 5th km stone = a+b+c+ d+e +f+g+h +i				43277.95	
		Rate for each 5th km stone = (a+b+c+ d+e +f+g+h +i) /6				7212.99	
					say	7213.00	
8.14		(ii) Ordinary kilometer stone (precast)					
		Unit = Nos.					
		Taking output = 14 Nos.					
		a) M-15 grade of concrete	cum	3.770	12200.00	45994.00	Item 12.8 (A)
		b) Steel reinforcement @ 5 kg per sqm	kg	26.320	88.44	2327.79	Item 13.6 /1000
		c) Excavation in soil for foundation	cum	2.770	564.00	1562.28	Item No. 3.13
		d) Painting two coats on concrete surface	sqm	11.410	228.70	2609.47	Item 8.8
		e) Lettering on km post (average 12 letters of 10 cm height each)	per cm per letter	1680.000	1.10	1848.00	Item 8.3

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Transportation and fixing					
			f) Labour					
			Mate	day	0.320	582.53	186.41	L-12
			Mason	day	1.000	635.48	635.48	L-11
			Mazdoor	day	7.000	529.57	3706.99	L-13
			g) Machinery					
			Tractor-trolley	hour	6.000	357.99	2147.94	P&M-053
			h) Overhead charges @ 10% on (f+g)				667.68	
			i) Contractor's profit @ 16% on (f+g+h)				1175.12	
			Cost for 14 Nos. ordinary km stone = (a+b+ c +d+e+f+g+h+i)				62861.16	
			Rate for each ordinary km stone = (a+b+ c +d+e+f+g+h+i) /14				4490.08	
						say	<u>4490.00</u>	
8.14		(iii)	Hectometer stone (precast)					
			Unit = Nos.					
			Taking output = 33 Nos.					
			a) M-15 grade of concrete	cum	1.580	12200.00	19276.00	Item 12.8 (A)
			b) Steel reinforcement @ 5 kg per sqm	kg	66.000	62.66	4135.36	Item 13.6 /1000
			c) Excavation in soil for foundation	cum	1.390	564.00	783.96	Item No. 3.13
			d) Painting two coats on concrete surface	sqm	6.270	228.70	1433.95	Item 8.8
			e) Lettering on km post (average 1 letter of 10 cm height each)	per cm per letter	330.000	1.10	363.00	Item 8.3
			Transportation and fixing					
			f) Labour					
			Mate	day	0.340	582.53	198.06	L-12
			Mason	day	1.500	635.48	953.23	L-11
			Mazdoor	day	7.000	529.57	3706.99	L-13
			g) Machinery					
			Tractor-trolley	hour	6.000	357.99	2147.94	P&M-053
			h) Overhead charges @ 10% on (f+g)				700.62	
			i) Contractor's profit @ 16% on (f+g+h)				1233.09	
			Cost for 33 Nos. Hectometer stone = (a+b +c +d+e+f+g+h+i)				34932.19	
			Rate for each Hectometer stone = (a+b +c +d+e+f+g+h+i) 33				1058.55	
						say	<u>1059.00</u>	
		Note	The rate for excavation, cement concrete, steel reinforcement, painting and lettering may be taken from respective chapters.					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.15	805		Road Delineators					
			Supplying and installation of delineators (road way indicators, hazard markers, object markers), 80-100 cm high above ground level, painted black and white in 15 cm wide strips, fitted with 80 x 100 mm rectangular or 75 mm dia circular reflectorised panels at the top, buried or pressed into the ground and conforming to IRC-79 and the drawings.					
			Unit = Each					
			Taking output= 30 Nos.					
			a) Labour					
			Mate	day	0.040	582.53	23.30	L-12
			Mazdoor for fixing	day	1.000	529.57	529.57	L-13
			b) Material					
			Cost of approved type of delineators from ISI certified firm as per the standard drawing given in IRC - 79	each	30.000	941.58	28247.26	M-091
			Add 10 per cent cost of material for installation				2824.73	
			c) Overhead charges @ 10% on (a+b)				3162.49	
			d) Contractor's profit @ 16% on (a+b+c)				5565.97	
			Cost for 30 Nos. delineators = (a+b+ c+d)				40353.31	
			Rate per delineators = (a+b+c+d) /30				1345.11	
						say	1345.00	
		Note	In case of soft ground, a proper foundation may be provided as per approved design. In case foundation is required to be provided, the items of excavation and foundation concrete are required to be measured and paid separately.					
8.16	806		Boundary pillar					
			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					
			Unit = Each					
			Taking output = 57 Nos.					
			a) M-15 grade of the boundary stone	cum	1.250	12200.00	15250.00	Item 12.8 (A)
			b) Steel reinforcement	kg	79.800	88.44	7057.67	Item 13.6 /1000
			c) Excavation in soil	cum	10.720	228.70	2451.66	Item No. 3.13
			d) Lettering, each 10 cm high	per letter per cm high	2280.000	1.10	2508.00	Item 8.3
			Transportation and fixing					
			e) Labour					
			Mate	day	0.570	582.53	332.04	L-12
			Mazdoor	day	14.250	529.57	7546.37	L-13
			f) Machinery					
			Tractor-trolley	hour	6.000	357.99	2147.94	P&M-053
			g) Material					
			Stone spall	cum	11.970	2947.06	35276.27	M-008
			h) Overhead charges @ 10% on (e+f+g)				4530.26	
			i) Contractor's profit @ 16% on (e+f+g+h)				7973.26	
			Cost for 57 Nos. boundary pillar = (a+b +c+d +e+ f+g+h+i)				85073.47	
			Rate for each boundary pillar = (a+b+c+d+e+ f+g+h+i)/57				1492.52	
						say	1493.00	
		Note	In case of soft ground, a proper foundation may be provided as per approved design. In case foundation is required to be provided, the items of excavation and foundation concrete are required to be measured and paid separately.					
8.17	807		G.I Barbed Wire Fencing 1.2 Metre High					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Providing and fixing 1.2 metres high GI barbed wire fencing with 1.8 m angle iron posts 40 mm x 40 mm x 6 mm placed every 3 metres center to center founded in M15 grade cement concrete, 0.6 metre below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 9 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per clause 807					
		Unit = per running metre					
		Taking output = 30 metres					
		a) Labour					
		Mate	day	0.090	582.53	52.43	L-12
		Blacksmith	day	0.250	635.48	158.87	L-02
		Mazdoor	day	2.000	529.57	1059.14	L-13
		b) Material					
		Barbed wire 335 metres length @ 9.38 kg per 100 metres	kg	31.420	336.28	10565.82	M-063
		MS angle iron 40 mm x 40mm x 6 mm, 23 metres in length @ 3.5 kg per metre	kg	80.500	60.67	4883.70	M-179 /1000
		Add for GI staple binding wire, drilling holes etc. @ 2 per cent of the cost of material				308.99	
		c) Painting					
		Applying two coats of painting on exposed surface of angle iron posts (Rate as per item no. 8.9)	sqm	2.110	228.70	482.56	Item 8.9
		d) Overhead charges @ 10% on (a+b)				1702.90	
		e) Contractor's profit @ 16% on (a+b+d)				2997.10	
		Cost for 30 metres fencing = a+b+c+d+e				22211.50	
		Rate per metre = (a+b+c+d+e)/30				740.38	
					say	740.00	
		Note					
		Cost of excavation for foundation and foundation concrete to be added separately in the cost estimate as per approved design. The rate for these items may be taken from respective chapters.					
8.18	807	G.I Barbed Wire Fencing 1.8 Metre High					
		Providing and fixing 1.8 metres high GI barbed wire fencing with 2.4 m angle iron posts 50 mm x 50 mm x 6 mm placed every 3 metres center to center founded in M15 grade cement concrete, 0.6 metre below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 12 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per clause 807					
		Unit = per running metre					
		Taking output = 30 metres					
		a) Labour					
		Mate	day	0.120	582.53	69.90	L-12
		Blacksmith	day	0.400	635.48	254.19	L-02
		Mazdoor	day	2.500	529.57	1323.92	L-13
		b) Material					
		Barbed wire 428 metres length @ 9.38 kg per 100 metres	kg	40.150	336.28	13501.52	M-063
		MS angle iron 50 mm x 50 mm x 6 mm, 33.8 metres in length @ 4.5 kg per metre	kg	152.000	60.67	9221.40	M-179 /1000
		Add for GI staple, binding wire, drilling holes etc. @ 2 per cent of the cost of material				454.46	
		c) Painting					
		Applying two coats of painting on exposed surface of angle iron posts	sqm	3.960	228.70	905.65	Item 8.9
		d) Overhead charges @ 10% on (a+b)				2482.54	
		e) Contractor's profit @ 16% on (a+b+d)				4369.27	
		Cost for 30 metres fencing = a+b+c+d+e				32582.86	
		Rate per metre fencing = (a+b+c +d+e)/30				1086.10	
					say	1086.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Note	Cost of excavation for foundation and foundation concrete to be added separately in the cost estimate as per approved design. The rate for these items may be taken from respective chapters.					
8.19	Suggestive		Fencing With Welded Steel Wire Fabric 75 mm x 50 mm					
			Providing 1.20 metre high fencing with angle iron posts 50 mm x 50 mm x 6 mm at 3 metre center to center with 0.40 metre embedded in M15 grade cement concrete, corner, end and every 10th post to be strutted, provided with welded steel wire fabric of 75 mm x 50 mm mesh or 75 mm x 25 mm mesh and fixed to iron posts by flat iron 50 x 5 mm and bolts etc. complete in all respects.					
			Unit = Running metre					
			Taking output = 30 m					
			a) Labour					
			Mate	day	0.120	582.53	69.90	L-12
			Welder	day	1.000	635.48	635.48	L-02
			Mazdoor	day	2.000	529.57	1059.14	L-13
			b) Material					
			i) Angle iron for posts 50 x 50 x 6 mm	kg	106.000	60.67	6430.72	M-179 /1000
			ii) Runner flat 50 x 5 mm	kg	26.000	60.67	1577.35	M-179 /1000
			iii) Welded steel wire fabric 75x50 mm mesh @ 4 kg/sqm, 4 x 30 x 1.2 + 5 per cent wastage	kg	151.000	100.88	15233.34	M-191
			OR					
			Welded steel wire fabric 75 x 25 mm mesh @ 7.75 kg/sqm, 7.75 x 30 x 1.2 + 5 per cent wastage	kg	293.000			
			Add 2.5 per cent of cost of material for drilling holes in angles, flats, splitting angle at bottom, nuts and bolts and welded consumables					
			c) Machinery					
			Tractor-trolley	hour	0.100	357.99	35.80	P&M-053
			d) Painting					
			Painting two coats including priming	sqm	8.000	228.70	1829.60	Item 8.9
			e) Overhead charges @ 10% on (a+b+c)				2504.17	
			f) Contractor's profit @ 16% on (a+b+c+e)				4407.34	
			Cost for 30 metre = a+b+c+d+e+f				33782.85	
			Rate per metre = (a+b+c+d+e+f)/30				1126.09	
						say	1126.00	
		Note	i) Adopt any one type of welded steel wire fabric 75 x 50 mm or 75 x 25 mm as per approved design.					
			ii) The item of excavation and cement concrete in foundation shall be measured and paid separately					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.20	808	Tubular Steel Railing on Medium Weight Steel Channel (ISMC series) 100 mm x 50 mm					
		Providing, fixing and erecting 50 mm dia steel pipe railing in 3 rows duly painted on medium weight steel channels (ISMC series) 100 mm x 50 mm, 1.2 metres high above ground, 2 m centre to centre, complete as per approved drawings					
		Unit = Running metre					
		Taking output = 10metres					
		i) Excavation for foundation (6 Nos) 6 x 0.6 x 0.6 x 0.6	cum	1.296	564.00	730.94	Item No. 3.13
		ii) Foundation concrete M-15 grade PCC 6 x 0.6 x 0.6 x 0.3	cum	0.648	12200.00	7905.60	Item 12.8 (A)
		iii) Painting of pipe	sqm	4.710	228.70	1077.18	Item 8.9
		iv) Painting of channel section 6 nos, 1.8 metres each 0.2 x 1.8 x 6 = 2.16	sqm	2.160	228.70	493.99	Item 8.9
		a) Labour (For fixing at site)					
		Mate	day	0.010	582.53	5.83	L-12
		Mazdoor	day	0.250	529.57	132.39	L-13
		Plumber	day	0.010	635.48	6.35	L-02
		b) Material					
		Steel pipe 50 mm external dia as per IS:1239	metre	30.000	181.59	5447.69	M-175
		Medium weight steel channel (ISMC series) 100 mm x 50 mm, 10.8 metres length @ 9.2 kg per metre	kg	99.360	60.67	6027.89	M-179 /1000
		Add for drilling holes @ 2 per cent of cost of channels				120.56	
		c) Machinery					
		Tractor-trolley	hour	0.040	357.99	14.32	P&M-053
		d) Overhead charges @ 10% on (a+b+c)				2194.84	
		e) Contractor's profit @ 16% on (a+b+c+d)				3862.92	
		Cost for 10 metre = i+ii+iii+iv+ a+b+c+d+e				28020.50	
		Rate per metre = (i+ii+iii+iv+a+b+c+d+e)/10				2802.05	
					say	2802.00	
8.21	808	Tubular Steel Railing on Precast RCC Posts, 1.2 m High Above Ground Level					
		Providing, fencing and erecting 50 mm dia painted steel pipe railing in 3 rows on precast M20 grade RCC vertical posts 1.8 metres high (1.2 m above GL) with 3 holes 50 mm dia for pipe, fixed 2 metres centre to, complete as per approved drawing					
		Unit = Running metre					
		Taking output = 10metres					
		i) Excavation for foundation (6 Nos) 6 x 0.6 x 0.6 x 0.6	cum	1.296	564.00	730.94	Item No. 3.13
		ii) Foundation concrete M - 15 grade PCC 6 x 0.6 x 0.6 x 0.3	cum	0.648	12200.00	7905.60	Item 12.8 (A)
		iii) RCC M - 20 for pre cast posts 6 nos of 1.8 metres each	cum	0.320	14694.50	4702.24	Item 14.1(A)
		iv) Painting of pipe	sqm	4.710	228.70	1077.18	Item 8.9
		a) Labour					
		Mate	day	0.014	582.53	8.16	L-12
		Mazdoor	day	0.350	529.57	185.35	L-13
		Plumber	day	0.010	635.48	6.35	L-02
		b) Material					
		Steel pipe 50 mm dia as per IS:1239	metre	30.000	181.59	5447.69	M-175
		c) Machinery					
		Tractor-trolley	hour	0.250	357.99	89.50	P&M-053
		d) Overhead charges @ 10% on (a+b+c)				573.70	
		e) Contractor's profit @ 16% on (a+b+c+d)				1009.72	
		Cost for 10 metre = i+ii+iii+iv+ a+b+c+d+e				21736.43	
		Rate per metre = (i+ii+iii+iv+a+b+c+d+e)/10				2173.64	
					say	2174.00	
8.22	809	Reinforced Cement Concrete Crash Barrier					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-20 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					
		Unit = Linear metre					
		Taking output = 10 m					
	(i)	a) M 20 grade concrete					
		M 20 grade concrete	cum	3.000	11506.00	34518.00	Item 14.1(A)
		b) Labour					
		Mate	day	0.040	582.53	23.30	L-12
		Mazdoor	day	1.000	529.57	529.57	L-13
		c) Material					
		HYSD steel reinforcement including dowel bars	tonne	0.280	52915.23	14816.26	M-082
		Pre-moulded asphalt filler board	sqm	0.320	804.37	257.40	M-144
		d) Overhead charges @ 10% on (b+c)				1562.65	
		e) Contractor's profit @ 16% on (b+c+d)				2750.27	
		Cost for 10 metre = a+b+c+d+e				54457.46	
		Rate per metre = (a+b+c+d+e)/10				5445.75	
					say	5446.00	
	Note	i) Excavation and backfilling are incidental to work and not to be measured separately.					
		ii) Rate for RCC M 20 may be taken from chapter on super structure.					
8.23	810	Metal Beam Crash Barrier					
	A	Type - A, "W" : Metal Beam Crash Barrier					
		Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fittings to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 810					
		Unit = Running metre					
		Taking output = 4.5 metre length					
		a) Labour					
		Mate	day	0.060	582.53	34.95	L-12
		Blacksmith	day	0.500	635.48	317.74	L-02
		Mazdoor	day	1.000	529.57	529.57	L-13
		b) Machinery					
		Tractor-trolley	hour	0.100	357.99	35.80	P&M-053
		c) Material					
		Corrugated sheet, 3 mm thick, "W" beam section railing, 4.5 m in length	kg	41.210	60.67	2500.09	M-179 /1000
		Channel post 150 x 75 x 5 mm, 1.8 m long, 3 Nos @ 16.4 kg per metre	kg	88.560	60.67	5372.68	M-179 /1000
		Spacer 150 x 75 x 5 mm channel 0.33 m long, 3 Nos @ 16.4 kg per metre	kg	16.240	60.67	985.23	M-179 /1000
		Nuts and bolts	kg	20.000	99.87	1997.48	M-130
		Add 25 per cent of the cost of material for fabrication, nuts, bolts and washers etc.)				2713.87	
		d) Overhead charges @ 10% on (a+b+c)				1448.74	
		e) Contractor's profit @ 16% on (a+b+c+d)				2549.79	
		Cost for 4.5 metre = a+b+c+d+e				18485.96	
		Rate per metre = (a+b+c+d+e)/4.5				4107.99	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
						say	4108.00	
8.23		B	Type - B, "THRIE" : Metal Beam Crash Barrier					
			Providing and erecting a "Thrie" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 85 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 2 m high with 1.15 m below ground level, all steel parts and fittings to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a space of channel section 150 x 75 x 5 mm, 546 mm long complete as per clause 810					
			Unit = Running metre					
			Taking output = 4.5 metre length					
			a) Labour					
			Mate	day	0.060	582.53	34.95	L-12
			Blacksmith	day	0.500	635.48	317.74	L-02
			Mazdoor	day	1.000	529.57	529.57	L-13
			b) Machinery					
			Tractor-trolley	hour	0.100	357.99	35.80	P&M-053
			c) Material					
			Corrugated sheet, 3 mm thick, "Thrie" beam section railing, 4.5 m in length	kg	72.940	80.71	5886.73	M-088
			Channel post 150 x 75 x 5 mm, 2 m long, 3 Nos @ 16.4 kg per metre	kg	98.400	60.67	5969.65	M-179 /1000
			Spacer 150 x 75 x 5 mm channel 0.546 m long, 3 Nos	kg	26.860	60.67	1629.52	M-179 /1000
			Nuts and bolts	kg	30.000	99.87	2996.23	M-130
			Add 15 per cent of the cost of material for fabrication, nuts, bolts and washers etc.)				2472.32	
			d) Overhead charges @ 10% on (a+b+c)				1987.25	
			e) Contractor's profit @ 16% on (a+b+c+d)				3497.56	
			Cost for 4.5 metre = a+b+c+d+e				25357.31	
			Rate per metre = (a+b+c+d+e)/4.5				5634.96	
						say	5635.00	
		Note	In the case of median crash barrier, "W" metal beam or thrie beam section should be provided on both sides of the vertical posts fixed in the median. Extra provision for metal beam railing and spacer is required to be made when fixed in the median depending on approved design.					
8.24	811		Road Traffic Signals electrically operated					
		Note	Since it is a ready made item commercially produced and erected by specialised firm in the electrical and electronic field, rate may be taken based on market enquiry from firms specialised in this field and ISI certified for the approved design and drawing.					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.25	Suggestive		Flexible Crash Barrier, Wire Rope Safety Barrier					
			Providing and erecting a wire rope safety barrier with vertical posts of medium weight RS Joist (ISMB series) 100 mm x 75 mm (11.50 kg/m), 1.50 m long 0.85 m above ground and 0.65 m below ground level, split at the bottom for better grip, embedded in M 15 grade cement concrete 450 x 450 x 450 mm, 1.50 m center to center and with 4 horizontal steel wire rope 40 mm dia and anchored at terminal posts 15 m apart. Terminal post to be embedded in M 15 grade cement concrete foundation 2400 x 450 x 900 mm (depth), strengthened by a strut of RS joist 100 x 75 mm, 2 m long at 450 inclination and a tie 100 x 8 mm, 1.50 m long at the bottom, all embedded in foundation concrete as per approved design and drawing, rate excluding excavation and cement concrete					
			Unit = Running metre					
			Taking output = 15 metre					
			a) Labour					
			Mate	day	0.120	582.53	69.90	L-12
			Mazdoor	day	2.000	529.57	1059.14	L-13
			Blacksmith	day	1.000	635.48	635.48	L-02
			b) Material					
			i) RS Joist 100 x 75 mm - 16.5 m @ 11.5 kg per metre	kg	190.000	60.67	11526.75	M-179 /1000
			ii) Struts - 2 Nos. for terminal posts, 2 m long each 2 x 2 x 11.50	kg	46.000	60.67	2790.69	M-179 /1000
			iii) Tie 2 Nos. of 8 mm steel plate, 1.5 sqm each for terminal posts @ 62.80 kg/sqm (2 x 1.5)	kg	188.400	60.67	11429.69	M-179 /1000
			iv) Steel wire rope 40 mm, including 7.50 per cent extra for fixing at ends 15 x 4 x 1.075 @ 1 kg per m	kg	65.000	416.98	27103.92	M-177
			Add 5 per cent of cost of material for drilling, gripping, fixing, fabrication and welding consumables				2642.55	
			c) Painting					
			Applying 2 coats of painting on exposed surface	sqm	16.500	228.70	3773.55	Item 8.9
			d) Machinery					
			Tractor-trolley	hour	0.250	357.99	89.50	P&M-053
			e) Overhead charges @ 10% on (a+b+d)				5734.76	
			f) Contractor's profit @ 16% on (a+b+d+e)				10093.18	
			Cost for 15 m = a+b+c+d+e+f				76949.12	
			Rate per m = (a+b+c+d+e+f)/15				5129.94	
						say	5130.00	
		Note	The items of excavations and cement concrete works will be measured and included separately as per the approved designs and drawings.					
8.26	Suggestive		Anti-Glare Devices in Median					
		A	Plantation					
			Plantation of shrubs and plants of approved species in the median. apart from cutting off glare from vehicle coming from opposite direction, these plants provide a pleasant environment and are eco-friendly. The rate for this item is available in the chapter 11 on horticulture.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		B Anti-glare screen with 25 mm steel pipe framework fixed with circular and rectangular vans					
		Providing and erecting an anti - glare screen with 25 mm dia vertical pipes fabricated and framed in the form of panels of one metre length and 1.75 metre height fixed with circular vane 250 mm dia at top and rectangular vane 600 x 300 mm at the middle, made out of steel sheet of 3 mm thickness, end vertical pipes of the panel made larger for embedding in foundation concrete, applying 2 coats of paint on all exposed surfaces, all as per approved design and drawings.					
		Unit = Running metre					
		Taking output = one metre					
		a) Labour					
		Mate	day	0.004	582.53	2.33	L-12
		Mazdoor	day	0.100	529.57	52.96	L-13
		b) Material					
		i) 25 mm steel pipe	metre	16.000	107.61	1721.74	M-174
		ii) MS sheet for 600 x 300 x 3 mm rectangular vane, one number @ 24kg/sqm	kg	4.320	60.67	262.08	M-179 /1000
		iii) MS sheet for 250 mm dia circular vane 3 mm thick, 4 numbers @ 24 kg/sqm	kg	4.800	60.67	291.20	M-179 /1000
		Add 5 per cent cost of material for fabrication, welding, bending, nuts, bolts etc				113.75	
		c) Painting					
		Applying 2 coats of painting on exposed surface	sqm	1.830	228.70	418.52	Item 8.9
		d) Overhead charges @ 10% on (a+b)				244.41	
		e) Contractor's profit @ 16% on (a+b+d)				430.15	
		Rate per metre = a+b+c+d+e				3537.14	
					say	3537.00	
		Note The items of excavation and cement concrete as per approved design to be measured and paid separately					
8.26		C Anti-glare screen with rectangular vane of MS sheet					
		Providing and erecting anti - glare screen with rectangular vanes of size 750 x 500 mm made from MS sheet, 3 mm thick and fixed on MS angle 50 x 50 x 6 mm at an angle of 45° to the direction of flow of traffic, 1.5 m center to center, top edge of the screen 1.75 m above ground level, vertical post firmly embedded in M-15 cement concrete foundation 0.60 m below ground level, applying 2 coats of paint on exposed faces, all complete as per approved design and drawings					
		Unit = Running metre					
		Taking output = 1.50 metre					
		a) Labour					
		Mate	day	0.004	582.53	2.33	L-12
		Mazdoor	day	0.100	529.57	52.96	L-13
		b) Material					
		i) Angle iron post, 50 x 50 x 6 mm, length 2.35 m	kg	10.580	60.67	641.86	M-179 /1000
		ii) MS sheet 3 mm thick @ 24 kg/sqm	kg	9.000	60.67	546.00	M-179 /1000
		Add 5 per cent of cost of material for fabrication, nuts, bolts etc				59.39	
		c) Machinery					
		Tractor-trolley	hour	0.100	357.99	35.80	P&M-053
		d) Painting					
		Applying 2 coats of painting	sqm	0.850	228.70	194.40	Item 8.9
		e) Overhead charges @ 10% on (a+b+c)				133.83	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			f) Contractor's profit @ 16% on (a+b+c+e)				235.55	
			Cost for 1.5 m = a+b+c+d+e+f				1902.12	
			Rate per metre = (a+b+c+d+e+f)/1.50				1268.08	
						say	1268.00	
		Note	The items of excavation and cement concrete as per approved design to be measured and paid separately. Rate of painting has been analysed separately in this chapter.					
8.27	Suggestive		Street Lighting					
			Providing and erecting street light mounted on a steel circular hollow pole of standard specifications for street lighting, 9 m high spaced 40 m apart, 1.8 m overhang on both sides if fixed in the median and on one side if fixed on the footpath, fitted with sodium vapour lamp and fixed firmly in concrete foundation.					
			Unit = Each					
			Taking output = one light					
			a) Labour					
			Mate	day	0.030	582.53	17.48	L-12
			Mazdoor	day	0.500	529.57	264.78	L-13
			Electrician	day	0.250	635.48	158.87	L-02
			b) Material					
			i) Steel circular hollow pole of standard specification for street lighting to mount light at 9 m height above road level	each	1.000	45733.66	45733.66	M-171
			ii) Sodium vapour lamp	each	1.000	4640.62	4640.62	M-168
			Add 5 per cent of cost of material for holder, electric cable, insulation, ladder, scaffolding etc				2518.71	
			c) Painting					
			For Fixing in Median					
			Providing two coats of alluminium paint over steel circular hollow pipe with overhang on both sides	sqm	5.750	228.70	1315.03	Item 8.9
			For fixing in Footpath					
			Providing two coats of alluminium paint over steel circular hollow pipe with overhang on one side	sqm	4.630	228.70	1058.88	Item 8.9
		(i)	For Fixing in Median					
			d) Overhead charges @ 10% on (a+b)				5333.41	
			e) Contractor's profit @ 16% on (a+b+d)				9386.81	
			Rate per light for fixing in Median= a+b+c+d+e				69369.37	
						say	69369.00	
		(ii)	For fixing in Footpath					
			Rate per light for Fixing in Footpath = a+b+c+d+e				69113.22	
						say	69113.00	
		Note	The items of excavation and cement concrete foundation will be measured and included separately in the estimate as per approved design and drawing. The rate for painting has been analysed in this chapter.					
8.28	Suggestive		Lighting on Bridges					
			Providing and fixing lighting on bridges, mounted on steel hollow circular poles of standard specifications, 5 m high fixed on parapets with cement concrete, 20 m apart and fitted with sodium vapour lamp					
			Unit = Each					
			Taking output = one light					
			a) Labour					
			Mate	day	0.020	582.53	11.65	L-12
			Mazdoor	day	0.400	529.57	211.83	L-13
			Electrician	day	0.200	635.48	127.10	L-02
			b) Material					
			i) Steel circular hollow pole of standard specification for street lighting to mount light at 5 m above deck level	each	1.000	23203.10	23203.10	M-170
			ii) Sodium vapour lamp 70 watt	each	1.000	4640.62	4640.62	M-168

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add 1 per cent of cost of material for holder, electric cable, insulation, ladder, scaffolding etc				278.44	
		c) Painting					
		Providing two coats of alluminium paint over steel circular hollow pipe	sqm	2.760	228.70	631.21	Item 8.9
		d) Overhead charges @ 10% on (a+b)				2847.27	
		e) Contractor's profit @ 16% on (a+b+d)				5011.20	
		Rate per light = a+b+c+d+e				36962.43	
					say	36962.00	
		Note The items of cement concrete to be measured and paid separately as per approved design. The rate for painting has already been analysed in this chapter.					
8.29	Suggestive	Cable Duct Across the Road					
		Providing and laying of a reinforced cement concrete pipe duct, 300 mm dia, across the road (new construction), extending from drain to drain in cuts and toe of slope to toe of slope in fills, constructing head walls at both ends, providing a minimum fill of granular material over top and sides of RCC pipe as per IRC:98-1997, bedded on a 0.3 m thick layer of granular material free of rock pieces, outer to outer distance of pipe at least half dia of pipe subject to minimum 450 mm in case of double and triple row ducts, joints to be made leak proof, invert level of duct to be above higher than ground level to prevent entry of water and dirt, all as per IRC: 98 - 1997 and approved drawings.					
		(i) Single row for one utility service					
		Unit = Running metre					
		Taking output = 20metres					
		a) Random Rubble masonry/Brick masonry in cement mortar 1:6 for head wall both side	cum	2.360	10040.00	23694.40	Item 12.7 (Addl) B)
		b) Labour					
		Mate	day	0.050	582.53	29.13	L-12
		Mazdoor	day	1.000	529.57	529.57	L-13
		Mazdoor skilled	day	0.250	688.44	172.11	L-15
		c) Material					
		Reinforced Cement Concrete pipe 300 mm dia	metre	20.000	7889.06	157781.11	M-151
		Granular soil with PI less than 6 for bedding and sides of pipe (0.6 x 0.6 x 20 m)	cum	7.200	1516.69	10920.17	M-009
		Collar for joints 300 mm dia	each	9.000	1136.95	10232.57	M-083
		Cement mortar 1:2 for joints	cum	0.020	11830.00	236.60	Item 12.6 (B)
		d) Machinery					
		Tractor-trolley	hour	0.500	357.99	178.99	P&M-053
		e) Overhead charges @ 10% on (b+c+d)				18008.03	
		f) Contractor's profit @ 16% on (b+c+d+e)				31694.12	
		Cost for 20 metre = a+b+c+d+e+f				253476.80	
		Rate per metre = (a+b+c+d+e+f)/20				12673.84	
					say	12674.00	
8.29		(ii) Double row for two utility services					
		Unit = Running metre					
		Taking output = 20metres					
		a) Random Rubble brick/Brick masonry in cement mortar 1:6 for head wall both sides.	cum	3.370	10040.00	33834.80	Item 12.7 (Addl) B)

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Labour					
		Mate	day	0.050	582.53	29.13	L-12
		Mazdoor	day	2.000	529.57	1059.14	L-13
		Mazdoor skilled	day	0.250	688.44	172.11	L-15
		c) Material					
		Reinforced Cement Concrete pipe 300 mm dia	metre	40.000	7889.06	315562.23	M-151
		Granular soil with PI less than 6 for bedding and sides of pipe (0.6 x 0.6 x 40 m)	cum	14.400	1516.69	21840.34	M-009
		Collar for joints 300 mm dia	each	18.000	1136.95	20465.14	M-083
		Cement mortar 1:2 for joints	cum	0.040	11830.00	473.20	Item 12.6 (B)
		d) Machinery					
		Tractor-trolley	hour	1.000	357.99	357.99	P&M-053
		e) Overhead charges @ 10% on (b+c+d)				35995.93	
		f) Contractor's profit @ 16% on (b+c+d+e)				63352.83	
		Cost for 20 metre = a+b+c+d+e+f				493142.83	
		Rate per metre = (a+b+c+d+e+f)/20				24657.14	
					say	24657.00	
8.29	(iii)	Triple rRow for three utility services					
		<i>Unit = Running metre</i>					
		Taking output = 20metres					
		a) Random Rubble brick/Brick masonry in cement mortar 1:6 for head wall both sides.	cum	4.380	10040.00	43975.20	Item 12.7 (Addl) B)
		b) Labour					
		Mate	day	0.160	582.53	93.20	L-12
		Mazdoor	day	3.000	529.57	1588.71	L-13
		Mazdoor skilled	day	1.000	688.44	688.44	L-15
		c) Material					
		Reinforced Cement Concrete pipe 300 mm dia	metre	60.000	7889.06	473343.34	M-151
		Granular soil with PI less than 6 for bedding and sides of pipe (0.6 x 0.6 x 60 m)	cum	21.600	1516.69	32760.51	M-009
		Collar for joints 300 mm dia	each	27.000	1136.95	30697.71	M-083
		Cement mortar 1:2 for joints	cum	0.060	11830.00	709.80	Item 12.6 (B)
		d) Machinery					
		Tractor-trolley	hour	1.500	357.99	536.98	P&M-053
		e) Overhead charges @ 10% on (b+c+d)				54041.87	
		f) Contractor's profit @ 16% on (b+c+d+e)				95113.69	
		Cost for 20 metre = a+b+c+d+e+f				733549.46	
		Rate per metre = (a+b+c+d+e+f)/20				36677.47	
					say	36677.00	
	Note	1. Inspection chamber at both ends is the responsibility of the agency who is laying the duct. Hence not included.					
		2. The rates for stone masonry / brick masonry and cement mortar to be adopted from respective clauses.					
8.30	Suggestive	Highway Patrolling and Traffic Aid Post					
		It is proposed to locate one Traffic Aid Post every 50-60 km of the highway.					
		The organisation and financial aspect are required to be finalised in consultation with administrative and traffic authorities .					
8.31	Suggestive	Items Related to Underpass/ Subway/ Overhead Bridge/ Overhead Foot Bridge					
		The items involved for underpass/ subway/ overhead bridge/ overhead foot bridge are earthwork, plain cement concrete, plastering, painting, information sign etc. The rates for these items are available in respective chapters which can be adopted for the quantities derived from the approved designs and drawings					
8.32	Suggestive	Traffic Control System and Communication System					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Providing a traffic control centre and communication system including telecommunication facilities and related accessories, CCTV, radar, vehicle detection camera, central computer system					
			These are specialised item of telecommunication system and are the commercial products. The designer is required to contact the manufacturers to ascertain market prices. In case of civil works required to be executed for these installations, pricing may be done as per rates in relevant chapters for quantities derived as per approved design and drawing.					
			As regards the locations where such devices are required to be installed, the traffic control authority should be consulted to finalise the location					
8.33	Suggestive		Gantry Mounted Variable Message Sign Board					
			Providing and erecting gantry mounted variable message sign board electronically operated capable of flashing the desired message over a designed support system of aluminium alloy or galvanised steel, erected as per approved design and drawings and with lateral clearance as per clause 802.3					
		(i)	Gantry Support System					
			Unit = tonne					
			Taking output=1 tonne					
			a) Labour					
			Mate	day	0.120	582.53	69.90	L-12
			Mazdoor	day	2.000	529.57	1059.14	L-13
			Blacksmith	day	1.000	635.48	635.48	L-02
			b) Material					
			Aluminium alloy/galvanised steel including 5 per cent wastage	tonne	1.050	67947.19	71344.54	M-060
			Add 15 per cent of cost of material for fabrication and erection.				10701.68	
			Add 1 per cent of cost of material for nuts, bolts and welding				713.45	
			c) Machinery					
			Truck 10 tonne	hour	1.000	1006.18	1006.18	P&M-057
			d) Overhead charges @ 10% on (a+b+c)				8553.04	
			e) Contractor's profit @ 16% on (a+b+c+d)				15053.35	
			Rate per tonne = a+b+c+d+e				109136.77	
						say	109137.00	
8.33		(ii)	Message Display					
			Message display board 6 sqm electronically operated with complete electronic fittings for flashing the pre-determined messages.					
			This is a specialised commercial product and the lumpsum rate including erection at site is required to be ascertained from the market and including in the rate analysis. The size of the board will vary depending upon specific location.					
			The rate for the gantry mounted variable sign would be the addition of cost of gantry support system as per approved design determined at (i) above and the cost of message display board as ascertained from the market at (ii) above					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.34	Suggestive		Traffic Impact Attenuators at Abutments and Piers					
		A	With Scrap Tyres					
			Provision and installation of traffic attenuators at abutment/pier of flyovers bridges using scrap tyres of size 100 x 20 retrieved from trucks laid in 2 rows and 4 tiers, one above the other and tied with 20 mm wire rope as per approved design and drawings.					
			Unit = sqm					
			Taking output = 20sqm					
			a) Labour					
			Mate	day	0.080	582.53	46.60	L-12
			Mazdoor	day	1.500	529.57	794.35	L-13
			Blacksmith	day	0.250	635.48	158.87	L-02
			b) Material					
			Scrap tyres of size 900 x 20	each	80.000	433.12	34649.97	M-161
			20 mm steel wire rope	kg	150.000	269.02	40353.23	M-176
			Add 1 per cent of cost of wire rope for clamps etc.				403.53	
			c) Machinery					
			Tractor-trolley	hour	3.000	357.99	1073.97	P&M-053
			d) Overhead charges @ 10% on (a+b+c)				7748.05	
			e) Contractor's profit @ 16% on (a+b+c+d)				13636.57	
			Cost for 20 sqm = a+b+c+d+e				98865.15	
			Rate per sqm = (a+b+c+d+e)/20				4943.26	
						say	4943.00	
8.34		B	Using Plastic/Steel Barrel, Filled with Sand					
			Provision and installation of traffic impact attenuator at abutment/pier of flyovers bridges using plastic/steel barrels 0.60 m dia and 1.0 m in height, filled with sand in three rows and tied with 20 mm steel wire rope as per approved design and drawings					
			Unit = sqm					
			Taking output = 20sqm					
			a) Labour					
			Mate	day	0.130	582.53	75.73	L-12
			Mazdoor	day	3.000	529.57	1588.71	L-13
			Blacksmith	day	0.250	635.48	158.87	L-02
			b) Material					
			Plastic barrels	each	50.000			
			or					
			Steel barrels	each	50.000	161.41	8070.65	M-172
			Sand	cum	8.000	1297.45	10379.57	M-004
			20 mm steel wire rope	kg	15.000	269.02	4035.32	M-176
			Add 1 per cent of cost of wire rope for clamps etc.				40.35	
			c) Machinery					
			Tractor-trolley	hour	2.000	357.99	715.98	P&M-053
			d) Overhead charges @ 10% on (a+b+c)				2506.52	
			e) Contractor's profit @ 16% on (a+b+c+d)				4411.47	
			Cost for 20 sqm = a+b+c+d+e				31983.17	
			Rate per sqm = (a+b+c+d+e)/20				1599.16	
						say	1599.00	
8.34		C	With HI - DRO cell Sandwich (Patented)					
			(In this patented HI - DRO cell system, water gets discharged from plastic tubes on impact over a pre-determined time, thus absorbing the energy)					
			Providing and installing a patented HI - DRO cell system as a traffic impact attenuators, using plastic tubes 50 cm dia, 1.2 m in height, 25 mm opening at the top, placed in three rows, filled with water and tied with a 20 mm steel wire rope					
			Unit = sqm					
			Taking output = 10sqm					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.100	582.53	58.25	L-12
		Mazdoor	day	2.500	529.57	1323.92	L-13
		b) Material					
		Plastic tubes 50 cm dia, 1.2 m high	each	40.000	302.65	12105.97	M-139
		Cost of water	KL	12.000	529.57	6354.84	M-189
		20 mm steel wire rope	kg	100.000	269.02	26902.15	M-176
		Add 1 per cent of cost of wire rope for clamps etc.				269.02	
		c) Machinery					
		Tractor-trolley	hour	2.000	357.99	715.98	P&M-053
		Water tanker 6 KL capacity	hour	2.000	819.77	1639.55	P&M-060
		d) Overhead charges @ 10% on (a+b+c)				4936.97	
		e) Contractor's profit @ 16% on (a+b+c+d)				8689.06	
		Cost for 10 sqm = a+b+c+d+e				62995.72	
		Rate per sqm = (a+b+c+d+e)/10				6299.57	
					say	6300.00	
8.35	Suggestive	Road Markers/Road Stud with Lense Reflector					
		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					
		Unit = Nos					
		Taking output = 50Nos					
		a) Labour					
		Mate	day	0.040	582.53	23.30	L-12
		Mazdoor	day	1.000	529.57	529.57	L-13
		b) Material					
		Aluminium studs 100 x 100 mm fitted with lense reflectors	each	50.000	1748.64	87431.99	M-062
		Add 10 per cent of cost of material for fixing and installation				8743.20	
		c) Overhead charges @ 10% on (a+b)				9672.81	
		d) Contractor's profit @ 16% on (a+b+c)				17024.14	
		Cost for 50 studs = a+b+c+d				123425.00	
		Rate per studs = (a+b+c+d)/50				2468.50	
					say	2469.00	
8.36	Suggestive	Traffic Cone					
		Provision of red fluorescent with white reflective sleeve traffic cone made of low density polyethylene (LDPE) material with a square base of 390 x 390 x 35 mm and a height of 770 mm, 4 kg in weight, placed at 1.5 m interval, all as per BS 873					
		Unit = Running metre					
		Taking output = 68 Nos.					
		a) Labour					
		Mate	day	0.020	582.53	11.65	L-12
		Mazdoor	day	0.500	529.57	264.78	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Material					
		Traffic cones with 150 mm reflective sleeve	each	68.000	1237.50	84149.93	M-186
		c) Machinery					
		Tractor-trolley	hour	0.100	357.99	35.80	P&M-053
		d) Overhead charges @ 10% on (a+b+c)				8446.22	
		e) Contractor's profit @ 16% on (a+b+c+d)				14865.34	
		Cost for 68 Nos. = a+b+c+d+e				107773.72	
		Rate per metre = (a+b+c+d+e)/68				1584.91	
					say	1585.00	
8.37	Suggestive	Roadside Amenities					
		A Rest areas					
		Providing plainly furnished accommodation for rest rooms, dormitories, restaurants, stalls, shops, petrol pump, telephone booth, first aid room, traffic aid post, police assistance booth, including electricity, toilet and sewerage system					
		Pricing may be done based on current plinth area rates approved by PWD/CPWD/MES for a particular zone. Area is required to be assessed for specific location as per actual site conditions					
		B Parking areas and bus laybys for trucks, buses and light vehicles					
		Pricing of parking areas may be done for the quantities of various items based on the approved dimensions and pavement design for a particular terrain and soil. Rates for items may be from respective chapters.					
		C Lawn					
		Providing a lawn planted with grass and its maintenance					
		Pricing of lawn may be done as per rates given in the chapter on horticulture for the quantities as per approved dimensions in the drawings					
8.38	Suggestive	Rumble Strips					
		Provision of 15 nos rumble strips covered with premix bituminous carpet, 15-20 mm high at center, 250 mm wide placed at 1 m center to center at approved locations to control speed, marked with white strips of road marking paint.					
		Unit = sqm					
		Taking output = 100 sqm (including gaps)					
		The rate per sqm of premix carpet and road marking may be adopted from chapter 5 & 8 respectively for the quantities calculated from approved drawings					
8.39	Suggestive	Policeman Umbrella					
		Provision of a 2 m high (floor to roof) umbrella for traffic policeman at road crossings, where necessary, installed on a raised platform, built on a central support of a steel pipe 100 mm dia, roof made of 25 mm dia steel pipe to provide covered area of 3 sqm, roofed with CGI sheets, all steel parts to be given 2 coats of paint					
		Unit = each					
		Taking output = one number					
		Earthwork	cum				
		Cement Concrete	cum				
		brick masonry or	cum				
		stone masonry	cum				
		Painting	sqm	2.500			
		a) Labour					
		Mate	day	0.090			
		Mazdoor	day	1.000			
		Blacksmith	day	1.000			
		Welder	day	0.250			
		b) Material					
		Steel pipe 100 mm dia	metre	3.500			

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Steel pipe 25 mm dia	metre	10.000			
		CGI sheets	kg	8.000			
		Add 25 per cent of cost of material for fabrication					
		Add 2 per cent of cost of material for welding consumables, J-hooks, washers etc.					
		c) Machinery					
		Tractor-trolley	hour	0.500			
		d) Overheads @ per cent on (a+b+c)					
		e) Contractors Profit @ per cent on (a+b+c+d)					
		Rate per policeman umbrella = a+b+c+d+e					
8.40	suggestive	High Mast Pole Lighting at Interchanges and Flyovers					
		Providing and erecting a high mast pole lighting with 30 m high hot dip galvanised mast designed to withstand forces exerted with wind speeds of 180 km per hour with 3 seconds gust, as per IS:875 (Part 3) - 1978, fitted with a base flange, door at the base of mast with heavy duty internal lock, lantern carriage, suitable winching arrangement for safe working load of 750 kg and high powered electrically driven power tools for raising and lowering of lantern carriage, flexible 8 core electric cable, lightning conductor, earthing terminal, and fixing 2 nos aviation obstruction lights on top of the mast, all complete as per approved design and drawings					
		This is a specialised work and is generally done by firms who specialise in such jobs. The detailed designs and estimates are submitted by the firms along with their tender for checks by the Department. The cost of this work is required to be worked out based on approved design, drawings and estimate of the lowest tender. A separate contract for this work is concluded as the contractors for road and bridge works generally do not undertake such jobs.					
8.41		Toll Plaza					
		The construction, operation and maintenance of Toll Plaza can be broken into separate items of work as under based on the approved design and drawings:-					
		a) Provision of toll collection service lane to separate different categories of vehicles for purpose of toll collection. This involves considerable increase in carriage way width					
		b) Provision of 2.5 m wide separators for different toll collection service lanes for safety					
		c) Toll booths with integrated roof cover					
		d) Barrier gates for individual lanes					
		e) Provision of building to provide facility to toll plaza personnel					
		f) Toll plaza office equipment and furniture					
		g) Water supply, electricity, sanitation, septic-tank system and drainage					
		h) Telephone, intercoms, wireless communication system					
		i) High mast lighting					
		j) Pavement marking					
		k) Overhead signs					
		l) Fixed message signs (Advance)					
		m) Variable message signs					
		n) Traffic cones and pylons					
		o) First aid post					
		p) Traffic aid post and security					
		The quantities for the above mentioned items may be calculated from the approved design and drawings and their rates adopted from respective chapters of the Standard Data Book					
8.42		Safety Devices and Signs in Construction Zones					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Provision and fixing of traffic signs for limited period at suitable locations in construction zone comprising of warning zone, approach transition zone, working zone and terminal transition zone with a minimum distance of 60 cm from the edge of the kerb in case of kerbed roads and 2 to 3 m from the edge of the carriageway in case of un-kerbed roads, the bottom edge of the lowest sign plate to be not less than 2 m above the road level, fixed on 60 mm x 60 mm x 6 mm angle iron post, founded and installed as per approved design and drawings, removed and disposed of after completion of construction work, all as per IRC:SP:55-2001					
		Unit = each					
		Taking output = one sign post					
		Following types of signs are required to be fixed in construction zones for safety of traffic					
		a) Diversion one km ahead					
		b) Traffic sign ahead					
		c) Road ahead closed					
		d) Men at work					
		e) Road narrow					
		f) Single file traffic					
		g) Right lane diverted					
		h) Left lane diverted					
		i) Right lane closed					
		j) Left lane closed					
		k) Median closed					
		l) Diversion to other carriageway					
		m) Traffic signal ahead					
		n) Two way traffic					
		o) Un - even road					
		p) Slippery road					
		q) Loose chippings					
		r) Dual carriageway ends					
		s) Diversion					
		t) Do not enter					
		u) Road closed					
		v) Stop					
		w) Slow					
		x) One way					
		y) Give way					
		z) Overtaking prohibited					
		aa) Speed limit					
		bb) Weight limit					
		cc) Height and length limit					
		dd) No stopping or standing					
		ee) Any other warning or regulatory safety sign as per site requirement and consistent with IRC:SP:55-2001 and IRC:67					
		The rate for traffic signs are already worked out and given elsewhere in this chapter. The same may be adopted.					
8.43	suggestive	Portable Barricade in Construction Zone					
		Installation of a steel portable barricade with horizontal rail 300 mm wide, 2.5 m in length fitted on a 'A' frame made with 45 x 45 x 5 mm angle iron section, 1.5 m in height, horizontal rail painted (2 coats) with yellow and white stripes, 150 mm in width at an angle of 450, 'A' frame painted with 2 coats of yellow paint, complete as per IRC:SP:55-2001					
		Unit = each					
		Taking output = one steel portable barricade					
		a) Labour					
		Mate	day	0.020	582.53	11.65	L-12

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Mazdoor	day	0.250	529.57	132.39	L-13
			Painter	day	0.500	635.48	317.74	L-18
			Welder	day	0.250	635.48	158.87	L-02
			b) Material					
			Angle iron 45 x 45 x 5 mm	kg	25.000	60.67	1516.68	M-179 /1000
			MS sheet 300 mm wide, 2.5 m long and 2.6 mm thick	kg	15.000	60.67	910.01	M-179 /1000
			Paint	litre	0.500	538.04	269.02	M-131
			Add 2 per cent of cost of steel for welding consumables, nuts & bolts and drilling holes				48.53	
			c) Overhead charges @ 10% on (a+b)				336.49	
			d) Contractor's profit @ 16% on (a+b+c)				592.22	
			Rate per barricade = a+b+c+d				4293.61	
						say	4294.00	
8.44	suggestive		Permanent Type Barricade in Construction Zone					
		A	With steel components					
			Construction of a permanent type barricade made of steel components, 1.5 m high from road level, fitted with 3 horizontal rails 200 mm wide and 4 m long on 50 x 50 x 5 mm angle iron vertical support, painted with yellow and white strips, 150 mm in width at an angle of 45°, complete as per IRC:SP:55-2001					
			Unit = each					
			Taking output = one barricade					
			a) Labour					
			Mate	day	0.050	582.53	29.13	L-12
			Mazdoor	day	0.300	529.57	158.87	L-13
			Painter	day	0.600	635.48	381.29	L-18
			Welder	day	0.300	635.48	190.65	L-02
			b) Material					
			Angle iron 50 x 50 x 5 mm, 2 m long, 2 Nos.	kg	15.000	60.67	910.01	M-179 /1000
			MS sheet of 12 SWG, 3 Nos of 200 mm width and 4 m length	kg	50.000	60.67	3033.36	M-179 /1000
			Paint	litre	1.000	538.04	538.04	M-131
			Add 1 per cent of cost of steel for welding consumables, nuts & bolts and drilling holes				78.87	
			c) Overhead charges @ 10% on (a+b)				532.02	
			d) Contractor's profit @ 16% on (a+b+c)				936.36	
			Rate per barricade = a+b+c+d				6788.58	
						say	6789.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.44		B	With wooden components					
			Construction of a permanent type barricade made of wooden components, 1.5 m high from road level, fitted with 3 horizontal planks 200 mm wide and 3.66 m long on 100 x 100mm wooden vertical post, painted with yellow and white strips, 150 mm in width at an angle of 45°, complete as per IRC:SP:55-2001					
			Unit = each					
			Taking output = one barricade					
			a) Labour					
			Mate	day	0.050	582.53	29.13	L-12
			Mazdoor	day	0.300	529.57	158.87	L-13
			Painter	day	0.600	635.48	381.29	L-18
			Carpenter	day	0.600	635.48	381.29	L-04
			b) Material					
			Timber	cum	0.180	24308.85	4375.59	M-185
			Add 1 per cent of cost of timber for nuts & bolts, nails, etc.				43.76	
			c) Overhead charges @ 10% on (a+b)				536.99	
			d) Contractor's profit @ 16% on (a+b+c)				945.11	
			Rate per barricade = a+b+c+d				6852.03	
						say	6852.00	
8.44		C	With bricks					
			Construction of a permanent type barricade made with brick work in mud mortar, 1.5 m high, 4 m long, 600 mm thick, plastered with cement mortar 1:6, painted with yellow and white strips					
			Unit = each					
			Taking output = one barricade					
			a) Labour					
			Mate	day	0.240	582.53	139.81	L-12
			Mazdoor	day	3.000	529.57	1588.71	L-13
			Painter	day	1.000	635.48	635.48	L-18
			Mason	day	2.000	635.48	1270.97	L-11
			b) Material					
			Brick	each	1800.000	19.66	35396.45	M-079
			Cement	kg	22.000	7.17	157.72	M-081 /1000
			Sand	cum	0.090	6977.61	627.99	M-005
			Paint	litre	1.250	538.04	672.55	M-131
			c) Overhead charges @ 10% on (a+b)				4048.97	
			d) Contractor's profit @ 16% on (a+b+c)				7126.18	
			Rate per barricade = a+b+c+d				51664.83	
						say	51665.00	
8.45	suggestive		Drum Delineator in Construction Zone					
			Provision of metal drum/empty bitumen drum delineator, 300 mm in diameter, 800 mm high, filled with earth for stability, painted in circumferential strips of alternate black and white 100 mm wide fitted with reflectors 3 Nos of 7.5 cm dia, all as per IRC:SP:55-2001					
			Unit = each					
			Taking output = one drum delineator					
			a) Labour					
			Mate	day	0.020	582.53	11.65	L-12
			Mazdoor	day	0.250	529.57	132.39	L-13
			Painter	day	0.250	635.48	158.87	L-18

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Material					
		Steel drum 300 mm dia 1.2 m high/empty bitumen drum	each	1.000	161.41	161.41	M-172
		Paint	litre	0.500	538.04	269.02	M-131
		c) Overhead charges @ 10% on (a+b)				73.33	
		d) Contractor's profit @ 16% on (a+b+c)				129.07	
		Rate per drum delineator = a+b+c+d				935.75	
					say	<u>936.00</u>	
8.46	suggestive	Flagman					
		Positioning of a smart flagman with a yellow vest and a yellow cap and a red flag 600 x 600 mm securely fastened to a staff 1 m in length for guiding the traffic					
		Unit = each					
		Taking output = one flagman					
		a) Labour					
		Mate	day	0.040	582.53	23.30	L-12
		Mazdoor	day	1.000	529.57	529.57	L-13
		b) Material					
		Flag of red color cloth 600 x 600 mm	each	1.000	69.95	69.95	M-099
		Wooden staff for fastening of flag 25 mm dia, one m long	each	1.000	12.71	12.71	M-196
		c) Overhead charges @ 10% on (a+b)				63.55	
		d) Contractor's profit @ 16% on (a+b+c)				111.85	
		Rate per flagman = a+b+c+d				810.93	
					say	<u>811.00</u>	

CHAPTER-9								
PIPE CULVERTS								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
9.1	408		PCC 1:3:6 in Foundation					
			Plain cement concrete 1:3:6 mix with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.					
			Unit = cum					
			Taking output = 15 cum					
			a) Labour					
			Mate	day	0.640	582.53	372.82	L-12
			Mason	day	1.000	635.48	635.48	L-11
			Mazdoor	day	15.000	529.57	7943.55	L-13
			b) Material					
			40mm Aggregate at site	cum	13.800	1919.16	26484.43	M-055
			Sand at site	cum	6.900	6977.61	48145.53	M-005
			Cement at site	tonne	3.300	7169.28	23658.62	M-081
			Cost of water	KL	18.000	529.57	9532.26	M-189
			c) Machinery					
			Concrete mixer0.4/ 0.28 cum	hour	6.000	375.99	2255.97	P&M-009
			Generator set 33 KVA	hour	6.000	1075.56	6453.34	P&M-079
			Water tanker6 KL capacity	hour	3.000	819.77	2459.32	P&M-060
			d) Overhead charges @ 10% on (a+b+c)				12794.13	
			e) Contractor's profit @ 16% on (a+b+c+d)				22517.67	
			Cost for 15 cum = a+b+c+d+e				163253.12	
			Rate per cum = (a+b+c+d+e)/15				10883.54	
						say	10884.00	
		Note	Vibrator is a part of minor T & P which is already included in overhead charges of the contractor.					
9.2	2900		Laying Reinforced Cement Concrete Pipe NP4 / Prestressed Concrete Pipe on First Class Bedding in Single Row .					
			Laying Reinforced cement concrete pipe NP4/prestressed concrete pipe for culverts on first class bedding of granular material in single row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets .					
			Unit = metre					
			Taking output = 12.5 metres (5 pipes of 2.5 m length each)					
		A	1000 mm dia					
			a) Labour					
			Mate	day	0.180	582.53	104.85	L-12
			Mason	day	0.500	635.48	317.74	L-11
			Mazdoor	day	4.000	529.57	2118.28	L-13
			b) Material					
			Sand at site	cum	0.070	7753.27	542.73	M-005
			Cement at site	tonne	0.050	7169.28	358.46	M-081
			RCC pipe NP-4 /prestressed concrete pipe including collar at site	metre	12.500	15065.20	188315.05	M-149
			Granular material passing 5.6 mm sieve for bedding	cum	4.500	1516.69	6825.11	M-009
			c) Overhead charges @ 10% on (a+b)				19858.22	
			d) Contractor's profit @ 16% on (a+b+c)				34950.47	
			Cost for 12.5 metres = a+b+c+d				253390.92	
			Rate per metre = (a+b+c+d)/12.5				20271.27	
						say	20271.00	
		Note	1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added .					
			2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
9.2		B	1200 mm dia					
			a) Labour					
			Mate	day	0.280	582.53	163.11	L-12
			Mason	day	1.000	635.48	635.48	L-11
			Mazdoor	day	6.000	529.57	3177.42	L-13
			b) Material					
			Sand at site	cum	0.090	7753.27	697.79	M-005
			Cement at site	tonne	0.070	7169.28	501.85	M-081
			RCC pipe NP-4/prestressed concrete pipe including collar at site	metre	12.500	16242.17	203027.17	M-150
			Granular material passing 5-6 mm sieve for class bedding	cum	5.000	1516.69	7583.45	M-009
			c) Overhead charges @ 10% on (a+b)				21578.63	
			d) Contractor's profit @ 16% on (a+b+c)				37978.38	
			Cost for 12.5 metres = a+b+c+d				275343.29	
			Rate per metre = (a+b+c+d)/12.5				22027.46	
						say	22027.00	
		Note	1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added .					
			2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections					
9.3	2900		Laying Reinforced Cement Concrete Pipe NP4 / Prestressed Concrete Pipe on First Class Bedding in Double Row .					
			Laying Reinforced cement concrete pipe NP4 / prestressed concrete pipe for culverts on first class bedding of granular material in double row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets .					
			Unit = metre					
			Taking output = 12.5 metres (10 pipes of 2.5 m length each in two rows.)					
		A	1000 mm dia					
			a) Labour					
			Mate	day	0.360	582.53	209.71	L-12
			Mason	day	1.000	635.48	635.48	L-11
			Mazdoor	day	8.000	529.57	4236.56	L-13
			b) Material					
			Sand at site	cum	0.140	7753.27	1085.46	M-005
			Cement at site	tonne	0.100	7169.28	716.93	M-081
			RCC pipe NP-4/prestressed concrete pipe including collar at site	metre	25.000	16242.17	406054.33	M-149
			Granular material passing 5.6 mm sieve for bedding	cum	12.500	1516.69	18958.63	M-009
			c) Overhead charges @ 10% on (a+b)				43189.71	
			d) Contractor's profit @ 16% on (a+b+c)				76013.89	
			Cost for 12.5 metres = a+b+c+d				551100.70	
			Rate per metre = (a+b+c+d)/12.5				44088.06	
		Note	1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added .					
			2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections					
						say	44088.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
9.3		B	1200 mm dia					
			a) Labour					
			Mate	day	0.560	582.53	326.22	L-12
			Mason	day	2.000	635.48	1270.97	L-11
			Mazdoor	day	12.000	529.57	6354.84	L-13
			b) Material					
			Sand at site	cum	0.180	7753.27	1395.59	M-005
			Cement at site	tonne	0.140	7169.28	1003.70	M-081
			RCC pipe NP-4 /prestressed concrete pipe including collar at site	metre	25.000	16242.17	406054.33	M-150
			Granular material passing 5-6 mm sieve for class bedding	cum	13.750	1516.69	20854.49	M-009
			c) Overhead charges @ 10% on (a+b)				43726.01	
			d) Contractor's profit @ 16% on (a+b+c)				76957.78	
			Cost for 12.5 metres = a+b+c+d				557943.93	
			Rate per metre= (a+b+c+d)/12.5				44635.51	
		Note	1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added .			say	<u>44636.00</u>	
			2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections					

CHAPTER- 10								
MAINTENANCE OF ROADS								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
10.1	3002		Restoration of Rain Cuts					
			Restoration of rain cuts with soil, moorum, gravel or a mixture of these, clearing the loose soil, benching for 300 mm width, laying fresh material in layers not exceeding 250 mm and compacting with plate compactor or power rammers to restore the original alignment, levels and slopes					
			Unit = cum					
			Taking output = 10 cum					
			a) Labour					
			Mate	day	0.080	582.53	46.60	L-12
			Mazdoor	day	2.000	529.57	1059.14	L-13
			b) Machinery					
			Excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.130	1444.67	187.81	P&M-026
			Tipper (L is average lead in km for borrow earth)	tonne.km	12 x L	8.90	1067.61	Lead =10 km & P&M-058
			Add 10 per cent of cost of carriage towards loading and unloading charges.				106.76	
			Plate compactor	hour	0.500	187.94	93.97	P&M-086
			c) Overhead charges @ 10% on (a+b)				256.19	
			d) Contractor's profit @ 16% on (a+b+c)				450.89	
			Cost for 10 cum = a+b+c+d				3268.98	
			Rate per cum = (a+b+c+d)/10				326.90	
						say	327.00	
		Note	Only 75 per cent of fresh material has been provided as 25 per cent can be retrieved at site from earth that is flown down the slope in the form of slurry and deposited at the foot of there in cuts					
10.2	3003		Maintenance of Earthen Shoulder (filling with fresh soil)					
			Making up loss of material/ irregularities on shoulder to the design level by adding fresh approved soil and compacting it with appropriate equipment.					
			Unit = sqm					
			Taking output = 100 sqm					
			Assuming average thickness of filling to be 150 mm					
			Quantity of fresh material = 15 cum					
			a) Labour					
			Mate	day	0.180	582.53	104.85	L-12
			Mazdoor	day	4.500	529.57	2383.06	L-13
			b) Machinery					
			Excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.250	1444.67	361.17	P&M-026
			Tipper (L is average lead in km for borrow earth)	tonne.km	24xL	8.90	2135.23	Lead =10 km & P&M-058
			Add 10 per cent of cost of transportation to cover cost of loading and unloading				213.52	
			Plate compactor @ 25 sqm per hour	hour	12.000	187.94	2255.33	P&M-086
			c) Overhead charges @ 10% on (a+b)				745.32	
			d) Contractor's profit @ 16% on (a+b+c)				1311.76	
			Cost for 100 sqm = a+b+c+d				9510.24	
			Rate per sqm = (a+b+c+d)/100				95.10	
						say	95.00	
10.3	3003		Maintenance of Earth Shoulder (stripping excess soil)					
			Stripping excess soil from the shoulder surface to achieve the approved level and compacting with plate compactor					
			Unit = sqm					
			Taking output = 100 sqm					
			Assuming average depth of stripping as 75 mm					
			Quantity of earth cutting involved = 7.5 cum					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.100	582.53	58.25	L-12
		Mazdoor	day	2.500	529.57	1323.92	L-13
		b) Machinery					
		Plate compactor @ 25 sqm per hour	hour	4.000	187.94	751.78	P&M-086
		c) Overhead charges @ 10% on (a+b)				213.40	
		d) Contractor's profit @ 16% on (a+b+c)				375.58	
		Cost for 100 sqm = a+b+c+d				2722.93	
		Rate per sqm on = (a+b+c+d)/100				27.23	
					say	27.20	
		Note The earth stripped from earthen shoulders to be dumped on the side slopes locally for disposal.					
10.4	3004.2	Filling Pot-holes and Patch Repairs with open-Graded Premix surfacing, 20mm.					
		Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 511, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2					
		Unit = Sqm					
		Taking out put = 10250 sqm (205 cum)/(405 tonne)					
		a) Labour					
		Mate	Day	3.760	582.53	2190.30	L-12
		Mazdoor	Day	90.000	529.57	47661.29	L-13
		Mazdoor skilled	Day	4.000	688.44	2753.76	L-15
		b) Machinery					
		Air compressor 250 cfm	hour	6.000	887.56	5325.35	P&M-001
		HMP 100-110 TPH Capacity	hour	6.000	18085.02	108510.14	P&M-021
		Tipper 10 tonnes capacity	hour	45.000	1006.18	45278.23	P&M-048
		Smooth wheeled roller 8-10 tonnes	hour	12.000	510.51	6126.06	P&M-044
		c) Material					
		Crushed stone aggregates nominal size 13.2mm	cum	184.500	2360.40	435493.60	M-052
		Crushed stone aggregates nominal size 11.2mm	cum	92.250	2372.05	218821.56	M-051
		Bitumen 80/100	tonne	14.970	41771.81	625323.92	M-075
		Bitumen emulsion for tack coat including vertical sides of pot hole.	tonne	2.460	64904.31	159664.59	M-077
		d) Overhead charges @ 10% on (a+b+c)				165714.88	
		e) Contractor's profit @ 16% on (a+b+c+d)				291658.19	
		Cost for 10250 sqm = a+b+c+d+e				2114521.89	
		Rate per sqm = (a+b+c+d+e)/10250				206.29	
					say	206.00	
10.5	3004.2	Filling Pot-holes and Patch Repairs with Bituminous concrete, 40mm.					
		Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 504, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2					
		Unit = Sqm					
		Taking out put = 4900 sqm (196 cum)/(450 Tonnes)					
		a) Labour					
		Mate	Day	2.920	582.53	1700.98	L-12
		Mazdoor	Day	70.000	529.57	37069.89	L-13
		Mazdoor skilled	Day	3.000	688.44	2065.32	L-15
		b) Machinery					
		Air compressor 250 cfm	hour	6.000	887.56	5325.35	P&M-001
		HMP 100-110 TPH Capacity	hour	6.000	15726.11	94356.65	P&M-022
		Tipper 10 tonnes capacity	hour	45.000	1006.18	45278.23	P&M-048
		Smooth wheeled roller 8-10 tonnes	hour	12.000	510.51	6126.06	P&M-044
		c) Material					
		1) Bitumen	tonne	22.500	41771.81	939865.61	M-075

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		ii) Bitumen emulsion for tack coat .	tonne	1.180	64904.31	76587.08	M-077
		iii) Aggregates					
		Grading I - 19mm(Nominal size)					
		20-10mm 35 per cent	cum	99.750	2485.00	247878.75	M-051,M-052,M-053 and M-054
		10-5 mm 23 per cent	cum	65.550	2013.21	131966.11	M-025
		5mm and below 40 per cent	cum	114.000	2542.00	289788.00	M-021,M-022 and M-024
		Add 5 per cent for wastage				33481.64	
		or					
		Grading-II 13mm (Nominal size)					
		13.2-10 mm 30 per cent	cum	85.500	2366.00	202293.00	M-051 and M-052
		10-5 mm 25 per cent	cum	71.250	2013.21	143441.42	M-025
		5 mm and Below 43 per cent	cum	122.550	2542.00	311522.10	M-021,M-022 and M-024
		Filler 2 per cent	tonne	9.000	13451.08	121059.68	M-188
		Add 5 per cent for wastage				38915.81	
		Any one of the above alternatives of aggregate i.e. 19mm or 13mm nominal size may be adopted as per approved design.					
10.5	(i)	for grading I Material					
		d) Overhead charges @ 10% on (a+b+c)				191148.97	
		e) Contractor's profit @ 16% on (a+b+c+d)				336422.18	
		Cost for 4900 cum = a+b+c+d+e				2439060.83	
		Rate per cum = (a+b+c+d+e)/4900				497.77	
					say	498.00	
10.5	(ii)	for grading II Material					
		d) Overhead charges @ 10% on (a+b+c)				202560.72	
		e) Contractor's profit @ 16% on (a+b+c+d)				356506.86	
		Cost for 4900 cum = a+b+c+d+e				2584674.77	
		Rate per cum = (a+b+c+d+e)/4900				527.48	
					say	527.00	
	Note	For detailed working of quantities of aggregates, refer item 5.8 of chapter 5					
10.6	3004.3.3	Crack Filling					
		Filling of crack using slow - curing bitumen emulsion and applying crusher dust in case crack are wider than 3mm.					
		Unit = Running Meter					
		Taking out put = 500m					
		a) Labour					
		Mate	day	0.040	582.53	23.30	L-12
		Mazdoor	day	1.000	529.57	529.57	L-13
		b) Material					
		Slow-curing bitumen emulsion	Kg	33.000	65.00	2145.00	M-077
		Stone crusher dust	cum	0.020	1378.81	27.58	M-021

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Overhead charges @ 10% on (a+b)				272.54	
		d) Contractor's profit @ 16% on (a+b+c)				479.68	
		Cost for 500sqm = a+b+c+d				3477.67	
		Rate per meter = (a+b+c+d+e)/500				6.96	
					say	<u>7.00</u>	
10.7	3004.4	Dusting					
		Applying crusher dust to areas of road where bleeding of excess bitumen has occurred.					
		Unit = Sqm					
		Taking output = 3500 sqm					
		a) Labour					
		Mate	day	0.080	582.53	46.60	L-12
		Mazdoor	day	2.000	529.57	1059.14	L-13
		b) Material					
		Stone crusher dust finer than 3mm with not more than 10 per cent passing 0.075 sieve.	cum	6.250	1378.81	8617.56	M-021
		c) Overhead charges @ 10% on (a+b)				972.33	
		d) Contractor's profit @ 16% on (a+b+c)				1711.30	
		Cost for 3500sqm = a+b+c+d				12406.93	
		Rate per meter = (a+b+c+d)/3500				3.54	
					say	<u>3.54</u>	
10.8	(A) 3004.3.2	Fog Seal	sqm			74.00	Item 5.17
	(B) 3004.3.4	Crack Prevention courses.					
		(i) Stress Absorbing Membrane (SAM) crack width less than 6 mm	sqm			91.00	Item 5.21 Case-I
		(ii) Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm	sqm			118.00	Item 5.21 Case-II
		(iii) Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 per cent	sqm			205.60	Item 5.21 Case-IV
		(iv) Bitumen Impregnated Geotextile	sqm			164.00	Item 5.21 Case-IV
10.8	(C) 3004.5	Slurry Seal					
		(i) 5 mm thickness	sqm			164.00	Item 5.15 Case-I
		(ii) 3 mm thickness	sqm			109.00	Item 5.15 Case-II
		(iii) 1.5 mm thickness	sqm			51.00	Item 5.15 Case-III
10.8	(D) 3004.6	Surface Dressing for maintenance works.					
		(i) 19 mm nominal chipping size	sqm			116.00	Item 5.9 Case-I
		(ii) 13 mm nominal size chipping	sqm			88.00	Item 5.9 Case-II
		The above mentioned items have already been included in chapter 5.					
10.9	3005.1	Repair of Joint Grooves with Epoxy Mortar					
		Repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints in concrete pavements using epoxy mortar or epoxy concrete					
		Unit = running metre					
		Taking output = 10 metres					
		a) Labour					
		Mate	day	0.040	582.53	23.30	L-12
		Mazdoor	day	0.500	529.57	264.78	L-13
		Chiseller	day	0.500	635.48	317.74	L-05
		b) Material					
		Epoxy primer	kg	2.500	577.05	1442.63	M-097
		Epoxy compound with accessories for preparing epoxy mortar	kg	10.000	742.50	7424.99	M-095
		c) Machinery					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Air compressor 250 cfm for cleaning	hour	0.050	887.56	44.38	P&M-001
		d) Overhead charges @ 10% on (a+b+c)				951.78	
		e) Contractor's profit @ 16% on (a+b+c+d)				1675.14	
		Cost for 10 metres = a+b+c+d+e				12144.75	
		Rate per metre = (a+b+c+d+e)/10				1214.47	
					say	1214.00	
10.10	3005.2	Repair of old Joints Sealant					
		Removal of existing sealant and re sealing of contraction, longitudinal or expansion joints in concrete pavement with fresh sealant material					
		Unit = running metre					
		Taking output = 10 metres					
		a) Labour					
		Mate	day	0.040	582.53	23.30	L-12
		Mazdoor	day	0.500	529.57	264.78	L-13
		b) Material					
		Primer	kg	0.250	266.33	66.58	M-146
		Sealant	kg	1.000	742.50	742.50	M-120
		c) Machinery					
		Air compressor 250 cfm for cleaning	hour	0.050	887.56	44.38	P&M-001
		d) Overhead charges @ 10% on (a+b+c)				114.15	
		e) Contractor's profit @ 16% on (a+b+c+d)				200.91	
		Cost for 10 metres = a+b+c+d+e				1456.61	
		Rate per metre = (a+b+c+d+e)/10				145.66	
					say	146.00	
10.11	3000	Hill Side Drain Clearance					
		Removal of earth from the choked hill side drain and disposing it on the valley side manually					
		Unit = running metre					
		Taking output = 10 metres					
		Assuming muck causing choking of drain to be 0.2 cum per metre, quantity of earth to be removed for 10 metres = 2 cum					
		a) Labour					
		Mate	day	0.080	582.53	46.60	L-12
		Mazdoor	day	1.000	529.57	529.57	L-13
		b) Overhead charges @ 10% on (a+b)				57.62	
		c) Contractor's profit @ 16% on (a+b)				101.41	
		Cost for 10 metres = a+b+c				735.20	
		Rate per metre = (a+b+c)/10				73.52	
					say	74.00	
10.12	3000	Land Slide Clearance in soil					
		Clearance of land slides in soil and ordinary rock by a bulldozer D 80 A-12, 180 HP and disposal of the same on the valley side					
		Unit = cum					
		Taking output = 100 cum					
		a) Labour					
		Mate	day	0.040	582.53	23.30	L-12
		Mazdoor	day	1.000	529.57	529.57	L-13
		b) Machinery					
		Dozer 180 HP @ 60 cum per hour	hour	1.670	3056.68	5104.65	P&M-014
		c) Overhead charges @ 10% on (a+b)				565.75	
		d) Contractor's profit @ 16% on (a+b+c)				995.72	
		Cost for 100 cum = a+b+c+d				7219.00	
		Rate per cum = (a+b+c+d)/100				72.19	
					say	72.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Note	Land Slide clearance involves pushing of loose earth slid on the road surface from hill face on the valley side. Since no cutting of original ground is involved, the output of dozer has been taken as 60 cum per hour for soil, ordinary rock and blasted hard rock. However, if there are objection to disposing of earth on valley side, additional resources for its disposal shall be considered as per site conditions.					
10.13	3000		Landslide Clearance in Hard Rock Requiring Blasting					
			Clearing of land slide in hard rock requiring blasting for 50 per cent of the boulders and disposal of the same on the valley side.					
			Unit = cum					
			Taking output = 100 cum					
			a) Labour					
			Mate	day	0.090	582.53	52.43	L-12
			Mazdoor	day	1.500	529.57	794.35	L-13
			Driller	day	0.750	635.48	476.61	L-06
			Blaster	day	0.070	635.48	44.48	L-03
			b) Machinery					
			Dozer D 80 A-12,180 HP @ 60 cum per hour	hour	1.670	3056.68	5104.65	P&M-014
			Air compressor 250 cfm with two jack hammer	hour	2.500	887.56	2218.90	P&M-001
			c) Materials					
			Gelatine 80 per cent @ 35 kg per 100 cum	kg	17.500	406.76	7118.31	M-104
			Electric Detonators @ 1 Detonator for 2 Gelatine sticks of 125 gms each	each	70.000	2.69	188.32	M-094 /100
			c) Overhead charges @ 10% on (a+b)				1599.81	
			d) Contractor's profit @ 16% on (a+b+c)				2815.66	
			Cost for 100 cum = a+b+c+d+e				20413.51	
			Rate per cum = (a+b+c+d+e)/100				204.14	
						say	204.00	
		Note	Credit for the rock if found acceptable as construction material shall be afforded					
10.14	3000		Snow Clearance on Roads with Dozer					
			Snow clearance from road surface by a bull- dozer 165 Hp and disposing it on the valley side					
			Unit = cum					
			Taking output = 5000 cum					
			a) Labour					
			Mate	day	0.080	582.53	46.60	L-12
			Mazdoor	day	2.000	529.57	1059.14	L-13
			b) Machinery					
			Dozer D 80 A-12,180 HP @ 850 cum per hour	hour	5.880	3056.68	17973.26	P&M-014
			c) Overhead charges @ 10% on (a+b)				1907.90	
			d) Contractor's profit @ 16% on (a+b+c)				3357.90	
			Cost for 5000 cum = a+b+c+d				24344.81	
			Rate per cum = (a+b+c+d)/5000				4.87	
						say	4.90	
		Note	i) Labour provided will not be cutting the snow. They will be guiding the dozer operator on the alignment of the road as entire surface gets covered with snow and the edges of the road are not visible and for changing the blade angle. Also they will keep a watch on the hill side for any eventuality of avalanches, slide etc					
10.15	3000		Snow Clearance on Roads with Snow Blowers					
			Snow clearance from road surface by a snow blower and disposing on the valley side.					
			Unit = cum					
			Taking output = 3600 cum					
			a) Labour					
			Mate	day	0.080	582.53	46.60	L-12
			Mazdoor	day	2.000	529.57	1059.14	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Machinery					
		Snow blower equipment 140 HP @ 600 cum per hour	hour	6.000	752.89	4517.34	P&M-087
		c) Overhead charges @ 10% on (a+b)				562.31	
		d) Contractor's profit @ 16% on (a+b+c)				989.66	
		Cost for 3600 cum (a+b+c+d)				7175.05	
		Rate per cum = (a+b+c+d)/3600				1.99	
					say	<u>2.00</u>	

CHAPTER-11								
HORTICULTURE								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
11.1	307		Spreading of Sludge Farm Yard Manure or/and good Earth					
			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)					
			Unit = cum					
			Taking output = 15 cum					
			a) Labour					
			Mate	day	0.040	582.53	23.30	L-12
			Mazdoor	day	1.000	529.57	529.57	L-13
			b) Overhead charges @ 10% on (a)				55.29	
			c) Contractor's profit @ 16% on (a+b)				97.31	
			Cost for 15 cum= a+b+c				705.46	
			Rate per cum = (a+b+c)/15				47.03	
						say	47.00	
11.2	307		Grassing with ' Doobs' Grass					
			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					
			Unit = sqm					
			Taking output = 100 sqm					
		(i)	In rows 15 cm apart in either direction					
			a) Labour					
			Mate	day	0.170	582.53	99.03	L-12
			Mazdoor for grassing	day	0.750	529.57	397.18	L-13
			Mazdoor for maintenance for 30 days	day	1.000	529.57	529.57	L-13
			b) Machinery					
			Water tanker6 KL capacity	hour	0.500	819.77	409.89	P&M-060
			c) Material					
			Doob grass	kg	100.000	78.02	7801.62	M-112
			d) Overhead charges @ 10% on (a+b+c)				923.73	
			e) Contractor's profit @ 16% on (a+b+c+d)				1625.76	
			Cost for 100 sqm = a+b+c+d+e				11786.78	
			Rate per sqm= (a+b+c+d+e)/100				117.87	
						say	118.00	
11.2		(ii)	In rows 7.5 cm apart in either direction					
			a) Labour					
			Mate	day	0.220	582.53	128.16	L-12
			Mazdoor for grassing.	day	1.250	529.57	661.96	L-13
			for maintenance for 30 days	day	1.000	529.57	529.57	L-13
			b) Machinery					
			Water tanker6 KL capacity	hour	0.750	819.77	614.83	P&M-060
			c) Material					
			Doob grass	kg	200.000	78.02	15603.25	M-112
			d) Overhead charges @ 10% on (a+b+c)				1753.78	
			e) Contractor's profit @ 16% on (a+b+c+d)				3086.65	
			Cost for 100 sqm = a+b+c+d+e				22378.19	
			Rate per sqm = (a+b+c+d+e)/100				223.78	
						say	224.00	
		Note	In the case of horticulture one mate has been provided for every 10 mazdoors as maintenance of grass and plants require more care.					
11.3	307		Making Lawns including Ploughing and Dragging with 'Swagha' Breaking of Clod					
			Making lawns including ploughing and breaking of clod, removal of rubbish, dressing and supplying doobs grass roots and planting at 15 cm apart, including supplying and spreading of farm yard manure at rate of 0.18 cum per 100 sqm					
			Unit = sqm					
			Taking output = 100 sqm					
			a) Labour					
			Mate	day	0.150	582.53	87.38	L-12
			Mazdoor for preparation of ground	day	0.500	529.57	264.78	L-13
			Mali for fetching doobs grass roots and grassing at 15 cm apart	day	1.000	476.61	476.61	L-09
			b) Machinery					
			Water tanker6 KL capacity	hour	0.500	819.77	409.89	P&M-060

			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)					
			Tractor with tiller	hour	0.010	357.99	3.58	P&M-053
			c) Material					
			Supply of farm yard manure at site of work	cum	0.180	154.69	27.84	M-167
			Fine grass	kg	100.000	100.88	10088.31	M-113
			d) Overhead charges @ 10% on (a+b+c)				1135.84	
			e) Contractor's profit @ 16% on (a+b+c+d)				1999.08	
			Cost for 100 sqm = a+b+c+d+e				14493.31	
			Rate per sqm = (a+b+c+d+e)/100				144.93	
						say	145.00	
11.4	307		Maintenance of Lawns or Turfing of Slopes					
			Maintenance of lawns or Turfing of slopes (rough grassing) for a period of one year including watering etc					
			Unit = sqm					
			Taking output = 100 sqm					
			a) Labour					
			Mali	day	10.000	476.61	4766.13	L-09
			b) Machinery					
			Water tanker 6 KL capacity	hour	15.000	819.77	12296.61	P&M-060
			c) Material					
			Cost of water	KL	90.000	529.57	47661.29	M-189
			d) Overhead charges @ 10% on (a+b+c)				6472.40	
			e) Contractor's profit @ 16% on (a+b+c+d)				11391.43	
			Cost for 100 sqm = a+b+c+d+e				82587.87	
			Rate per sqm = (a+b+c+d+e)/100				825.88	
						say	826.00	
11.5	307		Turfing Lawns with Fine Grassing including Ploughing, Dressing					
			Turfing lawns with fine grassing including ploughing, dressing including breaking of clods, removal of rubbish, dressing and supplying doobs grass roots at 10 cm apart, including supplying and spreading of farm yard manure at rate of 0.6 cum per 100 sqm					
			Unit = sqm					
			Taking output = 100 sqm					
			a) Labour					
			Mate	day	0.250	582.53	145.63	L-12
			Mazdoor for preparation of ground	day	1.000	529.57	529.57	L-13
			Mali for fetching doobs grass roots hedges and grassing at 10 cm apart	day	1.500	476.61	714.92	L-09
			b) Machinery					
			Water tanker 6 KL capacity	hour	0.500	819.77	409.89	P&M-060
			Tractor with tiller	hour	0.010	357.99	3.58	P&M-053
			c) Material					
			Supply of farm yard manure at site of work @ 0.6 cum per 100 sqm	cum	0.600	154.69	92.81	M-167
			Fine grass	kg	100.000	100.88	10088.31	M-113
			d) Overhead charges @ 10% on (a+b+c)				1198.47	
			e) Contractor's profit @ 16% on (a+b+c+d)				2109.31	
			Cost for 100 sqm = a+b+c+d+e				15292.49	
			Rate per sqm = (a+b+c+d+e)/100				152.92	
						say	153.00	
11.6	307		Maintenance of Lawns with Fine Grassing for the First Year					
			Maintenance of lawns with fine grassing for the first year including watering etc					
			Unit = sqm					
			Taking output = 100 sqm					
			a) Labour					
			Mali	day	10.000	476.61	4766.13	L-09
			b) Machinery					
			Water tanker 6 KL capacity	hour	20.000	819.77	16395.48	P&M-060
			c) Material					

			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)					
			Cost of water	KL	60.000	529.57	31774.19	M-189
			d) Overhead charges @ 10% on (a+b+c)				5293.58	
			e) Contractor's profit @ 16% on (a+b+c+d)				9316.70	
			Cost for 100 sqm = a+b+c+d+e				67546.09	
			Rate per sqm = (a+b+c+d+e)/100				675.46	
						say	<u>675.00</u>	
11.7	307		Planting and Maintaining of Permanent Hedges					
		(a)	Planting permanent hedges including digging of trenches					
			Planting permanent hedges including digging of trenches, 60 cm wide and 45 cm deep, refilling the excavated earth mixed with farmyard manure, supplied at the rate of 4.65 cum per 100 metres and supplying and planting hedge plants at 30 cm apart					
			Unit = Running metre					
			Taking output = 100metre					
			a) Labour					
			Mate	day	1.400	582.53	815.54	L-12
			Mazdoor for digging of trench 60 cm wide and 45 cm deep	day	10.000	529.57	5295.70	L-13
			Mazdoor for refilling the excavated earth mixed with cow dung, preparation of ground and digging of plant, from the nursery carriage to site and planting in position	day	4.000	529.57	2118.28	L-13
			b) Machinery					
			Water tanker 6 KL capacity	hour	0.500	819.77	409.89	P&M-060
			c) Material					
			Cost of hedge plants 2 rows at 30 cm apart	each	2x340	14.80	10061.40	M-116
			Supply of farm yard manure at site of work	cum	4.670	154.69	722.39	M-167
			Pesticide	kg	0.250	591.85	147.96	M-136
			Cost of water	KL	3.000	529.57	1588.71	M-189
			d) Overhead charges @ 10% on (a+b+c)				2115.99	
			e) Contractor's profit @ 16% on (a+b+c+d)				3724.14	
			Cost for 100 metres = a+b+c+d+e				26999.99	
			Rate per metre = a+b+c+d+e)/100				270.00	
						say	<u>270.00</u>	
		(b)	Maintenance of hedge for one year					
			Unit = Running metre					
			Taking output = 100 m					
			a) Labour					
			Mate	day	3.000	582.53	1747.58	L-12
			Mazdoor	day	30.000	529.57	15887.10	L-13
			b) Machinery					
			Water tanker 6 KL capacity	hour	5.000	819.77	4098.87	P&M-060
			c) Material					
			Manure sludge/Farm yard manure	cum	2.000	154.69	309.37	M-167
			Pesticide	kg	0.500	591.85	295.92	M-136
			Cost of water	KL	30.000	529.57	15887.10	M-189
			Cost of hedge plants @ 10 per cent casualty	each	68.000	14.80	1006.14	M-116
			d) Overhead charges @ 10% on (a+b+c)				3923.21	
			e) Contractor's profit @ 16% on (a+b+c+d)				6904.85	
			Cost for 100 metres = a+b+c+d+e				50060.14	
			Rate per metre = a+b+c+d+e)/100				500.60	
						say	<u>501.00</u>	
11.8	307		Planting and Maintaining of Flowering Plants and Shrubs					
		(a)	Planting flowering plants and shrubs in central verge					
			Unit = Running metres 200 plants and 800 shrubs in two rows in one km length of road where width of verge is 3m and above.					
			Taking output = 1000 metres					

			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)					
			a) Labour					
			Mate	day	1.200	582.53	699.03	L-12
			Mazdoor	day	12.000	529.57	6354.84	L-13
			b) Machinery					
			Water tanker 6 KL capacity	hour	6.000	819.77	4918.65	P&M-060
			c) Material					
			Plants	each	200.000	134.51	26902.15	M-100
			Shrubs	each	800.000	12.11	9684.77	M-166
			Manure sludge/Farm yard manure	cum	63.640	154.69	9844.30	M-167
			Pesticide	kg	0.500	591.85	295.92	M-136
			Cost of water	KL	36.000	529.57	19064.52	M-189
			d) Overhead charges @ 10% on (a+b+c)				7776.42	
			e) Contractor's profit @ 16% on (a+b+c+d)				13686.50	
			Rate per Km = (a+b+c+d+e)				99227.10	
						say	99227.00	
11.8		(b)	Maintenance of flowering plants and shrubs in central verge for one year					
			<i>Unit = km</i>					
			<i>Taking output = one km</i>					
			a) Labour					
			Mate	day	36.000	582.53	20970.97	L-12
			Mazdoor	day	365.000	529.57	193293.01	L-13
			b) Machinery					
			Water tanker 6 KL capacity	hour	90.000	819.77	73779.68	P&M-060
			c) Material					
			Manure Sludge / farm yard manure at site	cum	10.000	154.69	1546.87	M-167
			Cost of water	KL	180.000	529.57	95322.58	M-189
			Replacement of casualties @ 10 per cent					
			Plants	each	20.000	134.51	2690.22	M-100
			Shrubs	each	80.000	12.11	968.48	M-166
			Pesticides	kg	1.500	591.85	887.77	M-136
			d) Overhead charges @ 10% on (a+b+c)				38945.96	
			e) Contractor's profit @ 16% on (a+b+c+d)				68544.88	
			Rate per Km for one year = (a+b+c+d+e)				496950.42	
						say	496950.00	
11.9	307		Planting of Trees and their Maintenance for one Year					
			Planting of trees by the road side (Avenue trees) in 0.60 m dia holes, 1 m deep dug in the ground, mixing the soil with decayed farm yard/sludge manure, planting the saplings, backfilling the trench, watering, fixing the tree guard and maintaining the plants for one year					
			<i>Unit = Each</i>					
			<i>Taking output = 10 trees</i>					
			a) Labour					
			Mate	day	1.700	582.53	990.30	L-12
			Mazdoor for planting	day	2.000	529.57	1059.14	L-13
			Mazdoor for maintenance for one year	day	15.000	529.57	7943.55	L-13
			b) Machinery					
			Water tanker 6 KL capacity	hour	2.000	819.77	1639.55	P&M-060
			c) Material					
			Sapling 2 m high 25 mm dia	each	10.000	7.40	73.98	M-160
			Farm yard manure	cum	0.940	154.69	145.41	M-167
			Pesticide	kg	0.500	591.85	295.92	M-136
			Cost of water	KL	12.000	529.57	6354.84	M-189
			d) Overhead charges @ 10% on (a+b+c)				1850.27	
			e) Contractor's profit @ 16% on (a+b+c+d)				3256.47	
			Cost for 10 trees = a+b+c+d+e				23609.42	
			Rate per trees = (a+b+c+d+e)/10				2360.94	
						say	2361.00	

			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)					
11.10	308		Renovation Lawns including, Weeding, Forking the Ground, Top Dressing with Forked Soil					
			Renovation lawns including, weeding, forking the ground, top dressing with forked soil, watering and maintenance the lawns, for 30 days or more, till the grass forms a thick lawn, free from weeds, and fit for moving and disposal of rubbish as directed, including supplying good earth, if needed but excluding the cost of well decayed farm yard manure					
			Unit = sqm					
			Taking output = 100 sqm					
			a) Labour					
			Mate	day	0.120	582.53	69.90	L-12
			Mazdoor	day	3.000	529.57	1588.71	L-13
			b) Machinery					
			Water tanker 6 KL capacity	hour	0.500	819.77	409.89	P&M-060
			c) Material					
			Cost of water	KL	3.000	529.57	1588.71	M-189
			d) Overhead charges @ 10% on (a+b+c)				365.72	
			e) Contractor's profit @ 16% on (a+b+c+d)				643.67	
			Cost for 100 sqm = a+b+c+d+e				4666.60	
			Rate per sqm = (a+b+c+d+e)				46.67	
						say	47.00	
11.11	308.2		Supply at Site Well Decayed Farm Yard Manure					
			Supply at site of work well decayed farm yard manure, from any available source, approved by the engineer in charge including screening and stacking					
			Unit = cum					
			Taking output = one cum					
			a) Material					
			a) Cost of well decayed farm yard manure duly screened, loading, carriage, unloading and stacking at site	cum	1.000	154.69	154.69	M-167
			b) Overhead charges @ 10% on (a)				15.47	
			c) Contractor's profit @ 16% on (a+b)				27.22	
			Rate per cum = (a+b+c)				197.38	
							197.00	
11.12	308.20		Supply at Site of Work/ Store-Deoiled Neem Cake					
			Supply at site of work/ store-deoiled neem cake duly packed in used gunny bags					
			Unit = quintal					
			Taking output = one quintal					
			a) Cost, carriage, loading, unloading and stacking in store/site	quintal	1.000			
			b) Overheads @ per cent on (a)					
			c) Contractors profit @ per cent on (a+b)					
			Rate per quintal = a+b+c					
11.13	308.2		Supplying Sludge					
			Supplying sludge duly stacked at site/ store					
			Unit = cum					
			Taking output = one cum					
			a) Cost of sludge including carriage, loading, unloading and stacking at site	cum	1.000			
			b) Overheads @ per cent on (a)					
			c) Contractors profit @ per cent on (a+b)					
			Rate per cum = a+b+c					
11.14		New	Half Brick Circular Tree Guard, in 2nd Class Brick, internal diameter 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground					

			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)					
			Half brick circular tree guard, in 2nd class brick, internal diameter 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground, bottom two courses laid dry, and top three courses in cement mortar 1:6 (1 cement 6 sand) and the intermediate courses being in dry honey comb masonry as per design complete					
			Unit = Each					
			Taking output = one tree guard					
			a) Labour					
			Mate	day	0.050	582.53	29.13	L-12
			Mason	day	0.250	635.48	158.87	L-11
			Mazdoor	day	0.250	529.57	132.39	L-13
			b) Material					
			Brick 2nd class including carriage	each	230.000	19.66	4522.88	M-079
			Cement mortar 1:6	cum	0.025	10938.00	273.45	Item 12.6 (D)
			c) Overhead charges @ 10% on (a+b)				511.67	
			d) Contractor's profit @ 16% on (a+b+c)				900.54	
			Rate per tree Guard = a+b+c+d				6528.93	
						say	6529.00	
11.15	New		Edging with 2nd Class Bricks, Laid Dry Lengthwise					
			Edging with 2nd class bricks, laid dry lengthwise, including excavation, refilling, consolidation, with a hand packing and spreading nearly surplus earth within a lead of 50 metres					
			Unit = Metre					
			Taking output= 10 metres					
			a) Labour					
			Mate	day	0.002	582.53	1.17	L-12
			Mason	day	0.050	635.48	31.77	L-11
			Mazdoor	day	0.050	529.57	26.48	L-13
			b) Material					
			Brick 2nd class including carriage	each	50.000	19.66	983.23	M-079
			c) Overhead charges @ 10% on (a+b)				104.27	
			d) Contractor's profit @ 16% on (a+b+c)				183.51	
			Cost for 10 metre = a+b+c+d				1330.42	
			Rate per metre = (a+b+c+d)/10				133.04	
						say	133.00	
11.16	New		Making Tree Guard 53 cm dia and 1.3 m High as per Design from Empty Bitumen Drums					
			Making tree guard 53 cm dia and 1.3 m high as per design from empty bitumen drum, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets, complete in all respect					
			Unit = Each					
			Taking output = one tree guard					
			a) Labour					
			Mate	day	0.020	582.53	11.65	L-12
			Blacksmith	day	0.150	635.48	95.32	L-02
			Mazdoor	day	0.070	529.57	37.07	L-13
			b) Material					
			Empty bitumen drum	each	1.000	161.41	161.41	M-172
			MS sheet 50 x 0.5 mm	kg	0.650	60.67	39.43	M-179 /1000
			Rivets 6 mm dia and 10 mm in length	each	22.000	340.31	7486.87	M-158
			d) Overhead charges @ 10% on (a+b+c)				783.18	
			e) Contractor's profit @ 16% on (a+b+c+d)				1378.39	
			Rate for each tree guard = a+b+c+d				9993.32	
						say	9993.00	
11.17	New		Making Tree Guard 53 cm dia and 2 Metre High as per Design from Empty Bitumen Drums					

			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)					
			Making tree guard 53 cm dia and 2 metres high as per design from empty bitumen drums, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing and fixing four legs 40 cm long of 30 x 3 mm MS riveted to tree guard and providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets complete in all respects					
			Unit = Each					
			Taking output = one tree guard					
			a) Labour					
			Mate		0.040	582.53	23.30	L-12
			Blacksmith	day	0.200	635.48	127.10	L-02
			Mazdoor		0.200	529.57	105.91	L-13
			b) Material					
			Empty bitumen drum	each	1.500	161.41	242.12	M-172
			MS sheet 50 x 0.5 mm	kg	0.650	60.67	39.43	M-179 /1000
			Rivets 6 mm dia and 10 mm in length	each	50.000	340.31	17015.61	M-158
			MS plate 30 x 3 mm	kg	1.300	60.67	78.87	M-179 /1000
			c) Overhead charges @ 10% on (a+b)				1763.23	
			d) Contractor's profit @ 16% on (a+b+c)				3103.29	
			Rate for each tree guard = a+b+c+d				22498.87	
						say	22499.00	
11.18		New	Wrought Iron and Mild Steel Welded Work					
			Wrought iron and mild steel welded work (using angles, square bars, tees and channel grills, grating frames, gates and tree guards of any size and design etc. including cost of screens and welding rods or bolts and nuts complete fixed in position but without the cost of excavation and concrete for fixing which will be paid separately					
			Unit = quintal					
			Taking output = one quintal					
			a) Labour					
			Mate	day	0.450	582.53	262.14	L-12
			Blacksmith/ welder for cutting to design and shape and jointing	day	2.000	635.48	1270.97	L-02
			Mazdoor for fixing and helper for Blacksmith/welder	day	2.500	529.57	1323.92	L-13
			b) Material					
			Angle, tees, channels etc	quintal	1.050	6066.71	6370.05	M-179 /10
			Deduct the cost of scrap	quintal	0.050	(2022.24)	(101.11)	M-179/10/3
			Add 5 per cent of cost of material for welding rods and other welding accessories				313.45	
			c) Overhead charges @ 10% on (a+b)				943.94	
			d) Contractor's profit @ 16% on (a+b+c)				1661.34	
			Rate per quintal = a+b+c+d				12044.69	
						say	12045.00	
11.19		New	Tree Guard with MS Iron					
			Providing and fixing MS iron tree guard 60 cm dia and 2 metre high above ground level formed of 4 Nos (25 x 6 mm) and 8 Nos (25 x 3 mm) vertical MS riveted to 3 Nos (25 x 6 mm) iron rings in two halves, bolted together with 8 mm dia and 30 mm long bolts including painting two coats with paint of approved brand over a coat of priming, complete in all respects					
			Unit = Each					
			Taking output = one tree guard					
			a) Labour					
			Mate	day	0.050	582.53	29.13	L-12
			Blacksmith	day	0.250	635.48	158.87	L-02
			Mazdoor	day	0.250	529.57	132.39	L-13
			b) Material					

			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)					
			MS iron 25 x 6 mm	kg	19.200	60.67	1164.81	M-179 /1000
			MS iron 25 x 3 mm	kg	9.600	60.67	582.40	M-179 /1000
			Add 5 per cent of cost of material for riveting, bolting and welding accessories					
			c) Machinery					
			Tractor-trolley	hour	0.040	357.99	14.32	P&M-053
			d) Painting					
			Painting two coats including priming	sqm	1.770	228.70	404.80	Item 8.9
			e) Overhead charges @ 10% on (a+b+c)				208.19	
			f) Contractor's profit @ 16% on (a+b+c+e)				366.42	
			Rate per tree guard =a+b+c+d+e+f				3061.33	
						say	<u>3061.00</u>	
		Note	1 The items of excavation and concreting to be measured and paid separately as per design .					
			2 . Rate of painting may be adopted from the chapter as Traffic signs.					
11.20		New	Tree Guard with MS Angle Iron and Steel Wire					
			Providing and fixing tree guard 0.60 metre square, 2.00 metre high fabricated with MS angle iron 30 x 30 x 3 mm, MS iron 25 x 3 mm and steel wire 3 mm dia welded and fabricated as per design in two halves bolted together					
			Unit = Each					
			Taking output = one					
			a) Labour					
			Mate	day	0.050	582.53	29.13	L-12
			Blacksmith	day	0.250	635.48	158.87	L-02
			Welder	day	0.250	635.48	158.87	L-02
			Mazdoor	day	0.250	529.57	132.39	L-13
			b) Material					
			MS angle 30 x 30 x 3 mm	kg	13.500	60.67	819.01	M-179 /1000
			MS iron 25 x 3 mm	kg	18.000	60.67	1092.01	M-179 /1000
			Steel wire 3 mm dia	kg	6.000	96.85	581.09	M-192
			Add 5 per cent of cost of material for riveting, bolting and welding accessories				124.61	
			c) Machinery					
			Tractor-trolley	hour	0.040	357.99	14.32	P&M-053
			d) Painting					
			Painting two coats including priming	sqm	1.500	228.70	343.05	Item 8.9
			e) Overhead charges @ 10% on (a+b+c)				311.03	
			f) Contractor's profit @ 16% on (a+b+c+e)				547.41	
			Rate per tree guard = a+b+c+d+e+f				4311.78	
						say	<u>4312.00</u>	
11.21		New	Compensatory Afforestation					
			Planting trees as compensatory afforestation at the rate of 290 trees per hectare at a spacing of 6 m by grubbing and leveling the ground upto a depth of 150 mm, digging holes 0.9 m dia, 1 m deep, mixing farm yard/sludge manure with soil, planting of sapling 2 m high with 25 cm dia stem, backfilling the hole and watering					
			Unit = Hectare					
			Taking output = one hectare					
			a) Labour					
			i) Planting					
			Mate	day	2.500	582.53	1456.32	L-12
			Mazdoor	day	25.000	529.57	13239.25	L-13
			ii) For Maintenance for one year					
			Mate	day	5.000	582.53	2912.63	L-12
			Mazdoor	day	50.000	529.57	26478.49	L-13
			b) Machinery					

			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)					
			Dozer 80 HP @ 1000 sqm/hour	hour	10.000	1722.16	17221.61	P&M-015
			Water tanker 6 KL capacity (for planting)	hour	3.000	819.77	2459.32	P&M-060
			Water tanker 6 KL capacity (for maintenance)	hour	25.000	819.77	20494.35	P&M-060
			c) Material					
			Sapling 1 to 1.5 m high 2 cm dia stem	each	290.000	5.92	1716.36	M-160 x 0.8
			Add 10 per cent of sapling	each	29.000	5.92	171.64	M-160 x 0.8
			Decayed farm yard/sludge manure (planting)	cum	60.900	154.69	9420.46	M-167
			Decayed farm yard/sludge manure (maintenance)	cum	4.000	154.69	618.75	M-167
			Pesticides for planting	kg	0.500	591.85	295.92	M-136
			Pesticides for maintenance	kg	1.500	591.85	887.77	M-136
			Cost of water	KL	18.000	529.57	9532.26	M-189
			d) Overhead charges @ 10% on (a+b+c)				10690.51	
			e) Contractor's profit @ 16% on (a+b+c+d)				18815.30	
			Rate per hectare = a+b+c+d+e				136410.96	
						say	<u>136411.00</u>	
		Note	Cost of fencing to be provided as per size of plot and approved design, measured and paid separately					

CHAPTER-12								
FOUNDATIONS								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.1	304		Excavation for Structures					
			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.					
		I	Ordinary soil					
			<i>Unit = cum</i>					
			<i>Taking output = 10 cum</i>					
		A	Manual Means					
		(i)	Depth upto 3 m					
		a)	Labour					
			Mate	day	0.14	582.53	81.55	L-12
			Mazdoor	day	3.50	529.57	1853.49	L-13
		b)	Overhead charges @ 25% on (a)				483.76	
		c)	Contractor's profit @ 16% on (a+b)				387.01	
			Cost for 10 cum = a+b+c				2805.82	
			Rate per cum = (a+b+c)/10				280.58	
						say	281.00	
		Note	1. Cost of dewatering may be added where required upto, 10 per cent of labour cost Assessment for dewatering shall be made as per site conditions.					
			2. The excavated earth can be used partially for backfilling of foundation pit and partly for road work except for marshy soil. Hence cost of disposal has not been added except for marshy soil. This remark is common to all cases of item 12.1 excluding marshy soil.					
			3. The cost of shoring and shuttering, where needed, may be added @ 1 per cent on cost of excavation for open foundation.					
12.1 (I) A		(ii)	Depth 3 m to 6 m					
		a)	Labour					
			Mate/Supervisor	day	0.18	582.53	104.85	L-12
			Mazdoor	day	4.50	529.57	2383.06	L-13
		b)	Overhead charges @ 25% on (a)				621.98	
		c)	Contractor's profit @ 16% on (a+b)				497.58	
			Cost for 10 cum = a+b+c				3607.48	
			Rate per cum = (a+b+c)/10				360.75	
						say	361.00	
		Note	Cost of dewatering may be added where required upto 15 per cent of labour cost. Assessment for dewatering shall be done as per actual ground conditions.					
12.1 (I) A		(iii)	Depth above 6 m					
		a)	Labour					
			Mate/Supervisor	day	0.24	582.53	139.81	L-12
			Mazdoor	day	6.00	529.57	3177.42	L-13
		b)	Overhead charges @ 25% on (a)				829.31	
		c)	Contractor's profit @ 16% on (a+b)				663.45	
			Cost for 10 cum = a+b+c				4809.98	
			Rate per cum = (a+b+c)/10				481.00	
						say	481.00	
		Note	1. Cost of dewatering may be added where required upto 20 per cent of labour cost. Assessment for dewatering shall be made as per site conditions..					
12.1 (I)		B	Mechanical Means					
		(i)	Depth upto 3 m					
			<i>Unit = cum</i>					
			<i>Taking output = 240 cum</i>					
		a)	Labour					
			Mate	day	0.32	582.53	186.41	L-12
			Mazdoor	day	8.00	529.57	4236.56	L-13
		b)	Machinery					
			Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1444.67	8668.00	P&M-026
		c)	Overhead charges @ 25% on (a+b)				3272.74	
		d)	Contractor's profit @ 16% on (a+b+c)				2618.19	
			Cost for 240 cum = a+b+c+d				18981.90	
			Rate per cum = (a+b+c+d)/240				79.09	
						say	79.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Note	Cost of dewatering upto 5 per cent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions..					
12.1 (I) B		(ii)	Depth 3 m to 6 m					
			Unit = cum					
			Taking output = 210 cum					
		a) Labour						
		Mate		day	0.32	582.53	186.41	L-12
		Mazdoor		day	8.00	529.57	4236.56	L-13
		b) Machinery						
		Hydraulic excavator 1.0 cum bucket capacity		hour	6.00	1444.67	8668.00	P&M-026
		c) Overhead charges @ 25% on (a+b)					3272.74	
		d) Contractor's profit @ 16% on (a+b+c)					2618.19	
		Cost for 210 cum = a+b+c+d					18981.90	
		Rate per cum = (a+b+c+d)/210					90.39	
						say	90.00	
		Note	Cost of dewatering upto 7.5 per cent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions..					
12.1 (I) B		(iii)	Depth above 6m					
			Unit = cum					
			Taking output = 180 cum					
		a) Labour						
		Mate		day	0.40	582.53	233.01	L-12
		Mazdoor		day	10.00	529.57	5295.70	L-13
		b) Machinery						
		Hydraulic excavator 1.0 cum bucket capacity		hour	6.00	1444.67	8668.00	P&M-026
		c) Overhead charges @ 25% on (a+b)					3549.18	
		d) Contractor's profit @ 16% on (a+b+c)					2839.34	
		Cost for 180 cum = a+b+c+d					20585.23	
		Rate per cum = (a+b+c+d)/180					114.36	
						say	114.00	
		Note	1. Cost of dewatering upto 10 per cent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions..					
			2. Labour provided for excavation by mechanical means includes that required for trimming of bottom and side slopes.					
12.1		II	Ordinary Rock (not requiring blasting)					
		A	Manual Means					
		(i)	Depth upto 3 m					
			Unit = cum					
			Taking output = 10 cum					
		a) Labour						
		Mate		day	0.20	582.53	116.51	L-12
		Mazdoor		day	5.00	529.57	2647.85	L-13
		b) Overhead charges @ 25% on (a)					691.09	
		c) Contractor's profit @ 16% on (a+b)					552.87	
		Cost for 10 cum = a+b+c					4008.31	
		Rate per cum = (a+b+c)/10					400.83	
						say	401.00	
		Note	Cost of dewatering upto 10 per cent of labour cost may be added, where required. Assessment for dewatering shall be made as per site conditions..					
12.1(II)		B	Mechanical Means					
			Unit = cum					
			Taking output = 180 cum					
		a) Labour						
		Mate		day	0.24	582.53	139.81	L-12
		Mazdoor		day	6.00	529.57	3177.42	L-13
		b) Machinery						

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1444.67	8668.00	P&M-026
		c) Overhead charges @ 25% on (a+b)				2996.31	
		d) Contractor's profit @ 16% on (a+b+c)				2397.05	
		Cost for 180 cum = a+b+c+d				17378.58	
		Rate per cum = (a+b+c+d)/180				96.55	
					say	<u>97.00</u>	
	Note	1. Cost of dewatering upto 10 per cent of (a+b), may be added, where required Assessment for dewatering shall be made as per site conditions.					
		2. In case of rock, foundation beyond 3 m is not dug and hence not included.					
12.1	III	Hard Rock (requiring blasting)					
	A	Manual Means					
		Unit = cum					
		Taking output = 10 cum					
		a) Labour					
		Mate	day	0.35	582.53	203.88	L-12
		Driller	day	0.50	635.48	317.74	L-06
		Blaster	day	0.25	635.48	158.87	L-03
		Mazdoor	day	8.00	529.57	4236.56	L-13
		b) Machinery					
		Air Compressor 250 cfm with 2 jack hammer for drilling.	hour	1.00	887.56	887.56	P&M-001
		c) Material					
		Blasting Material	kg	3.50	406.76	1423.66	M-104
		Detonator electric	each	14.00	2.69	37.66	M-094/100
		d) Overhead charges @ 25% on (a+b+c)				1816.49	
		e) Contractor's profit @ 16% on (a+b+c+d)				1453.19	
		Cost for 10 cum = a+b+c+d+e				10535.61	
		Rate per cum = (a+b+c+d+e)/10				1053.56	
					say	<u>1054.00</u>	
	Note	Cost of dewatering @ 10 per cent of (a+b) may be added, where required Assessment for dewatering shall be made as per site conditions.					
12.1	IV	Hard Rock (blasting prohibited)					
		Unit = cum					
		Taking output = 10 cum					
	A	Mechanical Means					
		a) Labour					
		Mate	day	0.20	582.53	116.51	L-12
		Mazdoor	day	5.00	529.57	2647.85	L-13
		b) Machinery					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker	hour	6.00	887.56	5325.35	P&M-001
		c) Overhead charges @ 25% on (a+b)				2022.43	
		d) Contractor's profit @ 16% on (a+b+c)				1617.94	
		Cost for 10 cum = a+b+c+d				11730.08	
		Rate per cum = (a+b+c+d)/10				1173.01	
					say	<u>1173.00</u>	
	Note	1. Cost of dewatering upto 10 per cent of (a+b), may be added, where required Assessment for dewatering shall be made as per site conditions.					
		2. In case of rock, foundation beyond 3 m is not dug and hence not included.					
12.1	V	Marshy Soil					
		Unit = cum					
		Taking output = 10 cum					
		Depth upto 3 m					
	A	Manual means					
		a) Labour					
		Mate/Supervisor	day	0.40	582.53	233.01	L-12
		Mazdoor	day	10.00	529.57	5295.70	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Machinery					
		Tractor-trolley for removal.	hour	2.67	357.99	955.83	P&M-053
		c) Overhead charges @ 25% on (a+b)				1621.14	
		d) Contractor's profit @ 16% on (a+b+c)				1296.91	
		Cost for 10 cum = a+b+c+d				9402.58	
		Rate per cum = (a+b+c+d)/ 10				940.26	
					say	<u>940.00</u>	
		Note 1. Cost of dewatering @ 30 per cent of (a), may be added, where required Assessment for dewatering shall be made as per site conditions.					
		2. Shoring & strutting 15 per cent of (a), where required may be added					
		3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item 12.1 (i) to (iv) for ordinary soil					
12.1 (V)	B	Mechanical Means					
		a) Labour					
		Mate	day	0.08	582.53	46.60	L-12
		Mazdoor for dressing sides, bottom and backfilling	day	2.00	529.57	1059.14	L-13
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.17	1444.67	245.59	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.45	1006.18	452.78	P&M-048
		c) Overhead charges @ 25% on (a+b)				451.03	
		d) Contractor's profit @ 16% on (a+b+c)				360.82	
		Cost for 10 cum = a+b+c+d				2615.97	
		Rate per cum = (a+b+c+d)/10				261.60	
					say	<u>262.00</u>	
		Note 1. Cost of dewatering @ 20 per cent of (a+b) may be added, where required					
		2. Shoring & strutting @ 10 per cent of (a+b), where required may be added					
		3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item 12.1 (i) to (iv) for ordinary soil					
	VI	Back Filling in Marshy Foundation Pits					
		Unit : Cum					
		Taking Output : 6 cum					
		a) Labour					
		Mate	day	0.12	582.53	69.90	L-12
		Mazdoor for dressing sides, bottom and backfilling	day	3.00	529.57	1588.71	L-13
		b) Machinery					
		Tractor-trolley for transportation	hour	2.00	357.99	715.98	P&M-053
		c) Overhead charges @ 25% on (a+b)				593.65	
		d) Contractor's profit @ 16% on (a+b+c)				474.92	
		Cost for 6 cum = a+b+c+d				3443.16	
		Rate per cum = (a+b+c+d)/6				573.86	
					say	<u>574.00</u>	
12.2	304	Filling Annular Space Around Footing in Rock					
		Unit = cum					
		Taking out put = 1 cum					
		Lean cement concrete 1:3:6 nominal mix. Rate may be taken as per item 12.4.					
12.3	304	Sand Filling in Foundation Trenches as per Drawing & Technical Specification					
		Unit = cum					
		Taking output = 1 cum					
		a) Labour					
		Mate	day	0.01	582.53	5.83	L-12
		Mazdoor	day	0.30	529.57	158.87	L-13
		b) Material					
		Sand (assuming 20 per cent voids)	cum	1.20	6624.31	7949.18	M-006

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Overhead charges @ 25% on (a+b)				2028.47	
		d) Contractor's profit @ 16% on (a+b+c)				1622.77	
		Rate per cum = a+b+c+d				11765.11	
					say	<u>11765.00</u>	
12.4	2100	PCC 1:3:6 in Foundation					
		Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.					
		Unit = cum					
		Taking output = 15 cum					
		a) Labour					
		Mate	day	0.64	582.53	372.82	L-12
		Mason	day	1.00	635.48	635.48	L-11
		Mazdoor	day	15.00	529.57	7943.55	L-13
		b) Material					
		40 mm Aggregate	cum	13.50	1919.16	25908.68	M-055
		coarse Sand	cum	6.75	6977.61	47098.89	M-005
		cement	tonne	3.45	7169.28	24734.02	M-081
		Cost of water	KL	18.00	529.57	9532.26	M-189
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
		Water tanker 6 KL capacity	hour	2.00	819.77	1639.55	P&M-060
		d) Overhead charges @ 25% on (a+b+c)				31643.64	
		e) Contractor's profit @ 16% on (a+b+c+d)				25314.91	
		Cost for 15 cum = a+b+c+d+e				183533.09	
		Rate per cum = (a+b+c+d+e)/15				12235.54	
					say	<u>12236.00</u>	
		Note					Vibrator is a part of minor T & P which is already included in overhead charges of the contractor.
12.5	1300	Brick Masonry Work in Cement Mortar 1:3 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications.					
		Unit = cum					
		Taking output = 5 cum					
		a) Material					
		Bricks 1st class	each	2500.00	19.66	49161.74	M-079
		Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	1.20	11830.00	14196.00	Item 12.6 (A)
		b) Labour					
		Mate	day	0.48	582.53	279.61	L-12
		Mason	day	4.00	635.48	2541.94	L-11
		Mazdoor	day	8.00	529.57	4236.56	L-13
		c) Overhead charges @ 25% on (a+b)				17603.96	
		d) Contractor's profit @ 16% on (a+b+c)				14083.17	
		Cost for 5 cum = a+b+c+d				102102.98	
		Rate per cum (a+b+c+d)/5				20420.60	
					say	<u>20421.00</u>	
12.6	Sub-analysis	(A) Cement Mortar 1:3 (1 cement : 3 sand)					
		Unit = 1 cum					
		Taking output = 1 cum					
		a) Materials					
		Cement	tonne	0.51	7169.28	3656.33	M-081
		Sand	cum	1.05	6977.61	7326.49	M-005
		b) Labour					
		Mate	day	0.04	582.53	23.30	L-12
		Mazdoor	day	0.90	529.57	476.61	L-13

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Total Material and Labour = (a+b)			say	11483.00	
	Sub-analysis (Addl.)	(B)	Cement Mortar 1:2 (1 cement : 2 sand)					
			Unit = 1 cum					
			Taking output = 1 cum					
			a) Materials					
			Cement	tonne	0.67	7169.28	4817.76	M-081
			Sand	cum	0.93	6977.61	6489.18	M-005
			b) Labour					
			Mate	day	0.04	582.53	23.30	L-12
			Mazdoor	day	0.90	529.57	476.61	L-13
			Total Material and Labour = (a+b)			say	11807.00	
	Sub-analysis (Addl.)	(C)	Cement Mortar 1:4 (1 cement : 4 sand)					
			Unit = 1 cum					
			Taking output = 1 cum					
			a) Materials					
			Cement	tonne	0.40	7169.28	2890.65	M-081
			Sand	cum	1.12	6977.61	7814.93	M-005
			b) Labour					
			Mate	day	0.04	582.53	23.30	L-12
			Mazdoor	day	0.90	529.57	476.61	L-13
			Total Material and Labour = (a+b)			say	11205.00	
	Sub-analysis (Addl.)	(D)	Cement Mortar 1:6 (1 cement : 6 sand)					
			Unit = 1 cum					
			Taking output = 1 cum					
			a) Materials					
			Cement	tonne	0.29	7169.28	2064.75	M-081
			Sand	cum	1.34	6977.61	9330.07	M-005
			b) Labour					
			Mate	day	0.04	582.53	23.30	L-12
			Mazdoor	day	0.90	529.57	476.61	L-13
			Total Material and Labour = (a+b)			say	11895.00	
12.7	1400		Stone Masonry Work in Cement Mortar 1:3 in Foundation complete as per Drawing and Technical Specifications.					
			Unit = cum					
			Taking output = 5 cum					
	1405.4	(A)	Square Rubble Coursed Rubble Masonry (first sort)					
			a) Material					
			Stone	cum	5.50	2045.46	11250.05	M-169
			Through and bond stone	each	35.00	45.45	1590.92	M-182
			(35 no. x 0.24m x 0.24m x 0.39m = 0.79 cu.m)					
			Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	1.50	11830.00	17745.00	Item 12.6 (A)
			b) Labour					
			Mate	day	0.66	582.53	384.47	L-12
			Mason	day	7.50	635.48	4766.13	L-11
			Mazdoor	day	9.00	529.57	4766.13	L-13
			c) Overhead charges @ 25% on (a+b)				10125.67	
			d) Contractor's profit @ 16% on (a+b+c)				8100.54	
			Cost for 5 cum = a+b+c+d				58728.90	
			Rate per cum (a+b+c+d)/5				11745.78	
						say	11746.00	
	1405.3	(B)	Random Rubble Masonry					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		(coursed/uncoursed)					
		Unit = cum					
		Taking output = 5 cum					
		a) Material					
		Stone	cum	5.50	1297.45	7135.95	M-148
		Through and bond stone	each	35.00	45.45	1590.92	M-182
		(35nos.x0.24mx0.24mx0.39m = 0.79 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	1.55	11830.00	18336.50	Item 12.6 (A)
		b) Labour					
		Mate	day	0.62	582.53	361.17	L-12
		Mason	day	6.00	635.48	3812.90	L-11
		Mazdoor	day	9.00	529.57	4766.13	L-13
		c) Overhead charges @ 25% on (a+b)				9000.89	
		d) Contractor's profit @ 16% on (a+b+c)				7200.71	
		Cost for 5 cum = a+b+c+d				52205.18	
		Rate per cum (a+b+c+d)/5				10441.04	
					say	10441.00	
		Note The labour already considered in cement mortar has been taken into account while proposing labour for masonry works.					
12.8	1500, 1700 & 2100	Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.					
		A PCC Grade M15					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Cement	tonne	4.13	7169.28	29609.13	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		40 mm Aggregate	cum	8.10	1919.16	15545.21	M-055
		20 mm Aggregate	cum	4.05	2372.47	9608.52	M-053
		10 mm Aggregate	cum	1.35	2156.41	2911.15	M-051
		b) Labour					
		Mate	day	0.86	582.53	500.97	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 63 KVA	hour	6.00	379.17	2275.03	P&M-019
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		8090.00			
		d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery				4853.98	
		e) Overhead charges @ 25% on (a+b+c+d)				31550.87	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				25240.69	
		Cost for 15 cum = a+b+c+d+e+f				182995.02	
		Rate per cum = (a+b+c+d+e+f)/15				12199.67	
					say	12200.00	
		Note Needle Vibrator is an item of minor T & P which is already included in overhead charges. Hence not added in rate analysis of cement concrete works.					
12.8		B PCC Grade M20					
		Unit : cum					
		Taking output = 15 cum					
		a) Material					
		Cement	tonne	5.16	7169.28	36993.48	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		40 mm Aggregate	cum	5.40	1919.16	10363.47	M-055
		20 mm Aggregate	cum	5.40	2372.47	12811.35	M-053

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		10 mm Aggregate	cum	2.70	2156.41	5822.30	M-051
		b) Labour					
		Mate	day	0.86	582.53	500.97	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		8923.00			
		d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery				5353.78	
		e) Overhead charges @ 25% on (a+b+c+d)				34799.55	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				27839.64	
		Cost for 15 cum = a+b+c+d+e+f				201837.36	
		Rate per cum = (a+b+c+d+e+f)/15				13455.82	
					say	<u>13456.00</u>	
12.8	C	RCC Grade M20					
	Case I	Using Concrete Mixer					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Cement	tonne	5.21	7169.28	37351.95	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
		10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
		b) Labour					
		Mate	day	0.86	582.53	500.97	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9072.00			
		d) Formwork @ 4 per cent on (a+b+c)				5442.70	
		e) Overhead charges @ 25% on (a+b+c+d)				35377.52	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				28302.01	
		Cost for 15 cum = a+b+c+d+e+f				205189.61	
		Rate per cum = (a+b+c+d+e+f)/15				13679.31	
					say	<u>13679.00</u>	
12.8 C	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Unit : cum					
		Taking Output = 120 cum					
		a) Material					
		Cement	tonne	41.66	7169.28	298672.20	M-081
		Coarse Sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		b) Labour					
		Mate	day	0.84	582.53	489.32	L-12
		Mason	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	18.00	529.57	9532.26	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Lead beyond 1 km, L-lead in km	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
		Concrete Pump	hour	6	409.89	2459.32	P&M-007
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		6657.00			
		d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery				31952.13	
		e) Overhead charges @ 25% on (a+b+c+d)				207688.84	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				166151.07	
		Cost for 120 cum = a+b+c+d+e+f				1204595.26	
		Rate per cum = (a+b+c+d+e+f)/120				10038.29	
					say	10038.00	
12.8	D	PCC Grade M25					
	Case I	Using Concrete Mixer					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Cement	tonne	5.99	7169.28	42943.99	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		40 mm Aggregate	cum	5.40	1919.16	10363.47	M-055
		20 mm Aggregate	cum	5.40	2372.47	12811.35	M-053
		10 mm Aggregate	cum	2.70	2156.41	5822.30	M-051
		b) Labour					
		Mate	day	0.86	582.53	500.97	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9320.00			
		d) Formwork @ 3.75 per cent of (a+b+c)				5242.31	
		e) Overhead charges @ 25% on (a+b+c+d)				36259.30	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				29007.44	
		Cost for 15 cum = a+b+c+d+e+f				210303.96	
		Rate per cum = (a+b+c+d+e+f)/15				14020.26	
					say	14020.00	
12.8 D	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Unit : cum					
		Taking Output = 120 cum					
		a) Material					
		Cement	tonne	47.95	7169.28	343766.98	M-081
		Coarse sand	cum	54.00	1297.45	70062.10	M-004
		40 mm Aggregate	cum	43.20	2111.08	91198.54	M-055
		20 mm Aggregate	cum	43.20	2609.72	112739.92	M-053
		10 mm Aggregate	cum	21.60	2372.05	51236.27	M-051
		b) Labour					
		Mate	day	0.84	582.53	489.32	L-12
		Mason	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	18.00	529.57	9532.26	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
		Concrete Pump	hour	6	409.89	2459.32	P&M-007

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		6896.00			
		d) Formwork @ 3.75 per cent of cost of concrete i.e. cost of material, labour and machinery				31030.89	
		e) Overhead charges @ 25% on (a+b+c+d)				214630.30	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				171704.24	
		cost of 120 cum = a+b+c+d+e+f				1244855.73	
		Rate per cum = (a+b+c+d+e+f)/120				10373.80	
					say	10374.00	
12.8	E	RCC Grade M25					
	Case I	Using Concrete Mixer					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Cement	tonne	6.05	7169.28	43374.14	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
		10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
		b) Labour					
		Mate	day	0.86	582.53	500.97	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9473.00			
		d) Formwork @ 3.75 per cent of a+b+c.				5328.36	
		e) Overhead charges @ 25% on (a+b+c+d)				36854.48	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				29483.59	
		cost of 15 cum = a+b+c+d+e+f				213756.00	
		Rate per cum (a+b+c+d+e+f)/15				14250.40	
					say	14250.00	
12.8 E	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Unit: cum					
		Taking Output = 120 cum					
		a) Material					
		Cement	tonne	48.38	7169.28	346849.77	M-081
		Coarse sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		b) Labour					
		Mate	day	0.84	582.53	489.32	L-12
		Mason	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	18.00	529.57	9532.26	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader 1 cum capacity 1 cum	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7059.00			
		d) Formwork @ 3.75 per cent on cost of concrete i.e. cost of material, labour and machinery				31761.78	
		e) Overhead charges @ 25% on (a+b+c+d)				219685.64	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				175748.51	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		cost of 120 cum = a+b+c+d+e+f				1274176.72	
		Rate per cum (a+b+c+d+e+f)/120				10618.14	
					say	<u>10618.00</u>	
12.8	F	PCC Grade M30					
	Case I	Using Concrete Mixer					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Cement	tonne	6.08	7169.28	43589.22	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		40 mm Aggregate	cum	5.40	1919.16	10363.47	M-055
		20 mm Aggregate	cum	5.40	2372.47	12811.35	M-053
		10 mm Aggregate	cum	2.70	2156.41	5822.30	M-051
		b) Labour					
		Mate	day	0.86	582.53	500.97	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9363.00			
		d) Formwork @ 3.50 per cent of cost of concrete i.e. cost of material, labour and machinery				4915.40	
		e) Overhead charges @ 25% on (a+b+c+d)				36338.89	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				29071.11	
		cost of 15 cum = a+b+c+d+e+f				210765.54	
		Rate per cum (a+b+c+d+e+f)/15				14051.04	
					say	<u>14051.00</u>	
12.8 F	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit : cum					
		Taking Output = 120 cum					
		a) Material					
		Cement	tonne	48.60	7169.28	348427.01	M-081
		Coarse sand	cum	54.00	1297.45	70062.10	M-004
		40 mm Aggregate	cum	43.20	2111.08	91198.54	M-055
		20 mm Aggregate	cum	43.20	2609.72	112739.92	M-053
		10 mm Aggregate	cum	21.60	2372.05	51236.27	M-051
		b) Labour					
		Mate	day	0.84	582.53	489.32	L-12
		Mason	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	18.00	529.57	9532.26	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		6935.00			
		d) Formwork @ 3.50 per cent of cost of concrete i.e. cost of material, labour and machinery				29125.26	
		e) Overhead charges @ 25% on (a+b+c+d)				215318.90	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				172255.12	
		cost of 120 cum = a+b+c+d+e+f				1248849.62	
		Rate per cum (a+b+c+d+e+f)/120				10407.08	
					say	<u>10407.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.8		G	RCC Grade M30					
		Case I	Using Concrete Mixer					
			Unit = cum					
			Taking output = 15 cum					
		a)	Material					
			Cement	tonne	6.10	7169.28	43732.61	M-081
			Coarse sand	cum	6.75	6977.61	47098.89	M-005
			20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
			10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
		b)	Labour					
			Mate	day	0.86	582.53	500.97	L-12
			Mason	day	1.50	635.48	953.23	L-11
			Mazdoor	day	20.00	529.57	10591.40	L-13
		c)	Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
			Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9497.00			
		d)	Formwork @ 3.5 per cent on cost of concrete i.e. cost of material, labour and machinery				4985.68	
		e)	Overhead charges @ 25% on (a+b+c+d)				36858.43	
		f)	Contractor's profit @ 16% on (a+b+c+d+e)				29486.74	
			cost of 15 cum = a+b+c+d+e+f				213778.89	
			Rate per cum = (a+b+c+d+e+f)/15				14251.93	
						say	14252.00	
12.8 G		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
		a)	Material					
			Cement	tonne	48.80	7169.28	349860.86	M-081
			Coarse sand	cum	54.00	1297.45	70062.10	M-004
			20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
			10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		b)	Labour					
			Mate	day	0.84	582.53	489.32	L-12
			Mason	day	3.00	635.48	1906.45	L-11
			Mazdoor	day	18.00	529.57	9532.26	L-13
		c)	Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
			Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
			Loader 1 cum capacity	hour	6.00	930.98	5585.90	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
			Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
			Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7084.00			
		d)	Formwork @ 3.5 per cent of cost of concrete i.e. cost of material, labour and machinery				29749.72	
		e)	Overhead charges @ 25% on (a+b+c+d)				219935.40	
		f)	Contractor's profit @ 16% on (a+b+c+d+e)				175948.32	
			cost of 120 cum = a+b+c+d+e+f				1275625.32	
			Rate per cum (a+b+c+d+e+f)/120				10630.21	
						say	10630.00	
12.8		H	RCC Grade M35					
		Case I	Using Concrete Mixer					
			Unit = cum					
			Taking output = 15 cum					
		a)	Material					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cement	tonne	6.33	7169.28	45381.54	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
		10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
		b) Labour					
		Mate	day	0.86	582.53	500.97	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9607.00			
		d) Formwork @ 3 per cent on a+b+c				4322.91	
		e) Overhead charges @ 25% on (a+b+c+d)				37104.97	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				29683.98	
		cost of 15 cum = a+b+c+d+e+f				215208.83	
		Rate per cum = (a+b+c+d+e+f)/15				14347.26	
					say	14347.00	
12.8 H	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit ; cum</i>					
		<i>Taking Output = 120 cum</i>					
		a) Material					
		Cement	tonne	50.64	7169.28	363052.34	M-081
		Coarse sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		b) Labour					
		Mate	day	0.84	582.53	489.32	L-12
		Mason	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	18.00	529.57	9532.26	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7194.00			
		d) Formwork @ 3 per cent on cost of concrete i.e. cost of material, labour and machinery				25895.50	
		e) Overhead charges @ 25% on (a+b+c+d)				222269.71	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				177815.77	
		cost of 120 cum = a+b+c+d+e+f				1289164.34	
		Rate per cum = (a+b+c+d+e+f)/120				10743.04	
					say	10743.00	
		Note: Where ever concrete is carried out using batching plant, transit mixer, concrete pump, Admixtures @ 0.4 per cent of weight of cement may be added for achieving desired slump of concrete.					
		WELL FOUNDATION					
12.9	1200	Providing and Constructing Temporary Island 16 m diameter for Construction of Well Foundation for 8m dia. Well.					
	A	Assuming depth of water 1.0 m and height of island to be 1.25 m.					
		<i>Unit = 1 No</i>					
		<i>Taking output = 1 No.</i>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Material					
		Earth (compacted)	cum	251.20	10.6	2660.56	M-092
		Sand bags	each	750.00	286.70	215026.77	M-159
		b) Labour					
		Mate	day	0.40	582.53	233.01	L-12
		Mazdoor for filling sand bags, stitching and placing	day	15.00	529.57	7943.55	L-13
		c) Machinery					
		Crane with grab 1 cum capacity	hour	20.00	1182.00	23640.00	P&M-012
		Consumables @ 2.5 per cent of (c) above				591.00	
		d) Overhead charges @ 25% on (a+b+c)				62523.72	
		e) Contractor's profit @ 16% on (a+b+c+d)				50018.98	
		Rate per No. (a+b+c+d+e)				362637.59	
					say	<u>362638.00</u>	
	Note	It is assumed that earth will be available within the working space of crane with grab bucket.					
12.9	B	Assuming depth of water 4.0 m and height of island 4.5 m.					
		Unit = 1 No					
		Taking output = 1 No					
		a) Material					
		Earth (compacted)	cum	904.32	10.59	9578.01	M-092
		Sand bags	each	6000.00	286.70	1720214.18	M-159
		Wooden ballies 8" Dia and 9 m long	each	95.00	174.76	16602.02	M-194
		Wooden ballies 2" Dia for bracing	metre	190.00	38.45	7304.89	M-193
		b) Labour					
		Mate	day	5.60	582.53	3262.15	L-12
		Mazdoor for piling 8" dia ballies for piling 8" dia ballies	day	18.00	529.57	9532.26	L-13
		Mazdoor for bracing with 2" dia ballies	day	12.00	529.57	6354.84	L-13
		Mazdoor for filling sand bags, stitching and placing	day	110.00	529.57	58252.69	L-13
		c) Machinery					
		Crane with grab 1 cum capacity	hour	50.00	1182.00	59100.00	P&M-012
		Consumables and other arrangements for piling ballies @ 2.5 per cent of (a+b+c).				47255.03	
		d) Overhead charges @ 25% on (a+b+c)				484364.01	
		e) Contractor's profit @ 16% on (a+b+c+d)				387491.21	
		Rate per No. (a+b+c+d+e)				2809311.28	
					say	<u>2809311.00</u>	
	Note	For other well diameters rate can be worked out on the basis of cross-sectional area of well. The diameter of the island shall be in the conformity with clause 1203.2 of MoRTH specifications.					
12.9	C	Providing and constructing one span service road to reach island location from one pier location to another pier location					
		Assuming span length 30 m, width of service road 10m and depth of water 1m					
		Unit = 1 meter					
		Taking output = 30 metre					
		a) Material					
		Earth	cum	450.00	10.59	4766.13	M-092
		Sand bags	each	300.00	286.70	86010.71	M-159
		b) Labour					
		Mate	day	0.24	582.53	139.81	L-12
		Mazdoor for filling sand bags, stitching and placing	day	6.00	529.57	3177.42	L-13
		c) Machinery					
		Front end Loader 1 cum capacity	hour	27.00	930.98	25136.56	P&M-017
		Tipper 5.5 cum capacity	hour	28.00	1006.18	28173.12	P&M-048
		d) Overhead charges @ 25% on (a+b+c)				36850.94	
		e) Contractor's profit @ 16% on (a+b+c+d)				29480.75	
		Cost for 30 m (a+b+c+d+e)				213735.43	
		Rate per m (a+b+c+d+e)/30				7124.51	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
					say	<u>7125.00</u>	
12.10	1200 & 1900	Providing and Laying Cutting Edge of Mild Steel weighing 40 kg per metre for Well Foundation complete as per Drawing and Technical Specification.					
		Unit = 1 MT					
		Taking output = 1 MT					
		a) Material					
		Structural steel in plates, angles, etc including 5 per cent wastage	tonne	1.05	60667.13	63700.49	M-179
		Nuts & bolts	Kg	20.00	99.87	1997.48	M-130
		b) Labour					
		(for cutting, bending, making holes, joining, welding and erecting in position)					
		Mate	day	1.32	582.53	768.94	L-12
		Fitter	day	5.50	635.48	3495.16	L-08
		Blacksmith	day	5.50	635.48	3495.16	L-02
		Welder	day	5.50	635.48	3495.16	L-02
		Mazdoor	day	16.50	529.57	8737.90	L-13
		Electrodes, cutting gas and other consumables @ 10 per cent of cost of (a) above				6569.80	
		c) Overhead charges @ 25% on (a+b)				23065.02	
		d) Contractor's profit @ 16% on (a+b+c)				18452.02	
		Rate per MT (a+b+c+d)				133777.13	
					say	<u>133777.00</u>	
12.11	1200, 1500 & 1700	Plain/Reinforced Cement Concrete, in Well Foundation complete as per Drawing and Technical Specification.					
		Unit = 1 cum					
		Taking output = 1 cum					
	A	Well curb					
	(i)	RCC M20 Grade					
		Same as for 12.8 (C) except for formwork which shall be @ 20 per cent of the cost of concrete instead of 4 per cent.					
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				8923.00	
		d) formwork @ 20 per cent of the cost of concrete				1784.60	
		e) Overhead charges @ 25% on (a+b+c+d)				2676.90	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				2141.52	
		Rate perm (a+b+c+d+e+f)				15526.02	
					say	<u>15526.00</u>	
12.11 A (i)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				6657.00	
		d) formwork @ 20 per cent of the cost of concrete				1331.40	
		e) Overhead charges @ 25% on (a+b+c+d)				1997.10	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1597.68	
		Rate perm (a+b+c+d+e+f)				11583.18	
					say	<u>11583.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.11 A		(ii)	RCC M25 Grade					
			Same as for 12.8 (E) except for formwork which shall be @ 20 per cent of the cost of concrete instead of 3.75 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				9473.00	
			d) formwork @ 20 per cent of the cost of concrete				1894.60	
			e) Overhead charges @ 25% on (a+b+c+d)				2841.90	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				2273.52	
			Rate perm (a+b+c+d+e+f)				16483.02	
						say	16483.00	
12.11 A (ii)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				7666.00	
			d) formwork @ 20 per cent of the cost of concrete				1533.20	
			e) Overhead charges @ 25% on (a+b+c+d)				2299.80	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1839.84	
			Rate perm (a+b+c+d+e+f)				13338.84	
						say	13339.00	
12.11 A		(iii)	RCC M35 Grade					
			Same as for 12.8 (H) except for formwork which shall be @ 20 per cent of the cost of concrete instead of 3.0 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				9607.00	
			d) formwork @ 20 per cent of the cost of concrete				1921.40	
			e) Overhead charges @ 25% on (a+b+c+d)				2882.10	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				2305.68	
			Rate perm (a+b+c+d+e+f)				16716.18	
						say	16716.00	
12.11 A (iii)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				7829.00	
			d) formwork @ 20 per cent of the cost of concrete				1565.80	
			e) Overhead charges @ 25% on (a+b+c+d)				2348.70	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1878.96	
			Rate perm (a+b+c+d+e+f)				13622.46	
						say	13622.00	
		Note.	If curb concrete is carried out within steel liner, cost of formwork shall be excluded.					
12.11		B	Well steining					
		(I)	PCC M15 Grade					
			Same as for 12.8 (A) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 4 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				8090.00	
			d) formwork @ 10 per cent of the cost of concrete				809.00	
			e) Overhead charges @ 25% on (a+b+c+d)				2224.75	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1779.80	
			Rate perm (a+b+c+d+e+f)				12903.55	
						say	12904.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.11 B		(ii)	PCC M20 Grade					
			Same as for 12.8 (B) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 4 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				8923.00	
			d) formwork @ 10 per cent of the cost of concrete				892.30	
			e) Overhead charges @ 25% on (a+b+c+d)				2453.83	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1963.06	
			Rate perm (a+b+c+d+e+f)				14232.19	
						say	14232.00	
12.11 B		(iii)	RCC M20 Grade					
			Same as for 12.8 (C) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 4 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				9072.00	
			d) formwork @ 10 per cent of the cost of concrete				907.20	
			e) Overhead charges @ 25% on (a+b+c+d)				2494.80	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1995.84	
			Rate perm (a+b+c+d+e+f)				14469.84	
						say	14470.00	
12.11 B (iii)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				6657.00	
			d) formwork @ 10 per cent of the cost of concrete				665.70	
			e) Overhead charges @ 25% on (a+b+c+d)				1830.68	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1464.54	
			Rate perm (a+b+c+d+e+f)				10617.92	
						say	10618.00	
12.11 B		(iv)	PCC M25 Grade					
			Same as for 12.8 (D) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 4 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				9320.00	
			d) formwork @ 10 per cent of the cost of concrete				932.00	
			e) Overhead charges @ 25% on (a+b+c+d)				2563.00	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				2050.40	
			Rate perm (a+b+c+d+e+f)				14865.40	
						say	14865.00	
12.11 B (iv)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				6896.00	
			d) formwork @ 10 per cent of the cost of concrete				689.60	
			e) Overhead charges @ 25% on (a+b+c+d)				1896.40	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1517.12	
			Rate perm (a+b+c+d+e+f)				10999.12	
						say	10999.00	
12.11 B		(v)	RCC M25 Grade					
			Same as for 12.8 (E) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 3.5 per cent.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				9473.00	
		d) formwork @ 10 per cent of the cost of concrete				947.30	
		e) Overhead charges @ 25% on (a+b+c+d)				2605.08	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				2084.06	
		Rate perm (a+b+c+d+e+f)				15109.44	
					say	<u>15109.00</u>	
12.11 B (v)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				7666.00	
		d) formwork @ 10 per cent of the cost of concrete				766.60	
		e) Overhead charges @ 25% on (a+b+c+d)				2108.15	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1686.52	
		Rate perm (a+b+c+d+e+f)				12227.27	
					say	<u>12227.00</u>	
12.11 B	(vi)	PCC M30 Grade					
		Same as for 12.8 (F) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 3.5 per cent.					
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				9363.00	
		d) formwork @ 10 per cent of the cost of concrete				936.30	
		e) Overhead charges @ 25% on (a+b+c+d)				2574.83	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				2059.86	
		Rate perm (a+b+c+d+e+f)				14933.99	
					say	<u>14934.00</u>	
12.11 B (vi)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				6935.00	
		d) formwork @ 10 per cent of the cost of concrete				693.50	
		e) Overhead charges @ 25% on (a+b+c+d)				1907.13	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1525.70	
		Rate perm (a+b+c+d+e+f)				11061.33	
					say	<u>11061.00</u>	
12.11 B	(vii)	RCC M30 Grade					
		Same as for 12.8 (G) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 3.5 per cent.					
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				9497.00	
		d) formwork @ 10 per cent of the cost of concrete				949.70	
		e) Overhead charges @ 25% on (a+b+c+d)				2611.68	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				2089.34	
		Rate perm (a+b+c+d+e+f)				15147.72	
					say	<u>15148.00</u>	
12.11 B (vii)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				7084.00	
		d) formwork @ 10 per cent of the cost of concrete				708.40	
		e) Overhead charges @ 25% on (a+b+c+d)				1948.10	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1558.48	
		Rate perm (a+b+c+d+e+f)				11298.98	
					say	<u>11299.00</u>	
12.11 B	(viii)	RCC M35 Grade					
		Same as for 12.8 (H) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 3 per cent.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				9607.00	
		d) formwork @ 10 per cent of the cost of concrete				960.70	
		e) Overhead charges @ 25% on (a+b+c+d)				2641.93	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				2113.54	
		Rate perm (a+b+c+d+e+f)				15323.17	
					say	15323.00	
12.11 B (viii)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				7829.00	
		d) formwork @ 10 per cent of the cost of concrete				782.90	
		e) Overhead charges @ 25% on (a+b+c+d)				2152.98	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1722.38	
		Rate perm (a+b+c+d+e+f)				12487.26	
					say	12487.00	
12.11 B	(ix)	RCC M40 Grade					
		Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	51.60	7169.28	369934.85	M-081
		Coarse Sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		Admixture	kg	206.00	376.63	77585.80	M-180
		b) Labour					
		Mate	day	0.84	582.53	489.32	L-12
		Meson	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	18.00	529.57	9532.26	L-13
		c) Machinery					
		Batching Plant	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
		Transit Mixer 4 cum capacity for lead beyond 1 km.	tonne.km	300xL	38.45	115340.32	Lead= 10 . P&M-050
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		63177.00			
		d) Formwork @ 10 per cent on cost of concrete i.e. cost of material, labour and machinery				94765.17	
		e) Overhead charges @ 25% on (a+b+c+d)				260604.21	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				208483.37	
		cost of 120 cum = a+b+c+d+e+f				1511504.41	
		Rate per cum = (a+b+c+d+e+f)/120				12595.87	
					say	12596.00	
12.11 C	C	Bottom Plug					
		Concrete to be placed using tremie pipe					
		Note: 10% extra cement to be added where under water concreting is involved					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	(i)	PCC Grade M20					
	Case I	Using Concrete Mixer					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Cement	tonne	5.55	7169.28	39789.50	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		40 mm Aggregate	cum	5.40	1919.16	10363.47	M-055
		20 mm Aggregate	cum	5.40	2372.47	12811.35	M-053
		10 mm Aggregate	cum	2.70	2156.41	5822.30	M-051
		Admixture	Kg	18.60	376.63	7005.32	M-180
		b) Labour					
		Mate	day	0.90	582.53	524.27	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
		Light Crane 3 tonnes capacity for handling tremie pipe	hour	6.00	788.00	4728.00	P&M-013
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		9894.00			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				6747.99	
		d) Overhead charges @ 25% on (a+b+c)				38786.26	
		e) Contractor's profit @ 16% on (a+b+c+d)				31029.01	
		cost of 15 cum = a+b+c+d+e				224960.30	
		Rate per cum = (a+b+c+d+e)/15				14997.35	
					say	14997.00	
12.11 C (i)	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Unit ; cum					
		Taking Output = 120 cum					
		a) Material					
		Cement	tonne	44.40	7169.28	318316.03	M-081
		Coarse sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		Admixture	Kg	148.80	376.63	56042.56	M-180
		b) Labour					
		Mate	day	0.88	582.53	512.62	L-12
		Mason	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	18.00	529.57	9532.26	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7288.00			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				36397.72	
		d) Overhead charges @ 25% on (a+b+c)				227727.66	
		e) Contractor's profit @ 16% on (a+b+c+d)				182182.13	
		cost of 120 cum = a+b+c+d+e				1320820.42	
		Rate per cum = (a+b+c+d+e)/120				11006.84	
					say	11007.00	
12.11 C	(ii)	PCC Grade M25					
	Case I	Using Concrete Mixer					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Cement	tonne	5.99	7169.28	42943.99	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		40 mm Aggregate	cum	5.40	1919.16	10363.47	M-055
		20 mm Aggregate	cum	5.40	2372.47	12811.35	M-053
		10 mm Aggregate	cum	2.70	2156.41	5822.30	M-051
		Admixture	Kg	21.60	376.63	8135.21	M-180
		b) Labour					
		Mate	day	0.90	582.53	524.27	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	788.00	4728.00	P&M-013
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		10179.00			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				6962.21	
		d) Overhead charges @ 25% on (a+b+c)				39910.91	
		e) Contractor's profit @ 16% on (a+b+c+d)				31928.72	
		cost of 15 cum = a+b+c+d+e				231483.25	
		Rate per cum = (a+b+c+d+e)/15				15432.22	
					say	15432.00	
12.11 C (ii)	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	tonne	47.88	7169.28	343265.13	M-081
		Coarse sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		Admixture	Kg	172.80	376.63	65081.68	M-180
		b) Labour					
		Mate	day	0.88	582.53	512.62	L-12
		Mason	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	18.00	529.57	9532.26	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7571.00			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				38097.13	
		d) Overhead charges @ 25% on (a+b+c)				236649.57	
		e) Contractor's profit @ 16% on (a+b+c+d)				189319.65	
		cost of 120 cum = a+b+c+d+e				1372567.48	
		Rate per cum = (a+b+c+d+e)/120				11438.06	
					say	<u>11438.00</u>	
12.11 C	(iii)	PCC Grade M30					
	Case I	Using Concrete Mixer					
		Unit = 1 cum					
		Taking output = 15 cum					
		a) Material					
		Cement	tonne	6.08	7169.28	43589.22	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		40 mm Aggregate	cum	5.40	1919.16	10363.47	M-055
		20 mm Aggregate	cum	5.40	2372.47	12811.35	M-053
		10 mm Aggregate	cum	2.70	2156.41	5822.30	M-051
		Admixture	Kg	21.60	376.63	8135.21	M-180
		b) Labour					
		Mate	day	0.90	582.53	524.27	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	788.00	4728.00	P&M-013
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		10222.00			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				6994.47	
		d) Overhead charges @ 25% on (a+b+c)				40080.28	
		e) Contractor's profit @ 16% on (a+b+c+d)				32064.22	
		cost of 15 cum = a+b+c+d+e				232465.62	
		Rate per cum = (a+b+c+d+e)/15				15497.71	
					say	<u>15498.00</u>	
12.11 C (iii)	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	tonne	48.64	7169.28	348713.78	M-081
		Coarse sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		Admixture	Kg	172.80	376.63	65081.68	M-180
		b) Labour					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mate	day	0.88	582.53	512.62	L-12
		Mason	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	18.00	529.57	9532.26	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7617.00			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				38369.57	
		d) Overhead charges @ 25% on (a+b+c)				238079.84	
		e) Contractor's profit @ 16% on (a+b+c+d)				190463.87	
		cost of 120 cum = a+b+c+d+e				1380863.05	
		Rate per cum = (a+b+c+d+e)/120				11507.19	
					say	11507.00	
12.11 C	(iv)	PCC Grade M35					
	Case I	Using Concrete Mixer					
		Unit = 1 cum					
		Taking output = 15 cum					
		a) Material					
		Cement	tonne	6.29	7169.28	45094.77	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		40 mm Aggregate	cum	5.40	1919.16	10363.47	M-055
		20 mm Aggregate	cum	5.40	2372.47	12811.35	M-053
		10 mm Aggregate	cum	2.70	2156.41	5822.30	M-051
		Admixture	Kg	21.60	376.63	8135.21	M-180
		b) Labour					
		Mate	day	0.90	582.53	524.27	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	788.00	4728.00	P&M-013
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		10323.00			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				7069.74	
		d) Overhead charges @ 25% on (a+b+c)				40475.49	
		e) Contractor's profit @ 16% on (a+b+c+d)				32380.39	
		cost of 15 cum = a+b+c+d+e				234757.82	
		Rate per cum = (a+b+c+d+e)/15				15650.52	
					say	15651.00	
12.11 C (iv)	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	tonne	50.28	7169.28	360471.40	M-081
		Coarse sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Admixture	Kg	172.80	376.63	65081.68	M-180
		b) Labour					
		Mate	day	0.88	582.53	512.62	L-12
		Mason	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	18.00	529.57	9532.26	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		7715.00			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				38957.45	
		d) Overhead charges @ 25% on (a+b+c)				241166.21	
		e) Contractor's profit @ 16% on (a+b+c+d)				192932.97	
		cost of 120 cum = a+b+c+d+e				1398764.03	
		Rate per cum = (a+b+c+d+e)/120				11656.37	
					say	11656.00	
12.11	D	Intermediate plug					
	(i)	Grade M20 PCC					
		Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				9894.00	
		d) Overhead charges @ 25% on (a+b+c)				2473.50	
		e) Contractor's profit @ 16% on (a+b+c+d)				1978.80	
		Rate per cum = (a+b+c+d+e)				14346.30	
					say	14346.00	
12.11 D (i)	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				7288.00	
		d) Overhead charges @ 25% on (a+b+c)				1822.00	
		e) Contractor's profit @ 16% on (a+b+c+d)				1457.60	
		Rate per cum = (a+b+c+d+e)				10567.60	
					say	10568.00	
12.11 D	(ii)	Grade M25 PCC					
		Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				10179.00	
		d) Overhead charges @ 25% on (a+b+c)				2544.75	
		e) Contractor's profit @ 16% on (a+b+c+d)				2035.80	
		Rate per cum = (a+b+c+d+e)				14759.55	
					say	14760.00	
12.11 D (ii)	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				7571.00	
		d) Overhead charges @ 25% on (a+b+c)				1892.75	
		e) Contractor's profit @ 16% on (a+b+c+d)				1514.20	
		Rate per cum = (a+b+c+d+e)				10977.95	
					say	10978.00	
12.11 D	(iii)	Grade M30 PCC					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				10222.00	
		d) Overhead charges @ 25% on (a+b+c)				2555.50	
		e) Contractor's profit @ 16% on (a+b+c+d)				2044.40	
		Rate per cum = (a+b+c+d+e)				14821.90	
					say	<u>14822.00</u>	
12.11 D (iii)	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				7617.00	
		d) Overhead charges @ 25% on (a+b+c)				1904.25	
		e) Contractor's profit @ 16% on (a+b+c+d)				1523.40	
		Rate per cum = (a+b+c+d+e)				11044.65	
					say	<u>11045.00</u>	
12.11	E	Top plug					
	(i)	Grade M15 PCC					
		Same as Item 12.8(a) excluding formwork					
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				8090.00	
		d) Overhead charges @ 25% on (a+b+c)				2022.50	
		e) Contractor's profit @ 16% on (a+b+c+d)				1618.00	
		Rate per cum = (a+b+c+d+e)				11730.50	
					say	<u>11731.00</u>	
12.11 E	(ii)	Grade M20 PCC					
		Same as Item 12.8(b) excluding formwork					
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				8923.00	
		d) Overhead charges @ 25% on (a+b+c)				2230.75	
		e) Contractor's profit @ 16% on (a+b+c+d)				1784.60	
		Rate per cum = (a+b+c+d+e)				12938.35	
					say	<u>12938.00</u>	
12.11 E	(iii)	Grade M25 PCC					
		Same as Item 12.8 (d) excluding formwork					
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				9320.00	
		d) Overhead charges @ 25% on (a+b+c)				2330.00	
		e) Contractor's profit @ 16% on (a+b+c+d)				1864.00	
		Rate per cum = (a+b+c+d+e)				13514.00	
					say	<u>13514.00</u>	
12.11 E (iii)	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				6896.00	
		d) Overhead charges @ 25% on (a+b+c)				1724.00	
		e) Contractor's profit @ 16% on (a+b+c+d)				1379.20	
		Rate per cum = (a+b+c+d+e)				9999.20	
					say	<u>9999.00</u>	
12.11 E	(iv)	Grade M30 PCC					
		Same as Item 12.8(f) excluding formwork					
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				9363.00	
		d) Overhead charges @ 25% on (a+b+c)				2340.75	
		e) Contractor's profit @ 16% on (a+b+c+d)				1872.60	
		Rate per cum = (a+b+c+d+e)				13576.35	
					say	<u>13576.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.11 E (iv)		Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				6935.00	
			d) Overhead charges @ 25% on (a+b+c)				1733.75	
			e) Contractor's profit @ 16% on (a+b+c+d)				1387.00	
			Rate per cum = (a+b+c+d+e)				10055.75	
						say	<u>10056.00</u>	
12.11		F	Well cap					
		(i)	RCC Grade M20					
		Case I	Using Concrete Mixer					
			Unit = cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	5.12	7169.28	36706.71	M-081
			Coarse sand	cum	6.75	6977.61	47098.89	M-005
			20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
			10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
			b) Labour					
			Mate	day	0.86	582.53	500.97	L-12
			Mason	day	1.50	635.48	953.23	L-11
			Mazdoor	day	20.00	529.57	10591.40	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
			Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
			Form Work @ 4 per cent of a+b+c				5416.89	
			d) Overhead charges @ 25% on (a+b+c)				35209.76	
			e) Contractor's profit @ 16% on (a+b+c+d)				28167.81	
			cost of 15 cum = a+b+c+d+e				204216.59	
			Rate per cum = (a+b+c+d+e)/15				13614.44	
						say	<u>13614.00</u>	
12.11 F (i)		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
			a) Material					
			Cement	tonne	40.92	7169.28	293366.94	M-081
			Coarse sand	cum	54.00	1297.45	70062.10	M-004
			20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
			10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
			b) Labour					
			Mate	day	0.84	582.53	489.32	L-12
			Mason	day	3.00	635.48	1906.45	L-11
			Mazdoor	day	18.00	529.57	9532.26	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
			Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
			Loader (capacity 1 cum)	hour	6.00	930.98	5585.90	P&M-017
			Transit Mixer (capacity 4.0 cu.m)					
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
			Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
			Formwork @ 4 per cent of (a+b+c)				31739.92	
			d) Overhead charges @ 25% on (a+b+c)				206309.47	
			e) Contractor's profit @ 16% on (a+b+c+d)				165047.57	
			cost of 120 cum = a+b+c+d+e				1196594.92	
			Rate per cum = (a+b+c+d+e)/120				9971.62	
						say	<u>9972.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.11 F		(ii)	RCC Grade M25					
		Case I	Using Concrete Mixer					
			Unit = cum					
			Taking output = 15 cum					
		a)	Material					
			Cement	tonne	6.05	7169.28	43374.14	M-081
			Coarse sand	cum	6.75	6977.61	47098.89	M-005
			20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
			10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
		b)	Labour					
			Mate	day	0.86	582.53	500.97	L-12
			Mason	day	1.50	635.48	953.23	L-11
			Mazdoor	day	20.00	529.57	10591.40	L-13
		c)	Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
			Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
			Form Work @ 3.75 per cent of a+b+c				5328.36	
		d)	Overhead charges @ 25% on (a+b+c)				36854.48	
		e)	Contractor's profit @ 16% on (a+b+c+d)				29483.59	
			cost of 15 cum = a+b+c+d+e				213756.00	
			Rate per cum = (a+b+c+d+e)/15				14250.40	
						say	<u>14250.00</u>	
12.11 F (ii)		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
		a)	Material					
			Cement	tonne	48.40	7169.28	346993.15	M-081
			Coarse sand	cum	54.00	1297.45	70062.10	M-004
			20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
			10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		b)	Labour					
			Mate	day	0.84	582.53	489.32	L-12
			Mason	day	3.00	635.48	1906.45	L-11
			Mazdoor	day	18.00	529.57	9532.26	L-13
		c)	Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
			Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
			Loader (capacity 1 cum)	hour	6.00	930.98	5585.90	P&M-017
			Transit Mixer (capacity 4.0 cu.m)					
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
			Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
			Formwork @ 3.75 per cent of (a+b+c)				31767.16	
		d)	Overhead charges @ 25% on (a+b+c)				219722.83	
		e)	Contractor's profit @ 16% on (a+b+c+d)				175778.27	
			cost of 120 cum = a+b+c+d+e				1274392.42	
			Rate per cum = (a+b+c+d+e)/120				10619.94	
						say	<u>10620.00</u>	
12.11 F		(iii)	RCC Grade M30					
		Case I	Using Concrete Mixer					
			Unit = cum					
			Taking output = 15 cum					
		a)	Material					
			Cement	tonne	6.10	7169.28	43732.61	M-081
			Coarse sand	cum	6.75	6977.61	47098.89	M-005
			20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
		b) Labour					
		Mate	day	0.86	582.53	500.97	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
		Formwork @ 3.5 per cent of (a+b+c)				4985.68	
		d) Overhead charges @ 25% on (a+b+c)				36858.43	
		e) Contractor's profit @ 16% on (a+b+c+d)				29486.74	
		cost of 15 cum = a+b+c+d+e				213778.89	
		Rate per cum = (a+b+c+d+e)/15				14251.93	
					say	14252.00	
12.11 F (iii)	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	48.79	7169.28	349789.17	M-081
		Coarse sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		b) Labour					
		Mate	day	0.84	582.53	489.32	L-12
		Mason	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	18.00	529.57	9532.26	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader (capacity 1 cum)	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer (capacity 4.0 cu.m)					
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
		Formwork @ 3.5 per cent of (a+b+c)				29747.21	
		d) Overhead charges @ 25% on (a+b+c)				219916.85	
		e) Contractor's profit @ 16% on (a+b+c+d)				175933.48	
		cost of 120 cum = a+b+c+d+e				1275517.72	
		Rate per cum = (a+b+c+d+e)/120				10629.31	
					say	10629.00	
12.11 F	(iv)	RCC Grade M35					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	6.33	7169.28	45381.54	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
		10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
		b) Labour					
		Mate	day	0.86	582.53	500.97	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Formwork @ 3 per cent of (a+b+c)				4322.91	
		d) Overhead charges @ 25% on (a+b+c)				37104.97	
		e) Contractor's profit @ 16% on (a+b+c+d)				29683.98	
		cost of 15 cum = a+b+c+d+e				215208.83	
		Rate per cum = (a+b+c+d+e)/15				14347.26	
					say	<u>14347.00</u>	
12.11 F (iv)	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	tonne	50.64	7169.28	363052.34	M-081
		Coarse sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		b) Labour					
		Mate	day	0.84	582.53	489.32	L-12
		Mason	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	18.00	529.57	9532.26	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader (capacity 1 cum)	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer (capacity 4.0 cu.m)					
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	P&M-050 Lead= 10 km
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
		Formwork @ 3 per cent of (a+b+c)				25895.50	
		d) Overhead charges @ 25% on (a+b+c)				222269.71	
		e) Contractor's profit @ 16% on (a+b+c+d)				177815.77	
		cost of 120 cum = a+b+c+d+e				1289164.34	
		Rate per cum = (a+b+c+d+e)/120				10743.04	
					say	<u>10743.00</u>	
	Note	Where ever concrete is carried out using batching plant, transit mixer, concrete pump, Admixtures @ 0.4 per cent of weight of cement may be added for achieving desired slump of concrete.					
12.11 F	(v)	RCC M40 Grade					
		Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	tonne	52.20	7169.28	374236.42	M-081
		Coarse Sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		Admixture	kg	206.00	376.63	77585.80	M-180
		b) Labour					
		Mate	day	0.84	582.53	489.32	L-12
		Mason	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	18.00	529.57	9532.26	L-13
		c) Machinery					
		Batching Plant	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader 1 cum capacity	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	165.23	2478.39	P&M-049

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Transit Mixer 4 cum capacity for lead beyond 1 km.	tonne.km	300.L	38.45	115340.32	P&M-050 Lead= 10 km
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
		Formwork @ 3 per cent on cost of concrete i.e. cost of material, labour and machinery				28558.60	
		d) Overhead charges @ 25% on (a+b+c)				245127.96	
		e) Contractor's profit @ 16% on (a+b+c+d)				196102.37	
		cost of 120 cum = a+b+c+d+e				1421742.16	
		Rate per cum = (a+b+c+d+e)/120				11847.85	
					say	<u>11848.00</u>	
12.12	Section 1200	Sinking of 6 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
		<i>Unit = Running Meter.</i>					
		<i>Taking output = 1 m</i>					
		<i>Diameter of well - 6 m.</i>					
	A	Sandy Soil					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking = 0.50 m per hour.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.12	582.53	69.90	L-12
		Sinker (skilled)	day	1.00	688.44	688.44	L-15
		Sinking helper (semi-skilled)	day	2.00	582.53	1165.05	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	2.00	627.54	1255.08	P&M-075
		Consumables in sinking @10 per cent of (b)				125.51	
		c) Overhead charges @ 25% on (a+b)				826.00	
		d) Contractor's profit @ 16% on (a+b+c)				660.80	
		Rate per metre = (a+b+c+d)				4790.78	
					say	4791.00	
12.12 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking = 0.33 m per hour.					
		a) Labour					
		Mate	day	0.15	582.53	87.38	L-12
		Sinker	day	1.25	688.44	860.55	L-15
		Sinking helper (semi-skilled)	day	2.50	582.53	1456.32	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories	hour	3.00	627.54	1882.62	P&M-075
		Consumables in sinking @10 per cent of (b)				188.26	
		c) Overhead charges @ 25% on (a+b)				1118.78	
		d) Contractor's profit @ 16% on (a+b+c)				895.03	
		Rate per metre = (a+b+c+d)				6488.94	
					say	6489.00	
12.12 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		11th m	5%	6813.00			
		12th m	5%	7154.00			
		13th m	5%	7512.00			
		14th m	5%	7888.00			
		15th m	5%	8282.00			
		16th m	5%	8696.00			
		17th m	5%	9131.00			
		18th m	5%	9588.00			
		19th m	5%	10067.00			
		20th m	5%	10570.00			
		Total Cost from 10m upto 20m		85701.00			
		Avg Rate per metre		8570.00			
12.12 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.				Including 20% for Kentledge	
		21st m	7.5%	11363.00	13636.00		
		22nd m	7.5%	12215.00	14658.00		
		23rd m	7.5%	13131.00	15757.00		
		24th m	7.5%	14116.00	16939.00		
		25th m	7.5%	15175.00	18210.00		
		26th m	7.5%	16313.00	19576.00		
		27th m	7.5%	17536.00	21043.00		
		28th m	7.5%	18851.00	22621.00		
		29th m	7.5%	20265.00	24318.00		
		30th m	7.5%	21785.00	26142.00		
		Total Cost from 20m upto 30m		160750.00	192900.00		
		Avg Rate per metre		16075.00	19290.00		
12.12 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.			Including 20% for Kentledge		
		31st m	10%	23964.00	28757.00		
		32nd	10%	26360.00	31632.00		
		33rd m	10%	28996.00	34795.00		
		34th m	10%	31896.00	38275.00		
		35th m	10%	35086.00	42103.00		
		36th m	10%	38595.00	46314.00		
		37th m	10%	42455.00	50946.00		
		38th m	10%	46701.00	56041.00		
		39th m	10%	51371.00	61645.00		
		40th m	10%	56508.00	67810.00		
		Total Cost from 30m upto 40m		381932.00	458318.00		
		Avg Rate per metre		38193.00	45832.00		
12.12	B	Clayey Soil (6m dia. Well)					
		Unit = Running Meter.					
		Taking output = 1 meter					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking = 0.33 m per hour.					
		a) Labour					
		Mate	day	0.15	582.53	87.38	L-12
		Sinker (skilled)	day	1.50	688.44	1032.66	L-15
		Sinking helper (semi-skilled)	day	2.25	582.53	1310.69	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories	hour	3.00	627.54	1882.62	P&M-075
		Consumables in sinking @ 10 per cent of (b)				188.26	
		c) Overhead charges @ 25% on (a+b)				1125.40	
		d) Contractor's profit @ 16% on (a+b+c)				900.32	
		Rate per metre = (a+b+c+d)				6527.33	
					say	6527.00	
12.12 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking = 0.17 m per hour.					
		a) Labour					
		Mate	day	0.30	582.53	174.76	L-12
		Sinker	day	3.00	688.44	2065.32	L-15
		Sinking helper (semi-skilled)	day	4.50	582.53	2621.37	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	627.54	3765.24	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	2.00	288.03	576.07	P&M-063
		Consumables in sinking @ 10 per cent of (b)				434.13	
		c) Overhead charges @ 25% on (a+b)				2409.22	
		d) Contractor's profit @ 16% on (a+b+c)				1927.38	
		Rate per metre = (a+b+c+d)				13973.49	
					say	13973.00	
12.12 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 per cent of cost, if required.			Including for dewatering @ 5% of cost, if required		
		11th m	5%	14672.00	15406.00		
		12th m	5%	15406.00	16176.00		
		13th m	5%	16176.00	16985.00		
		14th m	5%	16985.00	17834.00		
		15th m	5%	17834.00	18726.00		
		16th m	5%	18726.00	19662.00		
		17th m	5%	19662.00	20645.00		

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		18th m	5%	20645.00	21677.00		
		19th m	5%	21677.00	22761.00		
		20th m	5%	22761.00	23899.00		
		Total Cost from 10m upto 20m		184544.00	193771.00		
		Avg Rate per metre		<u>18454.00</u>	<u>19377.00</u>		
12.12 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 per cent of cost for dewatering of the cost, if required					
	c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 25% for Kentledge	Including 5% for dewatering, if required	
		21st m	7.5%	24468.00	30585.00	32114.00	
		22nd m	7.5%	26303.00	32879.00	34523.00	
		23rd m	7.5%	28276.00	35345.00	37112.00	
		24th m	7.5%	30397.00	37996.00	39896.00	
		25th m	7.5%	32677.00	40846.00	42888.00	
		26th m	7.5%	35128.00	43910.00	46106.00	
		27th m	7.5%	37763.00	47204.00	49564.00	
		28th m	7.5%	40595.00	50744.00	53281.00	
		29th m	7.5%	43640.00	54550.00	57278.00	
		30th m	7.5%	46913.00	58641.00	61573.00	
		Total Cost from 20m upto 30m		346160.00	432700.00	454335.00	
		Avg Rate per metre		<u>34616.00</u>	<u>43270.00</u>	<u>45434.00</u>	
12.12 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 per cent of cost for dewatering, if required					
	c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
		31st m	10%	51604.00	61925.00	65021.00	
		32nd	10%	56764.00	68117.00	71523.00	
		33rd m	10%	62440.00	74928.00	78674.00	
		34th m	10%	68684.00	82421.00	86542.00	
		35th m	10%	75552.00	90662.00	95195.00	
		36th m	10%	83107.00	99728.00	104714.00	
		37th m	10%	91418.00	109702.00	115187.00	
		38th m	10%	100560.00	120672.00	126706.00	
		39th m	10%	110616.00	132739.00	139376.00	
		40th m	10%	121678.00	146014.00	153315.00	
		Total Cost from 30m upto 40m		822423.00	986908.00	1036253.00	
		Avg Rate per metre		<u>82242.00</u>	<u>98691.00</u>	<u>103625.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.12		C	Soft Rock (6m dia well)					
			Unit = Running Meter.					
			Taking output = 1 m					
			Depth in Soft rock strata up to 3m					
			Rate of sinking = 0.25 m per hour.					
			a) Labour					
			Mate	day	0.92	582.53	535.92	L-12
			Sinker (skilled)	day	3.00	688.44	2065.32	L-15
			Sinking helper (semi-skilled)	day	20.00	582.53	11650.54	L-14
			Diver	day	0.50	794.35	397.18	L-07
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	627.54	2510.16	P&M-075
			Air compressor with pneumatic breakers	hour	3.50	288.03	1008.12	P&M-063
			Consumables in sinking @ 10 per cent of (b)				351.83	
			Add for dewatering @ of 5 per cent of (a+b), if required				925.95	
			c) Overhead charges @ 25% on (a+b)				4861.26	
			d) Contractor's profit @ 16% on (a+b+c)				3889.00	
			Rate per metre = (a+b+c+d)				28195.28	
						say	<u>28195.00</u>	
12.12		D	Hard Rock (6m dia well)					
			Unit = Running Meter					
			Taking output = 1 m					
			Depth in hard rock strata upto 3 m					
			Rate of sinking = 0.17 m per hour.					
			a) Material					
			Gelatine 80 per cent	Kg	4.00	406.76	1627.04	M-104
			Electric Detonators	each	18.00	2.69	48.42	M-094/100
			b) Labour					
			Mate	day	1.56	582.53	908.74	L-12
			Driller	day	2.00	635.48	1270.97	L-06
			Blaster	day	0.25	635.48	158.87	L-03
			Mazdoor	day	12.00	529.57	6354.84	L-13
			Mazdoor (Skilled)	day	4.00	688.44	2753.76	L-15
			c) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	627.54	3765.24	P&M-075
			Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.00	288.03	576.07	P&M-063
			Dewatering @ 5 per cent of cost of (b+c), if required.				789.42	
			Consumables in sinking @ 10 per cent of cost of (b).				434.13	
			d) Overhead charges @ 25% on (a+b+c)				4671.88	
			e) Contractor's profit @ 16% on (a+b+c+d)				3737.50	
			Rate per metre = (a+b+c+d+e)				27096.89	
						say	<u>27097.00</u>	
12.13	Section 1200		Sinking of 7 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
			Unit = Running Meter.					
			Taking output = 1 m					
			Diameter of well - 7 m.					
		A	Sandy Soil					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking = 0.30 m per hour.					
		a) Labour					
		Mate	day	0.15	582.53	87.38	L-12
		Sinker (skilled)	day	1.25	688.44	860.55	L-15
		Sinking helper (semi-skilled)	day	2.50	582.53	1456.32	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	3.25	627.54	2039.51	P&M-075
		Consumables in sinking @10 per cent of (b)				203.95	
		c) Overhead charges @ 25% on (a+b)				1161.93	
		d) Contractor's profit @ 16% on (a+b+c)				743.63	
		Rate per metre = (a+b+c+d)				6553.26	
12.13 A	(ii)	Beyond 3m upto 10m depth				13106.53	
		Rate of sinking = 0.22 m per hour.			say	13107.00	
		a) Labour					
		Mate	day	0.18	582.53	104.85	L-12
		Sinker	day	1.50	688.44	1032.66	L-15
		Sinking helper (semi-skilled)	day	3.00	582.53	1747.58	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.50	627.54	2823.93	P&M-075
		Consumables in sinking @10 per cent of (b)				282.39	
		c) Overhead charges @ 25% on (a+b)				1497.86	
		d) Contractor's profit @ 16% on (a+b+c)				1198.28	
		Rate per metre = (a+b+c+d)				8687.56	
					say	8688.00	
12.13 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		11th m	5%	9122.00			
		12th m	5%	9578.00			
		13th m	5%	10057.00			
		14th m	5%	10560.00			
	0.165	15th m	5%	11088.00			
		16th m	5%	11642.00			
		17th m	5%	12224.00			
		18th m	5%	12835.00			
		19th m	5%	13477.00			
		20th m	5%	14151.00			
		Total Cost from 10m upto 20m		114734.00			
		Avg Rate per metre		11473.00			
12.13 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge		
		21st m	7.5%	15212.00	18254.00		
		22nd m	7.5%	16353.00	19624.00		
		23rd m	7.5%	17579.00	21095.00		
		24th m	7.5%	18897.00	22676.00		
		25th m	7.5%	20314.00	24377.00		
		26th m	7.5%	21838.00	26206.00		
		27th m	7.5%	23476.00	28171.00		
		28th m	7.5%	25237.00	30284.00		
		29th m	7.5%	27130.00	32556.00		
		30th m	7.5%	29165.00	34998.00		
		Total Cost from 20m upto 30m		215201.00	258241.00		
		Avg Rate per metre		21520.00	25824.00		
12.13 A	(v)	Beyond 30m upto 40 m					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.			Including 20% for Kentledge		
		31st m	10%	32082.00	38498.00		
		32nd	10%	35290.00	42348.00		
		33rd m	10%	38819.00	46583.00		
		34th m	10%	42701.00	51241.00		
		35th m	10%	46971.00	56365.00		
		36th m	10%	51668.00	62002.00		
		37th m	10%	56835.00	68202.00		
		38th m	10%	62519.00	75023.00		
		39th m	10%	68771.00	82525.00		
		40th m	10%	75648.00	90778.00		
		Total Cost from 30m upto 40m		511304.00	613565.00		
		Avg Rate per metre		51130.00	61357.00		
12.13	B	Clayey Soil (7m dia. Well)					
		Unit = Running Meter.					
		Taking output = 1 cum					
	(I)	Depth below bed level upto 3.0 M					
		Rate of sinking = 0.22 m per hour.					
	a)	Labour					
		Mate	day	0.18	582.53	104.85	L-12
		Sinker (skilled)	day	1.50	688.44	1032.66	L-15
		Sinking helper (semi-skilled)	day	3.00	582.53	1747.58	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.50	627.54	2823.93	P&M-075
		Consumables in sinking @ 10 per cent of (b)				282.39	
	d)	Overhead charges @ 25% on (a+b)				1497.86	
	e)	Contractor's profit @ 16% on (a+b+c)				1198.28	
		Rate per metre = (a+b+c+d)				8687.56	
					say	8688.00	
12.13 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking = 0.17 m per hour.					
	a)	Labour					
		Mate	day	0.26	582.53	151.46	L-12
		Sinker	day	2.00	688.44	1376.88	L-15
		Sinking helper (semi-skilled)	day	4.00	582.53	2330.11	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	627.54	3765.24	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.25	288.03	376.52	P&M-063
		Consumables in sinking @ 10 per cent of (b)				414.18	
	c)	Overhead charges @ 25% on (a+b)				2103.60	
	d)	Contractor's profit @ 16% on (a+b+c)				1682.88	
		Rate per metre = (a+b+c+d)				12200.86	
					say	12201.00	
12.13 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 per cent of cost, if required.			Including for dewatering @ 5% of cost, if required		
		11th m	5%	12811.00	13452.00		
		12th m	5%	13452.00	14125.00		
		13th m	5%	14125.00	14831.00		
		14th m	5%	14831.00	15573.00		
		15th m	5%	15573.00	16352.00		

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			16th m	5%	16352.00	17170.00		
			17th m	5%	17170.00	18029.00		
			18th m	5%	18029.00	18930.00		
			19th m	5%	18930.00	19877.00		
			20th m	5%	19877.00	20871.00		
			Total Cost from 10m upto 20m		161150.00	169210.00		
			Avg Rate per metre		<u>16115.00</u>	<u>16921.00</u>		
12.13 B		(iv)	Beyond 20m upto 30 m					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 25% for Kentledge	Including 5% for dewatering, if required	
			31st m	7.5%	21368.00	26710.00	28046.00	
			32nd	7.5%	22971.00	28714.00	30150.00	
			33rd m	7.5%	24694.00	30868.00	32411.00	
			34th m	7.5%	26546.00	33183.00	34842.00	
			35th m	7.5%	28537.00	35671.00	37455.00	
			36th m	7.5%	30677.00	38346.00	40263.00	
			37th m	7.5%	32978.00	41223.00	43284.00	
			38th m	7.5%	35451.00	44314.00	46530.00	
			39th m	7.5%	38110.00	47638.00	50020.00	
			40th m	7.5%	40968.00	51210.00	53771.00	
			Total Cost from 30m upto 40m		302300.00	377877.00	396772.00	
			Avg Rate per metre		<u>30230.00</u>	<u>37788.00</u>	<u>39677.00</u>	
12.13 B		(v)	Beyond 30m upto 40 m					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
			31st m	10%	45065.00	54078.00	56782.00	
			32nd	10%	49572.00	59486.00	62460.00	
			33rd m	10%	54529.00	65435.00	68707.00	
			34th m	10%	59982.00	71978.00	75577.00	
			35th m	10%	65980.00	79176.00	83135.00	
			36th m	10%	72578.00	87094.00	91449.00	
			37th m	10%	79836.00	95803.00	100593.00	
			38th m	10%	87820.00	105384.00	110653.00	
			39th m	10%	96602.00	115922.00	121718.00	
			40th m	10%	106262.00	127514.00	133890.00	
			Total Cost from 30m upto 40m		718226.00	861870.00	904964.00	
			Avg Rate per metre		<u>71823.00</u>	<u>86187.00</u>	<u>90496.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.13		C	Soft Rock (7m dia well)					
			Unit = Running Meter.					
			Taking output = 1 m					
			Depth in soft rock strata upto 3m					
			Rate of sinking = 0.22 m per hour.					
			a) Labour					
			Mate	day	0.58	582.53	337.87	L-12
			Sinker (skilled)	day	4.00	688.44	2753.76	L-15
			Sinking helper (semi-skilled)	day	10.00	582.53	5825.27	L-14
			Diver	day	0.75	794.35	595.77	L-07
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.50	627.54	2823.93	P&M-075
			Air compressor with pneumatic breakers	hour	3.75	288.03	1080.12	P&M-063
			Consumables in sinking @ 10 per cent of (b)				390.41	
			Add for dewatering @ of 5 per cent of (a+b), if required				670.84	
			c) Overhead charges @ 25% on (a+b)				3619.49	
			d) Contractor's profit @ 16% on (a+b+c)				2895.59	
			Rate per metre = (a+b+c+d)				20993.04	
						say	<u>20993.00</u>	
12.13		D	Hard Rock (7m dia well)					
			Unit = Running Meter					
			Taking output = 1 m					
			Depth in Hard rock strata up to 3 m					
			Rate of sinking = 0.17 m per hour.					
			a) Material					
			Gelatine 80 per cent	Kg	7.00	406.76	2847.32	M-104
			Electric Detonators	each	30.00	2.69	80.71	M-094/100
			b) Labour					
			Mate	day	1.60	582.53	932.04	L-12
			Driller	day	2.00	635.48	1270.97	L-06
			Blaster	day	0.25	635.48	158.87	L-03
			Mazdoor	day	18.00	529.57	9532.26	L-13
			Mazdoor (Skilled)	day	4.00	688.44	2753.76	L-15
			Diver	day	0.50	794.35	397.18	L-07
			c) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	627.54	3765.24	P&M-075
			Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.00	288.03	576.07	P&M-063
			Dewatering @ 5 per cent of cost of (b+c), if required.				969.32	
			Consumables in sinking @ 10 per cent of cost of (b).				531.06	
			d) Overhead charges @ 25% on (a+b+c)				5953.70	
			e) Contractor's profit @ 16% on (a+b+c+d)				4762.96	
			Rate per metre = (a+b+c+d+e)				34531.46	
						say	<u>34531.00</u>	
12.14	Section 1200		Sinking of 8 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
			Unit = Running Meter.					
			Taking output = 1 m					
			Diameter of well - 8 m.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	A	Sandy Soil					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.25 m/hour					
		a) Labour					
		Mate	day	0.18	582.53	104.85	L-12
		Sinker (skilled)	day	1.50	688.44	1032.66	L-15
		Sinking helper (semi-skilled)	day	3.00	582.53	1747.58	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	627.54	2510.16	P&M-075
		Consumables in sinking @10 per cent of (b)				251.02	
		c) Overhead charges @ 25% on (a+b)				1411.57	
		d) Contractor's profit @ 16% on (a+b+c)				1129.25	
		Rate per metre = (a+b+c+d)				8187.10	
					say	8187.00	
12.14 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.20 m/hour					
		a) Labour					
		Mate	day	0.25	582.53	145.63	L-12
		Sinker	day	1.75	688.44	1204.77	L-15
		Sinking helper (semi-skilled)	day	3.50	582.53	2038.84	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	627.54	3137.70	P&M-075
		Consumables in sinking @10 per cent of (b)				313.77	
		c) Overhead charges @ 25% on (a+b)				1710.18	
		d) Contractor's profit @ 16% on (a+b+c)				1368.14	
		Rate per metre = (a+b+c+d)				9919.04	
					say	9919.00	
12.14 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		11th m	5%	10415.00			
		12th m	5%	10936.00			
		13th m	5%	11483.00			
		14th m	5%	12057.00			
		15th m	5%	12660.00			
		16th m	5%	13293.00			
		17th m	5%	13958.00			
		18th m	5%	14656.00			
		19th m	5%	15389.00			
		20th m	5%	16158.00			
		Total Cost from 10m upto 20m		131005.00			
		Avg Rate per metre		13101.00			
12.14 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.					
		21st m	7.5%	17370.00	20844.00		
		22nd m	7.5%	18673.00	22408.00		
		23rd m	7.5%	20073.00	24088.00		
		24th m	7.5%	21578.00	25894.00		
		25th m	7.5%	23196.00	27835.00		
		26th m	7.5%	24936.00	29923.00		
		27th m	7.5%	26806.00	32167.00		
		28th m	7.5%	28816.00	34579.00		
		29th m	7.5%	30977.00	37172.00		
		30th m	7.5%	33300.00	39960.00		
		Total Cost from 20m upto 30m		245725.00	294870.00		

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Avg Rate per metre		24573.00	29487.00		
12.14 A		(v)	Beyond 30m upto 40 m					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.			Including 20% for Kentledge		
			31st m	10%	36630.00	43956.00		
			32nd	10%	40293.00	48352.00		
			33rd m	10%	44322.00	53186.00		
			34th m	10%	48754.00	58505.00		
			35th m	10%	53629.00	64355.00		
			36th m	10%	58992.00	70790.00		
			37th m	10%	64891.00	77869.00		
			38th m	10%	71380.00	85656.00		
			39th m	10%	78518.00	94222.00		
			40th m	10%	86370.00	103644.00		
			Total Cost from 30m upto 40m		86370.00	103644.00		
			Avg Rate per metre		8637.00	10364.00		
12.14		B	Clayey Soil (8m dia. Well)					
			<i>Unit = Running Meter.</i>					
			<i>Taking output = 1 meter</i>					
		(i)	Depth from bed level upto 3.0 M					
			Rate of sinking @ 0.18 m/hour					
		a)	Labour					
			Mate	day	0.22	582.53	128.16	L-12
			Sinker (skilled)	day	2.00	688.44	1376.88	L-15
			Sinking helper (semi-skilled)	hour	3.50	582.53	2038.84	L-14
		b)	Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.		5.50	627.54	3451.47	P&M-075
			Consumables in sinking @ 10 per cent of (b)				345.15	
		c)	Overhead charges @ 25% on (a+b)				1835.13	
		d)	Contractor's profit @ 16% on (a+b+c)				1468.10	
			Rate per metre = (a+b+c+d)				10643.73	
						say	10644.00	
12.14 B		(ii)	Beyond 3m upto 10m depth					
			Rate of sinking @ 0.17 m/hour					
		a)	Labour					
			Mate	day	0.32	582.53	186.41	L-12
			Sinker	day	2.50	688.44	1721.10	L-15
			Sinking helper (semi-skilled)	day	4.50	582.53	2621.37	L-14
		b)	Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	627.54	3765.24	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.50	288.03	1008.12	P&M-063
			Consumables in sinking @ 10 per cent of (b)				477.34	
		c)	Overhead charges @ 25% on (a+b)				2444.89	
		d)	Contractor's profit @ 16% on (a+b+c)				1955.92	
			Rate per metre = (a+b+c+d)				14180.38	
						say	14180.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.14 B		(iii)	Beyond 10 m upto 20 m					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.			Including for dewatering @ 5% of cost, if required		
			11th m	5%	14889.00	15633.00		
			12th m	5%	15633.00	16415.00		
			13th m	5%	16415.00	17236.00		
			14th m	5%	17236.00	18098.00		
			15th m	5%	18098.00	19003.00		
			16th m	5%	19003.00	19953.00		
			17th m	5%	19953.00	20951.00		
			18th m	5%	20951.00	21999.00		
			19th m	5%	21999.00	23099.00		
			20th m	5%	23099.00	24254.00		
			Total Cost from 10m upto 20m		187276.00	196641.00		
			Avg Rate per metre		18728.00	19664.00		
12.14 B		(iv)	Beyond 20m upto 30 m					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 25% for Kentledge	Including 5% for dewatering, if required	
			31st m	7.5%	24831.00	31039.00	32591.00	
			32nd	7.5%	26693.00	33366.00	35034.00	
			33rd m	7.5%	28695.00	35869.00	37662.00	
			34th m	7.5%	30847.00	38559.00	40487.00	
			35th m	7.5%	33161.00	41451.00	43524.00	
			36th m	7.5%	35648.00	44560.00	46788.00	
			37th m	7.5%	38322.00	47903.00	50298.00	
			38th m	7.5%	41196.00	51495.00	54070.00	
			39th m	7.5%	44286.00	55358.00	58126.00	
			40th m	7.5%	47607.00	59509.00	62484.00	
			Total Cost from 30m upto 40m		351286.00	439109.00	461064.00	
			Avg Rate per metre		35129.00	43911.00	46106.00	
12.14 B		(v)	Beyond 30m upto 40 m					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
			31st m	10%	52368.00	62842.00	65984.00	
			32nd	10%	57605.00	69126.00	72582.00	
			33rd m	10%	63366.00	76039.00	79841.00	
			34th m	10%	69703.00	83644.00	87826.00	
			35th m	10%	76673.00	92008.00	96608.00	
			36th m	10%	84340.00	101208.00	106268.00	
			37th m	10%	92774.00	111329.00	116895.00	
			38th m	10%	102051.00	122461.00	128584.00	
			39th m	10%	112256.00	134707.00	141442.00	
			40th m	10%	123482.00	148178.00	155587.00	
			Total Cost from 30m upto 40m		834618.00	1001542.00	1051617.00	
			Avg Rate per metre		83462.00	100154.00	105162.00	
12.14		C	Soft Rock (8m dia well)					
			Unit = Running Meter.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Taking output = 1 m					
		Depth in soft rock strata upto 3m					
		Rate of sinking @ 0.20 m/hour					
		a) Labour					
		Mate	day	0.68	582.53	396.12	L-12
		Sinker (skilled)	day	4.00	688.44	2753.76	L-15
		Sinking helper (semi-skilled)	day	12.00	582.53	6990.32	L-14
		Diver	day	1.00	794.35	794.35	L-07
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	627.54	3137.70	P&M-075
		Air compressor with pneumatic breakers	hour	3.75	288.03	1080.12	P&M-063
		Consumables in sinking @ 10 per cent of (b)				421.78	
		Add for dewatering @ of 5 per cent of (a+b), if required				778.71	
		c) Overhead charges @ 25% on (a+b)				4088.22	
		d) Contractor's profit @ 16% on (a+b+c)				3270.58	
		Rate per metre = (a+b+c+d)				23711.67	
					say	<u>23712.00</u>	
12.14	D	Hard Rock (8m dia well)					
		Unit = Running Meter					
		Taking output = 1 m					
		Depth in hard rock strata upto 3 m					
		Rate of sinking @ 0.17 m/hour					
		a) Material					
		Gelatine 80 per cent	Kg	8.00	406.76	3254.08	M-104
		Electric Detonators	each	32.00	2.69	86.09	M-094/100
		b) Labour					
		Mate	day	1.09	582.53	634.95	L-12
		Driller	day	2.00	635.48	1270.97	L-06
		Blaster	day	0.25	635.48	158.87	L-03
		Mazdoor	day	20.00	529.57	10591.40	L-13
		Mazdoor (Skilled)	day	4.00	688.44	2753.76	L-15
		c) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	627.54	3765.24	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.00	288.03	576.07	P&M-063
		Dewatering @ 5 per cent of cost of (b+c), if required.				987.56	
		Consumables in sinking @ 10 per cent of cost of (b).				1541.00	
		d) Overhead charges @ 25% on (a+b+c)				6405.00	
		e) Contractor's profit @ 16% on (a+b+c+d)				5124.00	
		Rate per metre = (a+b+c+d+e)				37148.99	
					say	<u>37149.00</u>	
12.15	Section 1200	Sinking of 9 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
		Unit = Running Meter.					
		Taking output = 1 m					
		Diameter of well - 9 m.					
	A	Sandy Soil					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.25 m/hour					
		a) Labour					
		Mate	day	0.19	582.53	110.68	L-12
		Sinker (skilled)	day	1.50	688.44	1032.66	L-15
		Sinking helper (semi-skilled)	day	3.25	582.53	1893.21	L-14
		b) Machinery					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	627.54	2510.16	P&M-075
		Consumables in sinking @10 per cent of (b)				251.02	
		c) Overhead charges @ 25% on (a+b)				1449.43	
		d) Contractor's profit @ 16% on (a+b+c)				1159.55	
		Rate per metre = (a+b+c+d)				8406.71	
					say	<u>8407.00</u>	
12.15 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.18 m/hour					
		a) Labour					
		Mate	day	0.27	582.53	157.28	L-12
		Sinker	day	1.75	688.44	1204.77	L-15
		Sinking helper (semi-skilled)	day	4.00	582.53	2330.11	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.50	627.54	3451.47	P&M-075
		Consumables in sinking @10 per cent of (b)				345.15	
		c) Overhead charges @ 25% on (a+b)				1872.20	
		d) Contractor's profit @ 16% on (a+b+c)				1497.76	
		Rate per metre = (a+b+c+d)				10858.73	
					say	<u>10859.00</u>	
12.15 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		11th m	5%	11402.00			
		12th m	5%	11972.00			
		13th m	5%	12571.00			
		14th m	5%	13200.00			
		15th m	5%	13860.00			
		16th m	5%	14553.00			
		17th m	5%	15281.00			
		18th m	5%	16045.00			
		19th m	5%	16847.00			
		20th m	5%	17689.00			
		Total Cost from 10m upto 20m		143420.00			
		Avg Rate per metre		<u>14342.00</u>			
12.15 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.				Including 20% for Kentledge	
		21st m	7.5%	19015.68		22819.00	
		22nd m	7.5%	20442.00		24530.00	
		23rd m	7.5%	21975.00		26370.00	
		24th m	7.5%	23623.00		28348.00	
		25th m	7.5%	25395.00		30474.00	
		26th m	7.5%	27300.00		32760.00	
		27th m	7.5%	29348.00		35218.00	
		28th m	7.5%	31549.00		37859.00	
		29th m	7.5%	33915.00		40698.00	
		30th m	7.5%	36459.00		43751.00	
		Total Cost from 20m upto 30m		269021.68		322827.00	
		Avg Rate per metre		<u>26902.00</u>		<u>32283.00</u>	
12.15 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.				Including 20% for Kentledge	
		31st m	10%	40104.90		48126.00	
		32nd m	10%	44115.00		52938.00	
		33rd m	10%	48527.00		58232.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		34th m	10%	53380.00	64056.00		
		35th m	10%	58718.00	70462.00		
		36th m	10%	64590.00	77508.00		
		37th m	10%	71049.00	85259.00		
		38th m	10%	78154.00	93785.00		
		39th m	10%	85969.00	103163.00		
		40th m	10%	94566.00	113479.00		
		Total Cost from 30m upto 40m		639172.90	767008.00		
		Avg Rate per metre		<u>63917.00</u>	<u>76701.00</u>		
12.15	B	Clayey Soil (9m dia. Well)					
		<i>Unit = Running Meter.</i>					
		<i>Taking output = 1 cum</i>					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking 0.17 m / hour					
		a) Labour					
		Mate	day	0.24	582.53	139.81	L-12
		Sinker (skilled)	day	2.25	688.44	1548.99	L-15
		Sinking helper (semi-skilled)	day	3.75	582.53	2184.48	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.75	627.54	3608.36	P&M-075
		Consumables in sinking @ 10 per cent of (b)				360.84	
		c) Overhead charges @ 25% on (a+b)				1960.62	
		d) Contractor's profit @ 16% on (a+b+c)				1568.49	
		Rate per metre = (a+b+c+d)				11371.58	
					say	<u>11372.00</u>	
12.15 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking 0.15 m / hour					
		a) Labour					
		Mate	day	0.34	582.53	198.06	L-12
		Sinker	day	2.50	688.44	1721.10	L-15
		Sinking helper (semi-skilled)	day	5.00	582.53	2912.63	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.50	627.54	4079.01	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.75	288.03	1080.12	P&M-063
		Consumables in sinking @ 10 per cent of (b)				515.91	
		c) Overhead charges @ 25% on (a+b)				2626.71	
		d) Contractor's profit @ 16% on (a+b+c)				2101.37	
		Rate per metre = (a+b+c+d)				15234.93	
					say	<u>15235.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.15 B		(iii)	Beyond 10 m upto 20 m					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.			Including for dewatering @ 5% of cost, if required		
			11th m	5%	15997.00	16797.00		
			12th m	5%	16797.00	17637.00		
			13th m	5%	17637.00	18519.00		
			14th m	5%	18519.00	19445.00		
			15th m	5%	19445.00	20417.00		
			16th m	5%	20417.00	21438.00		
			17th m	5%	21438.00	22510.00		
			18th m	5%	22510.00	23636.00		
			19th m	5%	23636.00	24818.00		
			20th m	5%	24818.00	26059.00		
			Total Cost from 10m upto 20m		201214.00	211276.00		
			Avg Rate per metre		20121.00	21128.00		
12.15 B		(iv)	Beyond 20m upto 30 m					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 25% for Kentledge	Including 5% for dewatering, if required	
			31st m	7.5%	26679.00	33349.00	35016.00	
			32nd	7.5%	28680.00	35850.00	37643.00	
			33rd m	7.5%	30831.00	38539.00	40466.00	
			34th m	7.5%	33143.00	41429.00	43500.00	
			35th m	7.5%	35629.00	44536.00	46763.00	
			36th m	7.5%	38301.00	47876.00	50270.00	
			37th m	7.5%	41174.00	51468.00	54041.00	
			38th m	7.5%	44262.00	55328.00	58094.00	
			39th m	7.5%	47582.00	59478.00	62452.00	
			40th m	7.5%	51151.00	63939.00	67136.00	
			Total Cost from 30m upto 40m		377432.00	471792.00	495381.00	
			Avg Rate per metre		37743.00	47179.00	49538.00	
12.15 B		(v)	Beyond 30m upto 40 m					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
			31st m	10%	56266.00	67519.00	70895.00	
			32nd	10%	61893.00	74272.00	77986.00	
			33rd m	10%	68082.00	81698.00	85783.00	
			34th m	10%	74890.00	89868.00	94361.00	
			35th m	10%	82379.00	98855.00	103798.00	
			36th m	10%	90617.00	108740.00	114177.00	
			37th m	10%	99679.00	119615.00	125596.00	
			38th m	10%	109647.00	131576.00	138155.00	
			39th m	10%	120612.00	144734.00	151971.00	
			40th m	10%	132673.00	159208.00	167168.00	
			Total Cost from 30m upto 40m		896738.00	1076085.00	1129890.00	
			Avg Rate per metre		89674.00	107609.00	112989.00	
12.15		C	Soft Rock (9m dia well)					
			Unit = Running Meter.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Taking output = 1 m					
		Depth in soft rock strata up to 3m					
		Rate of sinking 0.15 m / hour					
		a) Labour					
		Mate	day	0.76	582.53	442.72	L-12
		Sinker (skilled)	day	4.00	688.44	2753.76	L-15
		Sinking helper (semi-skilled)	day	14.00	582.53	8155.38	L-14
		Diver	day	1.20	794.35	953.23	L-07
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.50	627.54	4079.01	P&M-075
		Air compressor with pneumatic breakers	hour	4.00	288.03	1152.13	P&M-063
		Consumables in sinking @ 10 per cent of (b)				523.11	
		Add for dewatering @ of 5 per cent of (a+b), if required				1805.93	
		c) Overhead charges @ 25% on (a+b)				4966.32	
		d) Contractor's profit @ 16% on (a+b+c)				3973.06	
		Rate per metre = (a+b+c+d)				28804.65	
					say	<u>28805.00</u>	
12.15	D	Hard Rock (9m dia well)					
		Unit = Running Meter					
		Taking output = 1 m					
		Depth in hard rock strata upto 3 m					
		Rate of sinking 0.15 m / hour					
		a) Material					
		Gelatine 80 per cent	Kg	10.00	406.76	4067.61	M-104
		Electric Detonators	each	40.00	2.69	107.61	M-094/100
		b) Labour					
		Mate	day	1.17	582.53	681.56	L-12
		Driller	day	2.00	635.48	1270.97	L-06
		Blaster	day	0.25	635.48	158.87	L-03
		Mazdoor	day	22.00	529.57	11650.54	L-13
		Mazdoor (Skilled)	day	4.00	688.44	2753.76	L-15
		Diver	day	1.00	794.35	794.35	L-07
		c) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	7.00	627.54	4392.78	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.50	288.03	720.08	P&M-063
		Dewatering @ 5 per cent of cost of (b+c), if required.				1121.15	
		Consumables in sinking @ 10 per cent of cost of (b).				1731.01	
		d) Overhead charges @ 25% on (a+b+c)				7362.57	
		e) Contractor's profit @ 16% on (a+b+c+d)				5890.06	
		Rate per metre = (a+b+c+d+e)				42702.91	
					say	<u>42703.00</u>	
12.16	1200	Sinking of 10 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
		Unit = Running Meter					
		Taking output = 1 m					
		Diameter of well - 10 m.					
	A	Sandy Soil					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking 0.20 m / hour					
		a) Labour					
		Mate	day	0.20	582.53	116.51	L-12
		Sinker (skilled)	day	1.50	688.44	1032.66	L-15
		Sinking helper (semi-skilled)	day	3.50	582.53	2038.84	L-14

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	627.54	3137.70	P&M-075
		Consumables in sinking @10 per cent of (b)				313.77	
		c) Overhead charges @ 25% on (a+b)				1659.87	
		d) Contractor's profit @ 16% on (a+b+c)				1327.90	
		Rate per metre = (a+b+c+d)				9627.25	
					say	9627.00	
12.16 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking 0.17 m / hour					
		a) Labour					
		Mate	day	0.31	582.53	180.58	L-12
		Sinker	day	2.00	688.44	1376.88	L-15
		Sinking helper (semi-skilled)	day	4.25	582.53	2475.74	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.75	627.54	3608.36	P&M-075
		Consumables in sinking @10 per cent of (b)				360.84	
		c) Overhead charges @ 25% on (a+b)				2000.60	
		d) Contractor's profit @ 16% on (a+b+c)				1600.48	
		Rate per metre = (a+b+c+d)				11603.48	
					say	11603.00	
12.16 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		11th m	5%	12184.00			
		12th m	5%	12793.00			
		13th m	5%	13433.00			
		14th m	5%	14105.00			
		15th m	5%	14810.00			
		16th m	5%	15551.00			
		17th m	5%	16329.00			
		18th m	5%	17145.00			
		19th m	5%	18002.00			
		20th m	5%	18902.00			
		Total Cost from 10m upto 20m		153254.00			
		Avg Rate per metre		15325.00			
12.16 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.				Including 20% for Kentledge	
		21st m	7.5%	20320.00		24384.00	
		22nd m	7.5%	21844.00		26213.00	
		23rd m	7.5%	23482.00		28178.00	
		24th m	7.5%	25243.00		30292.00	
		25th m	7.5%	27136.00		32563.00	
		26th m	7.5%	29171.00		35005.00	
		27th m	7.5%	31359.00		37631.00	
		28th m	7.5%	33711.00		40453.00	
		29th m	7.5%	36239.00		43487.00	
		30th m	7.5%	38957.00		46748.00	
		Total Cost from 20m upto 30m		287462.00		344954.00	
		Avg Rate per metre		28746.00		34495.00	
12.16 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.				Including 20% for Kentledge	
		31st m	10%	42853.00		51424.00	
		32nd	10%	47138.00		56566.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		33rd m	10%	51852.00	62222.00		
		34th m	10%	57037.00	68444.00		
		35th m	10%	62741.00	75289.00		
		36th m	10%	69015.00	82818.00		
		37th m	10%	75917.00	91100.00		
		38th m	10%	83509.00	100211.00		
		39th m	10%	91860.00	110232.00		
		40th m	10%	101046.00	121255.00		
		Total Cost from 30m upto 40m		682968.00	819561.00		
		Avg Rate per metre		68297.00	81956.00		
12.16	B	Clayey Soil (10m dia. Well)					
		Unit = Running Meter					
		Taking output = 1 cum					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking 0.18m/hour.					
		a) Labour					
		Mate	day	0.25	582.53	145.63	L-12
		Sinker (skilled)	day	2.50	688.44	1721.10	L-15
		Sinking helper (semi-skilled)	day	5.50	582.53	3203.90	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	627.54	3765.24	P&M-075
		Consumables in sinking @ 10 per cent of (b)				376.52	
		c) Overhead charges @ 25% on (a+b)				2303.10	
		d) Contractor's profit @ 16% on (a+b+c)				1842.48	
		Rate per metre = (a+b+c+d)				13357.98	
					say	13358.00	
12.16 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking 0.15m/hour.					
		a) Labour					
		Mate	day	0.40	582.53	233.01	L-12
		Sinker	day	3.00	688.44	2065.32	L-15
		Sinking helper (semi-skilled)	day	5.50	582.53	3203.90	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	627.54	3765.24	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay	hour	4.00	288.03	1152.13	P&M-063
		Consumables in sinking @ 10 per cent of (b)				491.74	
		c) Overhead charges @ 25% on (a+b)				2727.84	
		d) Contractor's profit @ 16% on (a+b+c)				2182.27	
		Rate per metre = (a+b+c+d)				15821.45	
					say	15821.00	
12.16 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 per cent of cost, if required.					
					Including for dewatering @ 5% of cost, if required		
		11th m	5%	16613.00	17444.00		
		12th m	5%	17444.00	18316.00		
		13th m	5%	18316.00	19232.00		
		14th m	5%	19232.00	20194.00		
		15th m	5%	20194.00	21204.00		
		16th m	5%	21204.00	22264.00		
		17th m	5%	22264.00	23377.00		
		18th m	5%	23377.00	24546.00		
		19th m	5%	24546.00	25773.00		
		20th m	5%	25773.00	27062.00		
		Total Cost from 10m upto 20m		208963.00	219412.00		

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Avg Rate per metre		20896.00	21941.00		
12.16 B		(iv)	Beyond 20m upto 30 m					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 25% for Kentledge	Including 5% for dewatering, if required	
			31st m	7.5%	27706.00	34633.00	36365.00	
			32nd	7.5%	29784.00	37230.00	39092.00	
			33rd m	7.5%	32018.00	40023.00	42024.00	
			34th m	7.5%	34419.00	43024.00	45175.00	
			35th m	7.5%	37000.00	46250.00	48563.00	
			36th m	7.5%	39775.00	49719.00	52205.00	
			37th m	7.5%	42758.00	53448.00	56120.00	
			38th m	7.5%	45965.00	57456.00	60329.00	
			39th m	7.5%	49412.00	61765.00	64853.00	
			40th m	7.5%	53118.00	66398.00	69718.00	
			Total Cost from 30m upto 40m		391955.00	489946.00	514444.00	
			Avg Rate per metre		39196.00	48995.00	51444.00	
12.16 B		(v)	Beyond 30m upto 40 m					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
			31st m	10%	58430.00	70116.00	73622.00	
			32nd	10%	64273.00	77128.00	80984.00	
			33rd m	10%	70700.00	84840.00	89082.00	
			34th m	10%	77770.00	93324.00	97990.20	
			35th m	10%	85547.00	102656.00	107788.80	
			36th m	10%	94102.00	112922.00	118568.10	
			37th m	10%	103512.00	124214.00	130424.70	
			38th m	10%	113863.00	136636.00	143467.80	
			39th m	10%	125249.00	150299.00	157813.95	
			40th m	10%	137774.00	165329.00	173595.45	
			Total Cost from 30m upto 40m		931220.00	1117464.00	1173337.00	
			Avg Rate per metre		93122.00	111746.00	117334.00	
12.16		C	Soft Rock (10m dia well)					
			Unit = Running Meter.					
			Taking output = 1 m					
			Depth in soft rock strata upto 3m					
			Rate of sinking 0.14m/hour.					
		a)	Labour					
			Mate	day	0.86	582.53	500.97	L-12
			Sinker (skilled)	day	4.00	688.44	2753.76	L-15
			Sinking helper (semi-skilled)	day	16.00	582.53	9320.43	L-14
			Diver	day	1.40	794.35	1112.10	L-07
		b)	Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	7.00	627.54	4392.78	P&M-075
			Air compressor with pneumatic breakers	hour	4.25	288.03	1224.14	P&M-063
			Consumables in sinking @ 10 per cent of (b)				561.69	
			Add for dewatering @ 5 per cent of cost, if required				308.93	
		c)	Overhead charges @ 25% on (a+b)				5043.70	
		d)	Contractor's profit @ 16% on (a+b+c)				4034.96	
			Rate per metre = (a+b+c+d)				29253.47	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
						say	<u>29253.00</u>	
12.16		D	Hard Rock (10m dia well)					
			Unit = Running Meter.					
			Taking output = 1 m					
			Depth in hard rock strata upto 3 m					
			Rate of sinking 0.12 m/ hour.					
			a) Material					
			Gelatine 80 per cent	Kg	11.00	406.76	4474.37	M-104
			Electric Detonators	each.	44.00	2.69	118.37	M-094/100
			b) Labour					
			Mate	day	1.27	582.53	739.81	L-12
			Driller	day	2.00	635.48	1270.97	L-06
			Blaster	day	0.25	635.48	158.87	L-03
			Mazdoor	day	24.00	529.57	12709.68	L-13
			Mazdoor (Skilled)	day	4.00	688.44	2753.76	L-15
			c) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.50	627.54	5334.09	P&M-075
			Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	3.00	288.03	864.10	P&M-063
			Dewatering @ 5 per cent of cost (c), if required.				309.91	
			Consumables in sinking @ 10 per cent of cost of (b+c).				2414.12	
			d) Overhead charges @ 25% on (a+b+c)				7787.01	
			e) Contractor's profit @ 16% on (a+b+c+d)				6229.61	
			Rate per metre = (a+b+c+d+e)				45164.66	
						say	<u>45165.00</u>	
12.17	1200		Sinking of 11 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
			Unit = Running Meter					
			Taking output = 0.50 m					
			Diameter of well - 11 m.					
		A	Sandy Soil					
		(i)	Depth from bed level upto 3.0 M					
			Rate of sinking @ 0.15 m/hour					
			a) Labour					
			Mate	day	0.21	582.53	122.33	L-12
			Sinker (skilled)	day	1.50	688.44	1032.66	L-15
			Sinking helper (semi-skilled)	day	3.30	582.53	1922.34	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	627.54	3765.24	P&M-075
			Consumables in sinking @10 per cent of (b)				376.52	
			d) Overhead charges @ 25% on (a+b+c)				1804.77	
			e) Contractor's profit @ 16% on (a+b+c+d)				1443.82	
			Cost for 0.5m = a+b+c+d				10467.69	
			Rate per metre = (a+b+c+d)/0.50				20935.38	
						say	<u>20935.00</u>	
12.17 A		(ii)	Beyond 3m upto 10m depth					
			Rate of sinking @ 0.13 m/hour					
			a) Labour					
			Mate	day	0.32	582.53	186.41	L-12
			Sinker	day	2.00	688.44	1376.88	L-15
			Sinking helper (semi-skilled)	day	4.50	582.53	2621.37	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	627.54	2510.16	P&M-075

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Consumables in sinking @10 per cent of (b)				251.02	
		c) Overhead charges @ 25% on (a+b+c)				1736.46	
		d) Contractor's profit @ 16% on (a+b+c+d)				1389.17	
		Cost for 0.5m = a+b+c+d				10071.47	
		Rate per metre = (a+b+c+d)/0.50				20142.93	
					say	<u>20143.00</u>	
12.17 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		11th m	5%	21150.00			
		12th m	5%	22208.00			
		13th m	5%	23318.00			
		14th m	5%	24484.00			
		15th m	5%	25708.00			
		16th m	5%	26993.00			
		17th m	5%	28343.00			
		18th m	5%	29760.00			
		19th m	5%	31248.00			
		20th m	5%	32810.00			
		Total Cost from 10m upto 20m		266022.00			
		Avg Rate per metre		<u>26602.00</u>			
12.17 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.			Including 20% for Kentledge		
		21st m	7.5%	35271.00	42325.00		
		22nd m	7.5%	37916.00	45499.00		
		23rd m	7.5%	40760.00	48912.00		
		24th m	7.5%	43817.00	52580.00		
		25th m	7.5%	47103.00	56524.00		
		26th m	7.5%	50636.00	60763.00		
		27th m	7.5%	54434.00	65321.00		
		28th m	7.5%	58517.00	70220.00		
		29th m	7.5%	62906.00	75487.00		
		30th m	7.5%	67624.00	81149.00		
		Total Cost from 20m upto 30m		498984.00	598780.00		
		Avg Rate per metre		<u>49898.00</u>	<u>59878.00</u>		
12.17 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.			Including 20% for Kentledge		
		31st m	10%	74386.00	89263.00		
		32nd	10%	81825.00	98190.00		
		33rd m	10%	90008.00	108010.00		
		34th m	10%	99009.00	118811.00		
		35th m	10%	108910.00	130692.00		
		36th m	10%	119801.00	143761.00		
		37th m	10%	131781.00	158137.00		
		38th m	10%	144959.00	173951.00		
		39th m	10%	159455.00	191346.00		
		40th m	10%	175401.00	210481.00		
		Total Cost from 30m upto 40m		1185535.00	1422642.00		
		Avg Rate per metre		<u>118554.00</u>	<u>142264.00</u>		
12.17	B	Clayey Soil (11 m dia. Well)					
		Unit = Running Meter					
		Taking output = 0.50 meter					
	(i)	Depth from bed level upto 3.0 M					
		Rate of sinking @ 0.10 m/hour					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.26	582.53	151.46	L-12
		Sinker (skilled)	day	2.50	688.44	1721.10	L-15
		Sinking helper (semi-skilled)	day	4.00	582.53	2330.11	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	627.54	3137.70	P&M-075
		Consumables in sinking @ 10 per cent of (b)				313.77	
		c) Overhead charges @ 25% on (a+b)				1913.53	
		d) Contractor's profit @ 16% on (a+b+c)				1530.83	
		Cost for 0.5m = a+b+c+d				11098.50	
		Rate per metre = (a+b+c+d)/0.50				22197.00	
					say	<u>22197.00</u>	
12.17 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.08 m/hour					
		a) Labour					
		Mate	day	0.43	582.53	250.49	L-12
		Sinker	day	3.50	688.44	2409.54	L-15
		Sinking helper (semi-skilled)	day	5.75	582.53	3349.53	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	627.54	3765.24	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay	hour	4.25	288.03	1224.14	P&M-063
		Consumables in sinking @ 10 per cent of (b)				498.94	
		c) Overhead charges @ 25% on (a+b)				2874.47	
		d) Contractor's profit @ 16% on (a+b+c)				2299.58	
		Cost for 0.5m = a+b+c+d				16671.93	
		Rate per metre = (a+b+c+d)/0.50				33343.85	
					say	<u>33344.00</u>	
12.17 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 per cent of cost, if required.					
		11th m	5%	35011.00	36762.00		
		12th m	5%	36762.00	38600.00		
		13th m	5%	38600.00	40530.00		
		14th m	5%	40530.00	42557.00		
		15th m	5%	42557.00	44685.00		
		16th m	5%	44685.00	46919.00		
		17th m	5%	46919.00	49265.00		
		18th m	5%	49265.00	51728.00		
		19th m	5%	51728.00	54314.00		
		20th m	5%	54314.00	57030.00		
		Total Cost from 10m upto 20m		440371.00	462390.00		
		Avg Rate per metre		<u>44037.00</u>	<u>46239.00</u>		
12.17 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 per cent of cost for dewatering on the cost, if required					
	c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour).					
		31st m	7.5%	58388.00	72985.00	76634.00	
		32nd	7.5%	62767.00	78459.00	82382.00	
		33rd m	7.5%	67475.00	84344.00	88561.00	
		34th m	7.5%	72536.00	90670.00	95204.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		35th m	7.5%	77976.00	97470.00	102344.00	
		36th m	7.5%	83824.00	104780.00	110019.00	
		37th m	7.5%	90111.00	112639.00	118271.00	
		38th m	7.5%	96869.00	121086.00	127140.00	
		39th m	7.5%	104134.00	130168.00	136676.00	
		40th m	7.5%	111944.00	139930.00	146927.00	
		Total Cost from 30m upto 40m		826024.00	1032531.00	1084158.00	
		Avg Rate per metre		82602.00	103253.00	108416.00	
12.17 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 per cent of cost for dewatering, if required					
	c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
		31st m	10%	123138.00	147766.00	155154.00	
		32nd	10%	135452.00	162542.00	170669.00	
		33rd m	10%	148997.00	178796.00	187736.00	
		34th m	10%	163897.00	196676.00	206510.00	
		35th m	10%	180287.00	216344.00	227161.00	
		36th m	10%	198316.00	237979.00	249878.00	
		37th m	10%	218148.00	261778.00	274867.00	
		38th m	10%	239963.00	287956.00	302354.00	
		39th m	10%	263959.00	316751.00	332589.00	
		40th m	10%	290355.00	348426.00	365847.00	
		Total Cost from 30m upto 40m		1962512	2355014	2472765	
		Avg Rate per metre		196251.00	235501.00	247277.00	
12.17	C	Soft Rock (11m dia well)					
		Unit = Running Meter.					
		Taking output = 0.50 m					
		Depth in soft rock strata upto 3m					
		Rate of sinking @ 0.06 m/hour					
		a) Labour					
		Mate	day	0.95	582.53	553.40	L-12
		Sinker (skilled)	day	4.25	688.44	2925.87	L-15
		Sinking helper (semi-skilled)	day	18.00	582.53	10485.48	L-14
		Diver	day	1.50	794.35	1191.53	L-07
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.00	627.54	5020.32	P&M-075
		Air compressor with pneumatic breakers	hour	4.50	288.03	1296.15	P&M-063
		Consumables in sinking @ 10 per cent of (b)				631.65	
		Add for dewatering @ 5 per cent of cost, if required				347.41	
		c) Overhead charges @ 25% on (a+b)				5612.95	
		d) Contractor's profit @ 16% on (a+b+c)				4490.36	
		Cost for 0.5m = a+b+c+d				32555.13	
		Rate per metre = (a+b+c+d)/0.50				65110.26	
					say	65110.00	
12.17	D	Hard Rock (11m dia well)					
		Unit = Running Meter.					
		Taking output = 0.50 m					
		Depth in hard rock upto 3 m					
		Rate of sinking @ 0.05 m/hour					
		a) Material					
		Gelatine 80 per cent	Kg	12.00	406.76	4881.13	M-104
		Electric Detonators	each.	48.00	2.69	129.13	M-094/100
		b) Labour					
		Mate	day	1.35	582.53	786.41	L-12
		Driller	day	2.00	635.48	1270.97	L-06

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Blaster	day	0.25	635.48	158.87	L-03
		Mazdoor	day	26.00	529.57	13768.82	L-13
		Mazdoor (Skilled)	day	4.00	688.44	2753.76	L-15
		c) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	10.00	627.54	6275.40	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	3.50	288.03	1008.12	P&M-063
		Dewatering @ 5 per cent of cost (c), if required.				364.18	
		Consumables in sinking @ 10 per cent of cost of (b+c).				2602.23	
		d) Overhead charges @ 25% on (a+b+c)				8499.75	
		e) Contractor's profit @ 16% on (a+b+c+d)				6799.80	
		Cost for 0.5m = a+b+c+d				49298.57	
		Rate per metre = (a+b+c+d)/0.50				98597.15	
					say	98597.00	
12.18	1200	Sinking of 12 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 0.25 m</i>					
		Diameter of well - 12 m.					
	A	Sandy Soil					
	(i)	I) Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.05 m/hour					
		a) Labour					
		Mate	day	0.22	582.53	128.16	L-12
		Sinker (skilled)	day	1.75	688.44	1204.77	L-15
		Sinking helper (semi-skilled)	day	4.00	582.53	2330.11	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	627.54	3765.24	P&M-075
		Consumables in sinking @10 per cent of (b)				376.52	
		c) Overhead charges @ 25% on (a+b)				1951.20	
		d) Contractor's profit @ 16% on (a+b+c)				1560.96	
		Cost for 0.25m = a+b+c+d				11316.96	
		Rate per metre = (a+b+c+d)/0.25				45267.85	
					say	45268.00	
12.18 A		(ii) Beyond 3m upto 10m depth					
		Rate of sinking @ 0.038 m/hour					
		a) Labour					
		Mate	day	0.37	582.53	215.53	L-12
		Sinker	day	2.50	688.44	1721.10	L-15
		Sinking helper (semi-skilled)	day	4.75	582.53	2767.00	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.50	627.54	4079.01	P&M-075
		Consumables in sinking @10 per cent of (b)				407.90	
		c) Overhead charges @ 25% on (a+b)				2297.64	
		d) Contractor's profit @ 16% on (a+b+c)				1838.11	
		Cost for 0.25m = a+b+c+d				13326.30	
		Rate per metre = (a+b+c+d)/0.25				53305.21	
					say	53305.00	
12.18 A		(iii) Beyond 10m upto 20m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		11th m	5%	55970.00			
		12th m	5%	58769.00			
		13th m	5%	61707.45			

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			14th m	5%	64792.82			
			15th m	5%	68032.46			
			16th m	5%	71434.09			
			17th m	5%	75005.79			
			18th m	5%	78756.08			
			19th m	5%	82693.88			
			20th m	5%	86828.58			
			Total Cost from 10m upto 20m		703990.16			
			Avg Rate per metre		<u>70399.00</u>			

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.18 A		(iv)	Beyond 20m upto 30 m					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.			Including 20% for Kentledge		
			21st m	7.5%	93341.00	112009.00		
			22nd m	7.5%	100342.00	120410.00		
			23rd m	7.5%	107868.00	129442.00		
			24th m	7.5%	115958.00	139150.00		
			25th m	7.5%	124655.00	149586.00		
			26th m	7.5%	134004.00	160805.00		
			27th m	7.5%	144054.00	172865.00		
			28th m	7.5%	154858.00	185830.00		
			29th m	7.5%	166472.00	199766.00		
			30th m	7.5%	178957.00	214748.00		
			Total Cost from 20m upto 30m		1320509.00	1584611.00		
			Avg Rate per metre		132051.00	158461.00		
12.18 A		(v)	Beyond 30m upto 40 m					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.			Including 20% for Kentledge		
			31st m	10%	196853.00	236224.00		
			32nd	10%	216538.00	259846.00		
			33rd m	10%	238192.00	285830.00		
			34th m	10%	262011.00	314413.00		
			35th m	10%	288212.00	345854.00		
			36th m	10%	317033.00	380440.00		
			37th m	10%	348736.00	418483.00		
			38th m	10%	383610.00	460332.00		
			39th m	10%	421971.00	506365.00		
			40th m	10%	464168.00	557002.00		
			Total Cost from 30m upto 40m		3137324	3764789		
			Avg Rate per metre		313732.00	376479.00		
12.18		B	Clayey Soil (12 m dia. Well)					
			Unit = Running Meter.					
			Taking output = 0.25 meter.					
		(i)	Depth below bed level upto 3.0 M					
			Rate of sinking @ 0.04 m/hour					
		a)	Labour					
			Mate	day	0.30	582.53	174.76	L-12
			Sinker (skilled)	day	3.00	688.44	2065.32	L-15
			Sinking helper (semi-skilled)	day	4.50	582.53	2621.37	L-14
		b)	Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.25	627.54	3922.13	P&M-075
			Consumables in sinking @ 10 per cent of (b)				392.21	
		c)	Overhead charges @ 25% on (a+b)				2293.95	
		d)	Contractor's profit @ 16% on (a+b+c)				1835.16	
			Cost for 0.25m = a+b+c+d				13304.90	
			Rate per metre = (a+b+c+d)/0.25				53219.59	
						say	53220.00	
12.18 B		(ii)	Beyond 3m upto 10m depth					
			Rate of sinking @ 0.03 m/hour					
		a)	Labour					
			Mate	day	0.48	582.53	279.61	L-12
			Sinker	day	3.75	688.44	2581.65	L-15
			Sinking helper (semi-skilled)	day	6.00	582.53	3495.16	L-14
		b)	Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.33	627.54	5227.41	P&M-075

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.50	288.03	1296.15	P&M-063
		Consumables in sinking @ 10 per cent of (b)				652.36	
		c) Overhead charges @ 25% on (a+b)				3383.09	
		d) Contractor's profit @ 16% on (a+b+c)				2706.47	
		Cost for 0.25m = a+b+c+d				19621.90	
		Rate per metre = (a+b+c+d)/0.25				78487.59	
					say	<u>78488.00</u>	
12.18 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 per cent of cost, if required.			Including for dewatering @ 5% of cost, if required		
		11th m	5%	82412.00	86533.00		
		12th m	5%	86533.00	90860.00		
		13th m	5%	90860.00	95403.00		
		14th m	5%	95403.00	100173.00		
		15th m	5%	100173.00	105182.00		
		16th m	5%	105182.00	110441.00		
		17th m	5%	110441.00	115963.00		
		18th m	5%	115963.00	121761.00		
		19th m	5%	121761.00	127849.00		
		20th m	5%	127849.00	134241.00		
		Total Cost from 10m upto 20m		1036577.00	1088406.00		
		Avg Rate per metre		<u>103658.00</u>	<u>108841.00</u>		
12.18 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 per cent of cost for dewatering on the cost, if required					
	c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 25% for Kentledge	Including 5% for dewatering, if required	
		31st m	7.5%	137438.00	171798.00	180388.00	
		32nd	7.5%	147746.00	184683.00	193917.00	
		33rd m	7.5%	158827.00	198534.00	208461.00	
		34th m	7.5%	170739.00	213424.00	224095.00	
		35th m	7.5%	183544.00	229430.00	240902.00	
		36th m	7.5%	197310.00	246638.00	258970.00	
		37th m	7.5%	212108.00	265135.00	278392.00	
		38th m	7.5%	228016.00	285020.00	299271.00	
		39th m	7.5%	245117.00	306396.00	321716.00	
		40th m	7.5%	263501.00	329376.00	345845.00	
		Total Cost from 30m upto 40m		1944346	2430434	2551957	
		Avg Rate per metre		<u>194435.00</u>	<u>243043.00</u>	<u>255196.00</u>	
12.18 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 per cent of cost for dewatering, if required					
	c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
		31st m	10%	289851.00	347821.00	365212.00	
		32nd	10%	318836.00	382603.00	401733.00	
		33rd m	10%	350720.00	420864.00	441907.00	
		34th m	10%	385792.00	462950.00	486098.00	
		35th m	10%	424371.00	509245.00	534707.00	
		36th m	10%	466808.00	560170.00	588179.00	
		37th m	10%	513489.00	616187.00	646996.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		38th m	10%	564838.00	677806.00	711696.00	
		39th m	10%	621322.00	745586.00	782865.00	
		40th m	10%	683454.00	820145.00	861152.00	
		Total Cost from 30m upto 40m		4619481	5543377	5820545	
		Avg Rate per metre		461948.00	554338.00	582055.00	
12.18	C	Soft Rock (12m dia well)					
		Unit = Running Meter					
		Taking output = 0.25 m					
		Depth in soft rock strata upto 3m					
		Rate of sinking @ 0.025 m/hour					
		a) Labour					
		Mate	day	1.06	582.53	617.48	L-12
		Sinker (skilled)	day	4.50	688.44	3097.98	L-15
		Sinking helper (semi-skilled)	day	20.00	582.53	11650.54	L-14
		Diver	day	1.75	794.35	1390.12	L-07
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	10.00	627.54	6275.40	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.75	288.03	1368.16	P&M-063
		Consumables in sinking @ 10 per cent of (b)				764.36	
		Add for dewatering @ 5 per cent, if required				420.40	
		c) Overhead charges @ 25% on (a+b)				6396.11	
		d) Contractor's profit @ 16% on (a+b+c)				5116.89	
		Cost for 0.25m = a+b+c+d				37097.43	
		Rate per metre = (a+b+c+d)/0.25				148389.71	
					say	148390.00	
12.18	D	Hard Rock (12m dia well)					
		Unit = Running Meter					
		Taking output = 0.25 m					
	(i)	Depth in hard rock strata upto 3 m					
		Rate of sinking @ 0.020 m/hour					
		a) Material					
		Gelatine 80 per cent	Kg	14.00	406.76	5694.65	M-104
		Electric detonator	each.	56.00	2.69	150.65	M-094/100
		b) Labour					
		Mate	day	1.44	582.53	838.84	L-12
		Driller	day	2.00	635.48	1270.97	L-06
		Blaster	day	0.25	635.48	158.87	L-03
		Mazdoor	day	28.00	529.57	14827.96	L-13
		Mazdoor (Skilled)	day	4.50	688.44	3097.98	L-15
		c) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	12.50	627.54	7844.25	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	4.00	288.03	1152.13	P&M-063
		Dewatering @ 5 per cent, if required.				449.82	
		Consumables in sinking @ 10 per cent of (c).				944.62	
		d) Overhead charges @ 25% on (a+b+c)				9107.69	
		e) Contractor's profit @ 16% on (a+b+c+d)				7286.15	
		Cost for 0.25m = a+b+c+d+e				52824.58	
		Rate per metre = (a+b+c+d+e)/0.25				211298.31	
					say	211298.00	
12.19	1200	Sinking of Twin D Type well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
		Unit = Running Meter					
		Taking output = 1 m					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Dimensions of well.					
		Overall length = 12 m					
		Overall width = 6 m					
	A	Sandy Soil					
	(i)	Depth from bed level upto 3.0 M					
		Rate of sinking @ 0.18 m/hour					
		a) Labour					
		Mate	day	0.20	582.53	116.51	L-12
		Sinker (skilled)	day	1.25	688.44	860.55	L-15
		Sinking helper (semi-skilled)	day	3.75	582.53	2184.48	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.50	627.54	3451.47	P&M-075
		Consumables in sinking @10 per cent of (b)				345.15	
		c) Overhead charges @ 25% on (a+b)				1739.54	
		d) Contractor's profit @ 16% on (a+b+c)				1391.63	
		Rate per metre = (a+b+c+d)				10089.32	
					say	<u>10089.00</u>	
12.19 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.17 m/hour					
		a) Labour					
		Mate	day	0.30	582.53	174.76	L-12
		Sinker	day	1.50	688.44	1032.66	L-15
		Sinking helper (semi-skilled)	day	4.00	582.53	2330.11	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.88	627.54	3689.94	P&M-075
		Consumables in sinking @10 per cent of (b)				368.99	
		c) Overhead charges @ 25% on (a+b)				1899.11	
		d) Contractor's profit @ 16% on (a+b+c)				1519.29	
		Rate per metre = (a+b+c+d)				11014.86	
					say	<u>11015.00</u>	
12.19 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		11th m	5%	11566.00			
		12th m	5%	12144.00			
		13th m	5%	12751.00			
		14th m	5%	13389.00			
		15th m	5%	14058.00			
		16th m	5%	14761.00			
		17th m	5%	15499.00			
		18th m	5%	16274.00			
		19th m	5%	17088.00			
		20th m	5%	17942.00			
		Total Cost from 10m upto 20m		145472.00			
		Avg Rate per metre		<u>14547.00</u>			
12.19 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.				Including 20% for Kentledge	
		21st m	7.5%	19288.00	23146.00		
		22nd m	7.5%	20735.00	24882.00		
		23rd m	7.5%	22290.00	26748.00		
		24th m	7.5%	23962.00	28754.00		
		25th m	7.5%	25759.00	30911.00		
		26th m	7.5%	27691.00	33229.00		
		27th m	7.5%	29768.00	35722.00		
		28th m	7.5%	32001.00	38401.00		

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		29th m	7.5%	34401.00	41281.00		
		30th m	7.5%	36981.00	44377.00		
		Total Cost from 20m upto 30m		272876.00	327451.00		
		Avg Rate per metre		<u>27288.00</u>	<u>32745.00</u>		
12.19 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.			Including 20% for Kentledge		
		31st m	10%	40679.00	48815.00		
		32nd	10%	44747.00	53696.00		
		33rd m	10%	49222.00	59066.00		
		34th m	10%	54144.00	64973.00		
		35th m	10%	59558.00	71470.00		
		36th m	10%	65514.00	78617.00		
		37th m	10%	72065.00	86478.00		
		38th m	10%	79272.00	95126.00		
		39th m	10%	87199.00	104639.00		
		40th m	10%	95919.00	115103.00		
		Total Cost from 30m upto 40m		648319.00	777983.00		
		Avg Rate per metre		<u>64832.00</u>	<u>77798.00</u>		
12.19	B	Clayey Soil (Twin D Type Well)					
		Unit = Running Meter					
		Taking output = 1 meter					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.16 m/hour					
	a)	Labour					
		Mate	day	0.26	582.53	151.46	L-12
		Sinker (skilled)	day	2.50	688.44	1721.10	L-15
		Sinking helper (semi-skilled)	day	4.00	582.53	2330.11	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.25	627.54	3922.13	P&M-075
		Consumables in sinking @ 10 per cent of (b)				392.21	
	c)	Overhead charges @ 25% on (a+b)				2129.25	
	d)	Contractor's profit @ 16% on (a+b+c)				1703.40	
		Rate per metre = (a+b+c+d)				12349.66	
					say	<u>12350.00</u>	
12.19 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.15 m/hour					
	a)	Labour					
		Mate	day	0.45	582.53	262.14	L-12
		Sinker	day	3.25	688.44	2237.43	L-15
		Sinking helper (semi-skilled)	day	6.00	582.53	3495.16	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.67	627.54	4185.69	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.50	288.03	1296.15	P&M-063
		Consumables in sinking @ 10 per cent of (b)				548.18	
	c)	Overhead charges @ 25% on (a+b)				3006.19	
	d)	Contractor's profit @ 16% on (a+b+c)				2404.95	
		Rate per metre = (a+b+c+d)				17435.90	
					say	<u>17436.00</u>	
12.19 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 per cent of cost, if required.			Including for dewatering @ 5% of cost, if required		

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		11th m	5%	18308.00	19223.00		
		12th m	5%	19223.00	20184.00		
		13th m	5%	20184.00	21193.00		
		14th m	5%	21193.00	22253.00		
		15th m	5%	22253.00	23366.00		
		16th m	5%	23366.00	24534.00		
		17th m	5%	24534.00	25761.00		
		18th m	5%	25761.00	27049.00		
		19th m	5%	27049.00	28401.00		
		20th m	5%	28401.00	29821.00		
		Total Cost from 10m upto 20m		230272.00	241785.00		
		Avg Rate per metre		<u>23027.00</u>	<u>24179.00</u>		
12.19 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 per cent of cost for dewatering on the cost, if required					
	c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 25% for Kentledge	Including 5% for dewatering, if required	
		31st m	7.5%	30531.00	38164.00	40072.00	
		32nd	7.5%	32821.00	41026.00	43077.00	
		33rd m	7.5%	35283.00	44104.00	46309.00	
		34th m	7.5%	37929.00	47411.00	49782.00	
		35th m	7.5%	40774.00	50968.00	53516.00	
		36th m	7.5%	43832.00	54790.00	57530.00	
		37th m	7.5%	47119.00	58899.00	61844.00	
		38th m	7.5%	50653.00	63316.00	66482.00	
		39th m	7.5%	54452.00	68065.00	71468.00	
		40th m	7.5%	58536.00	73170.00	76829.00	
		Total Cost from 30m upto 40m		431930.00	539913.00	566909.00	
		Avg Rate per metre		<u>43193.00</u>	<u>53991.00</u>	<u>56691.00</u>	
12.19 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 per cent of cost for dewatering, if required					
	c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
		31st m	10%	64390.00	77268.00	81131.00	
		32nd	10%	70829.00	84995.00	89245.00	
		33rd m	10%	77912.00	93494.00	98169.00	
		34th m	10%	85703.00	102844.00	107986.00	
		35th m	10%	94273.00	113128.00	118784.00	
		36th m	10%	103700.00	124440.00	130662.00	
		37th m	10%	114070.00	136884.00	143728.00	
		38th m	10%	125477.00	150572.00	158101.00	
		39th m	10%	138025.00	165630.00	173912.00	
		40th m	10%	151828.00	182194.00	191304.00	
		Total Cost from 30m upto 40m		1026207.00	1231449.00	1293022.00	
		Avg Rate per metre		<u>102621.00</u>	<u>123145.00</u>	<u>129302.00</u>	
12.19	C	Soft Rock (Twin D Type Well)					
		Unit = Running Meter					
		Taking output = 1 m					
		Depth in soft rock strata upto 3m					
		Rate of sinking @ 0.12 m/hour					
		a) Labour					
		Mate	day	0.86	582.53	500.97	L-12
		Sinker (skilled)	day	4.50	688.44	3097.98	L-15

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Sinking helper (semi-skilled)	day	15.00	582.53	8737.90	L-14
			Diver	day	1.50	794.35	1191.53	L-07
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.33	627.54	5227.41	P&M-075
			Air compressor with pneumatic breakers	hour	6.00	288.03	1728.20	P&M-063
			Consumables in sinking @ 10 per cent of (b)				695.56	
			Add for dewatering @ 5 per cent, if required				382.56	
			c) Overhead charges @ 25% on (a+b)				5390.53	
			d) Contractor's profit @ 16% on (a+b+c)				4312.42	
			Rate per metre = (a+b+c+d)				31265.08	
						say	<u>31265.00</u>	
12.19		D	Hard Rock (Twin D Type Well)					
			<i>Unit = Running Meter</i>					
			<i>Taking output = 1 m</i>					
			Depth in hard rock strata upto 3 m					
			Rate of sinking @ 0.10 m/hour					
			a) Material					
			Geletine 80 per cent	Kg	10.00	406.76	4067.61	M-104
			Electric detonators	each.	40.00	2.69	107.61	M-094/100
			b) Labour					
			Mate	day	1.34	582.53	780.59	L-12
			Driller	day	2.00	635.48	1270.97	L-06
			Blaster	day	0.25	635.48	158.87	L-03
			Mazdoor	day	25.00	529.57	13239.25	L-13
			Mazdoor (Skilled)	day	4.25	688.44	2925.87	L-15

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	10.00	627.54	6275.40	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	3.00	288.03	864.10	P&M-063
		Dewatering @ 5 per cent of cost of (b+c), if required.				1275.75	
		Consumables in sinking @ 10 per cent of (b).				841.53	
		d) Overhead charges @ 25% on (a+b+c)				7951.88	
		e) Contractor's profit @ 16% on (a+b+c+d)				6361.51	
		Rate per metre = (a+b+c+d+e)				46120.93	
					say	46121.00	
12.20	1200	Pneumatic sinking of wells with equipment of approved design, drawing and specifications worked by competent and trained personnel and comprising of compression and decompression chambers, reducers, two air locks separately for men and plant & materials, arrangement for supply of fresh air to working chambers, check valves, exhaust valves, shafts made from steel plates of riveted construction not less than 6 mm thick to withstand an air pressure of 0.50 MPa, controlled blasting of hard rock where required, staircases and 1 m wide landing platforms with railing, arrangement for compression and decompression, electric lighting of 50 V maximum, proper rooms for rest and medical examinations and compliance with safety precautions as per IS:4138, all as per clause 1207.6 of MoRTH Specifications.					
		Unit - 1 cum					
		Taking output = 5 cum					
		a) Material					
		M35 grade RCC corbel provided for supporting of equipment (Dimensions as per ground conditions). Rate may be adopted vide Item 12.8 (H)	Cum	8.00	8064.00	64512.00	Item 12.8 (H)
		HYSD bar reinforcement in corbel	tonne	0.48	52915.23	25399.31	M-082
		Blasting material					
		Gelatine 80 per cent	Kg	1.50	406.76	610.14	M-104
		Electric detonators	each	6.00	2.69	16.14	M-094/100
		b) Labour					
		Medical Officer	day	0.50	1165.05	582.53	L-16
		Para medical personnel	day	1.00	900.27	900.27	L-19
		Mate	day	1.86	582.53	1083.50	L-12
		Driller	day	1.00	635.48	635.48	L-06
		Blaster	day	0.50	635.48	317.74	L-03
		Mazdoor (for cutting, blasting, cleaning, removal of Material etc.)	day	30.00	529.57	15887.10	L-13
		Mazdoor (Skilled) (for fixation and removal of adopter for air lock, carrying out mechanical and electrical operations and repairs and other skilled jobs.)	day	10.00	688.44	6884.41	L-15
		Diver	day	4.00	794.35	3177.42	L-07
		c) Machinery					
		(i) Induction, deinduction and erection of plant and equipment including all components and accessories for pneumatic method of well sinking.	hour	6.00	3694.23	22165.36	P&M-082
		Induction and deinduction	L.S			100000.00	
		Erection at site and commissioning	L.S			150000.00	
		Usage of plant and equipment for pneumatic method of well sinking	hour	6.00	4048.03	24288.19	P&M-038
		Air compressor 250 cfm, 2 nos.	hour	2 x 6	887.56	10650.71	P&M-001
		Hire and running charges of crane of 15 tonne capacity	hour	6.00	661.70	3970.19	P&M-072
		Motorised barge of 20 tonne capacity	hour	6.00	357.99	2147.94	P&M-066
		Boat to carry atleast 20 persons	hour	6.00	357.99	2147.94	P&M-066
		Electric generating set 33 KVA	hour	6.00	1075.56	6453.34	P&M-079

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Tipper 10 tonne capacity	hour	6.00	1006.18	6037.10	P&M-048
		d) Overhead charges @ 25% on (a+b+c)				95838.70	
		e) Contractor's profit @ 16% on (a+b+c+d)				76670.96	
		Cost for 5 cum = a+b+c+d+e (see notes below)					
		Rate per cum = (a+b+c+d+e)/5					
	Note	1.The cost of induction, deinduction and erection of equipment shall be divided by the total quantity of pneumatic sinking for all the wells of a particular bridge to arrive at the per cum rate on account of this item.					
		2.Cost of pneumatic sinking per cum of individual wells will be added to the cost indicated at (1) above to arrive at the final rate of pneumatic sinking per cum.					
		3.The cost of induction and deinduction will depend upon the distance involved for shifting of equipment which may be assessed in individual cases as per actual ground conditions at the time of making of cost estimates.					
		4.In case pneumatic sinking is involved on a dry bed, the provision of barge and boat may be omitted.					
		5.The necessity and dimensions of the corbel will be as per actual ground conditions.					
		6.Small equipments like welding sets, pumps, vibrators, pneumatic tools, portable lamps, fire extinguishers, hose pipes etc., have not been included as the same are covered as items of minor T&P under overhead charges.					
		7.Depth of sinking shall be restricted to 30 m.					
12.21	1207	Sand Filling in Wells complete as per Drawing and Technical Specifications.					
		Unit = 1 cum					
		Taking output = 1 cum					
		a) Material					
		Sand (assuming 20 per cent voids)	cum	1.20	7753.27	9303.93	M-006
		b) Labour					
		Mate	day	0.01	582.53	5.83	L-12
		Mazdoor	day	0.30	529.57	158.87	L-13
		c) Overhead charges @ 25% on (a+b)				2367.16	
		d) Contractor's profit @ 16% on (a+b+c)				1893.72	
		Rate per cum (a+b+c+d)				13729.50	
					say	13730.00	
12.22	1200 & 1900	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.					
		Unit = 1 MT					
		Taking output = 1 MT					
		a) Material					
		i) Structural steel including 5 per cent wastage	tonne	1.05	60667.13	63700.49	M-179
		b) Labour					
		Mate	day	1.24	582.53	722.33	L-12
		Fitter	day	6.00	635.48	3812.90	L-08
		Blacksmith	day	5.00	582.53	2912.63	L-01
		Welder	day	5.00	635.48	3177.42	L-02
		Mazdoor	day	10.00	529.57	5295.70	L-13
		Electrodes, cutting gas and other consumables @ 5 per cent on cost a (a) above.				3185.02	
		c) Overhead charges @ 25% on (a+b)				20701.62	
		d) Contractor's profit @ 16% on (a+b+c)				16561.30	
		Rate for per MT (a+b+c+d)				120069.42	
					say	120069.00	
12.23	1100 & 1700	Bored cast-in-situ M35 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.					
		Pile diameter-750 mm					
		Unit = meter					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Taking output = 15 m					
		a) Materials					
		PCC Grade M35	cum	6.62	10323.00	68338.26	Item 12.11 (C) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11(C) (IV)					
		Concrete to be cast with a tremie pipe 200mm dia.					
		b) Machinery(for boring and construction)					
		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	5303.11	31818.68	P&M-036
		Hire and running charges of light crane for lowering reinforcement cage	hour	0.50	788.00	394.00	P&M-013
		Hire and running charges of Bentonite pump	hour	6.00	Rate included in piling rig		
		Loader 1 cum bucket capacity.	hour	0.30	930.98	279.30	P&M-017
		Tipper 5.5 cum capacity for disposal of muck from pile bore hole	hour	0.30	1006.18	301.85	P&M-048
		Bentonite	kg	300.00	233.04	69911.96	M-071
		c) Labour					
		Mate/Supervisor	day	0.14	582.53	81.55	L-12
		Mazdoor	day	3.50	529.57	1853.49	L-13
		d) Overhead charges @ 25% on (b+c)				26160.21	
		e) Contractor's profit @ 16% on (b+c+d)				20928.17	
		Cost for 15 m = a+b+c+d+e				220067.48	
		Rate per metre (a+b+c+d+e)/15				14671.17	
					say	14671.00	
12.24	1100,1600 & 1700	Bored cast-in-situ M35 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.					
		Pile diameter-1000 mm					
		Unit = meter					
		Taking output = 10 m					
		a) Materials					
		PCC Grade M35	cum	7.85	10323.00	81035.55	Item 12.11 (C) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11(C) (IV)					
		Concrete to be cast with a tremie pipe 200mm dia.					
		b) Machinery(for boring and construction)					
		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	5303.11	31818.68	P&M-036
		Hire and running charges of light crane for lowering reinforcement cage	hour	0.50	788.00	394.00	P&M-013
		Hire and running charges of Bentonite pump	hour	6.00	Rate included in piling rig		
		Loader 1 cum bucket capacity.	hour	0.40	930.98	372.39	P&M-017
		Tipper 5.5 cum capacity for disposal of muck from pile bore hole	hour	0.40	1006.18	402.47	P&M-048
		Bentonite	kg	350.00	233.04	81563.96	M-071
		c) Labour					
		Mate/Supervisor	day	0.16	582.53	93.20	L-12
		Mazdoor	day	4.00	529.57	2118.28	L-13
		d) Overhead charges @ 25% on (b+c)				29190.75	
		e) Contractor's profit @ 16% on (b+c+d)				23352.60	
		Cost for 10 m = a+b+c+d+e				250341.88	
		Rate per metre (a+b+c+d+e)/10				25034.19	
					say	25034.00	
12.25	1100 & 1700	Bored cast-in-situ M35 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.					
		Pile diameter-1200 mm					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Unit = meter					
		Taking output = 9 m					
		a) Materials					
		PCC Grade M35	cum	10.17	11656.00	118541.52	Item 12.11 (C) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11(C) (IV)					
		Concrete to be cast with a tremie pipe 200mm dia.					
		b) Machinery(for boring and construction)					
		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	5303.11	31818.68	P&M-036
		Hire and running charges of light crane for lowering reinforcement cage	hour	0.50	788.00	394.00	P&M-013
		Hire and running charges of Bentonite pump	hour	6.00	Rate included in piling rig		
		Loader 1 cum bucket capacity.	hour	0.50	930.98	465.49	P&M-017
		Tipper 5.5 cum capacity for disposal of muck from pile bore hole	hour	0.50	1006.18	503.09	P&M-048
		Bentonite	kg	385.00	233.04	89720.35	M-071
		c) Labour					
		Mate/Supervisor	day	0.18	582.53	104.85	L-12
		Mazdoor	day	4.50	529.57	2383.06	L-13
		d) Overhead charges @ 25% on (b+c)				31347.38	
		e) Contractor's profit @ 16% on (b+c+d)				25077.91	
		Cost for 9 m = a+b+c+d+e				300356.34	
		Rate per metre (a+b+c+d+e)/9				33372.93	
					say	33373.00	
12.26	1100 & 1700	Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and & Technical Specification					
		Pile diameter - 750 mm					
		Unit = Running meter					
		Taking output = 40 metre					
		a) Materials					
		PCC Grade M35	cum	17.66	11656.00	205844.96	Item 12.11 (C) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11(C) (IV)					
		b) Materials Pile shoes					
		i) C.I. shoes for the pile	Kg	160.00	64.97	10394.99	M-080
		ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.00	100.88	7061.81	M-124
		iii) Steel helmet and cushion block on top of casing head during driving	Kg	50.00	235.39	11769.69	M-173

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Machinery					
		Hire and running charges of piling rig Including double acting pile driving hammer complete with power unit and accessories..	hour	6.00	187.94	1127.67	P&M-085
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.50	510.45	255.23	P&M-070
		d) Labour					
		Mate/Supervisor	day	0.12	582.53	69.90	L-12
		Mazdoor	day	3.00	529.57	1588.71	L-13
		e) Overhead charges @ 25% on (b+c+d)				8067.00	
		f) Contractor's profit @ 16% on (b+c+d+e)				6453.60	
		Cost for 40 m = a+b+c+d+e				252633.56	
		Rate per metre (a+b+c+d+e)/40				6315.84	
					say	6316.00	
		Note					
		1.The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
		2.In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 per cent of cost of concrete may be provided to cover its usage.					
12.27	1100 & 1700	Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and & Technical Specification					
		Pile diameter - 1000 mm					
		Unit = Running meter					
		Taking output = 30 metre					
		a) Materials					
		PCC Grade M35	cum	23.55	11656.00	274498.80	Item 12.11 (C) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11(C) (IV)					
		b) Materials Pile shoes					
		i) C.I. shoes for the pile	Kg	160.00	64.97	10394.99	M-080
		ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.00	100.88	7061.81	M-124
		iii) Steel helmet and cushion block on top of casing head during driving	Kg	50.00	235.39	11769.69	M-173
		c) Machinery					
		Hire and running charges of piling rig Including double acting pile driving hammer complete with power unit and accessories.	hour	6.00	187.94	1127.67	P&M-085
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.50	510.45	255.23	P&M-070
		Hire and running charges for light crane for lowering reinforcement cage.	hour	0.50	788.00	394.00	P&M-013
		d) Labour					
		Mate/Supervisor	day	0.16	582.53	93.20	L-12
		Mazdoor	day	4.00	529.57	2118.28	L-13
		e) Overhead charges @ 25% on (b+c+d)				8303.72	
		f) Contractor's profit @ 16% on (b+c+d+e)				6642.97	
		Cost for 30 m = a+b+c+d+e				322660.37	
		Rate per metre (a+b+c+d+e)/30				10755.35	
					say	10755.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Note					
		1.The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
		2.In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 per cent of cost of concrete may be provided to cover its usage.					
12.28	1100 & 1700	Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and & Technical Specification					
		Pile diameter - 1200 mm					
		Unit = Running meter					
		Taking output = 20 metre					
		a) Materials					
		PCC Grade M35	cum	22.61	11656.00	263542.16	Item 12.11 (C) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11(C) (IV)					
		b) Materials Pile shoes					
		i) C.I. shoes for the pile	Kg	160.00	64.97	10394.99	M-080
		ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.00	100.88	7061.81	M-124
		iii) Steel helmet on top of casing head during driving	Kg	50.00	235.39	11769.69	M-173
		c) Machinery					
		Hire and running charges of piling rig Including double acting pile driving hammer complete with power unit and accessories.	hour	6.00	187.94	1127.67	P&M-085
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.50	510.45	255.23	P&M-070
		d) Labour					
		Mate/Supervisor	day	0.18	582.53	104.85	L-12
		Mazdoor	day	4.50	529.57	2383.06	L-13
		e) Overhead charges @ 25% on (b+c+d)				8274.33	
		f) Contractor's profit @ 16% on (b+c+d+e)				6619.46	
		Cost for 20 m = a+b+c+d+e				311533.26	
		Rate per metre (a+b+c+d+e)/20				15576.66	
					say	15577.00	
		Note					
		1.The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
		2.In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 per cent of cost of concrete may be provided to cover its usage.					
12.29	1100 & 1700	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification					
		Pile Diameter = 500 mm					
		Unit = Running Meter					
		Taking output = 60 m					
		a) Materials					
		RCC Grade M35	cum	11.78	10743.00	126552.54	Item 12.11 (F) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11(F) (IV)					
		b) Material Pile shoes					
		a) C.I Shoes	Kg	240.00	64.97	15592.49	M-080
		b) M.S. shoes	Kg	105.00	92.48	9709.99	M-125
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.00	235.39	7061.81	M-173
		c) Machinery					
		Crane 20 t capacity	hour	6.00	786.25	4717.51	P&M-073

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	1050.88	6305.27	P&M-092
		d) Labour					
		Mate/Supervisor	day	0.12	582.53	69.90	L-12
		Mazdoor	day	3.00	529.57	1588.71	L-13
		Add 1 per cent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.				1715.98	
		e) Overhead charges @ 25% on (b+c+d)				11690.42	
		f) Contractor's profit @ 16% on (b+c+d+e)				9352.34	
		Cost for 60 m = a+b+c+d+e+f				194356.97	
		Rate per metre (a+b+c+d+e+f)/60				3239.28	
					say	3239.00	
		Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
12.30	1100 & 1700	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification					
		Pile Diameter = 750 mm					
		Unit = Running Meter					
		Taking output = 50 m					
		a) Materials					
		RCC Grade M35	cum	22.08	10743.00	237205.44	Item 12.11 (F) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11(F) (IV)					
		b) Material Pile shoes					
		a) C.I. shoes	Kg	160.00	64.97	10394.99	M-080
		b) M.S. shoes	Kg	70.00	92.48	6473.33	M-125
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	40.00	235.39	9415.75	M-173
		c) Machinery					
		Crane 40 T capacity	hour	6.00	911.92	5471.52	P&M-074
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	1050.88	6305.27	P&M-092
		d) Labour					
		Mate/Supervisor	day	0.16	582.53	93.20	L-12
		Mazdoor	day	4.00	529.57	2118.28	L-13
		Add 1 per cent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.				2774.78	
		e) Overhead charges @ 25% on (b+c+d)				10761.78	
		f) Contractor's profit @ 16% on (b+c+d+e)				8609.42	
		Cost for 50 m = a+b+c+d+e+f				299623.77	
		Rate per metre (a+b+c+d+e+f)/50				5992.48	
					say	5992.00	
		Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
12.31	1100 & 1700	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification					
		Pile Diameter = 1000 mm					
		Unit = Running Meter					
		Taking output = 40 m					
		a) Materials					
		RCC Grade M35	cum	31.40	10743.00	337330.20	Item 12.11 (F) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11(F) (IV)					
		b) Material Pile shoes					
		a) C.I. shoes for the pile	Kg	160.00	64.97	10394.99	M-080
		b) M.S. shoes @ 35 Kg per pile of 15 m	Kg	70.00	92.48	6473.33	M-125

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	50.00	235.39	11769.69	M-173
		c) Machinery					
		Crane 50 t capacity.	hour	6.00	1773.00	10638.00	P&M-011
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	1050.88	6305.27	P&M-092
		d) Labour					
		Mate/Supervisor	day	0.20	582.53	116.51	L-12
		Mazdoor	day	5.00	529.57	2647.85	L-13
		Add 1 per cent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.				3856.76	
		e) Overhead charges @ 25% on (b+c+d)				13050.60	
		f) Contractor's profit @ 16% on (b+c+d+e)				10440.48	
		Cost for 40 m = a+b+c+d+e+f				413023.67	
		Rate per metre (a+b+c+d+e+f)/40				10325.59	
					say	10326.00	
		Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
12.32	1100&1700	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification					
		Size of pile - 300 mm x 300 mm					
		Unit = Running Meter					
		Taking output = 60 m					
		a) Materials					
		RCC Grade M-35					
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11(F) (IV)	cum	5.40	10743.00	58012.20	Item 12.11 (F) iv
		b) Material Pile shoes					
		a) C I shoes	kg	240.00	64.97	15592.49	M-080
		b) M. S shoes	kg	105.00	92.48	9709.99	M-125
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.00	235.39	7061.81	M-173
		c) Machinery					
		Crane 10 tonne capacity	hour	6.00	598.31	3589.85	P&M-071
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	1050.88	6305.27	P&M-092
		d) Labour					
		Mate/Supervisor	day	0.12	582.53	69.90	L-12
		Mazdoor	day	3.00	529.57	1588.71	L-13
		Add 1 per cent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.				1019.30	
		e) Overhead charges @ 25% on (b+c+d)				11234.33	
		f) Contractor's profit @ 16% on (b+c+d+e)				8987.47	
		Cost for 60 m = a+b+c+d+e+f				123171.33	
		Rate per metre (a+b+c+d+e+f)/60				2052.86	
					say	2053.00	
		Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
12.33	1100 & 1700	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification					
		Size of pile - 500 mm x 500 mm					
		Unit = Running Meter					
		Taking output = 50 m					
		a) Materials					
		RCC Grade M-35					
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11(F) (IV)	cum	12.50	10743.00	134287.50	Item 12.11 (F) iv
		b) Material Pile shoes					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) C I shoes	kg	160.00	64.97	10394.99	M-080
		b) M. S shoes	kg	70.00	92.48	6473.33	M-125
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.00	235.39	7061.81	M-173
		c) Machinery					
		Crane 20 tonne capacity	hour	6.00	786.25	4717.51	P&M-073
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	1050.88	6305.27	P&M-092
		d) Labour					
		Mate/Supervisor	day	0.16	582.53	93.20	L-12
		Mazdoor	day	4.00	529.57	2118.28	L-13
		Add 1 per cent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.				1714.52	
		e) Overhead charges @ 25% on (b+c+d)				9719.73	
		f) Contractor's profit @ 16% on (b+c+d+e)				7775.78	
		Cost for 50 m = a+b+c+d+e+f				190661.94	
		Rate per metre (a+b+c+d+e+f)/50				3813.24	
					say	3813.00	
		Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
12.34	1100 & 1700	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification					
		Size of pile - 750 mm x 750 mm					
		Unit = Running Meter					
		Taking output = 40 m					
		a) Materials					
		RCC Grade M-35					
		Rate for concrete may be adopted same as for bottom plug vide item no. 13.11(F) (IV)	cum	22.50	10743.00	241717.50	Item 12.11 (F) iv
		b) Material					
		Pile shoes					
		a) C I shoes	kg	160.00	64.97	10394.99	M-080
		b) M. S shoes	kg	70.00	92.48	6473.33	M-125
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.00	235.39	7061.81	M-173
		c) Machinery					
		Crane 20 tonne capacity	hour	6.00	786.25	4717.51	P&M-073
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	1050.88	6305.27	P&M-092
		d) Labour					
		Mate/Supervisor	day	0.18	582.53	104.85	L-12
		Mazdoor	day	4.50	529.57	2383.06	L-13
		Add 1 per cent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.				2791.58	
		e) Overhead charges @ 25% on (b+c+d)				10058.11	
		f) Contractor's profit @ 16% on (b+c+d+e)				8046.48	
		Cost for 40 m = a+b+c+d+e+f				300054.51	
		Rate per metre (a+b+c+d+e+f)/40				7501.36	
					say	7501.00	
		Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
12.35	1100, 1900	Driven Vertical Steel Piles complete as per Drawing and & Technical Specification					
		Section of the pile - H Section steel column 400 x 250 mm (ISHB Series)					
		Unit = Running Meter					
		Taking output = 70 m					
		a) Materials					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Structural steel including 5 per cent wastage @ 82.20 kg/m	tonnes	6.04	60667.13	366429.46	M-179
		b) Machinery					
		Crane 10 T capacity	hour	6.00	598.31	3589.85	P&M-071
		Vibrating Pile driving hammer complete with power unit and other accessories.	hour	6.00	1050.88	6305.27	P&M-092
		c) Labour					
		Mate/Supervisor	day	0.12	582.53	69.90	L-12
		Mazdoor	day	3.00	529.57	1588.71	L-13
		Add 0.5 per cent of (a+b+c) for providing steel helmet on top of pile head during driving, stacking of piles at site, providing anti-corrosion treatment and other imponderables during installation.				1889.92	
		d) Overhead charges @ 25% on (a+b+c)				94968.28	
		e) Contractor's profit @ 16% on (a+b+c+d)				75974.62	
		Cost for 70 m = a+b+c+d+e				550816.01	
		Rate per metre (a+b+c+d+e)/70				7868.80	
					say	<u>7869.00</u>	
12.36	1100 & 1900	Driven Vertical Steel Piles complete as per Drawing and & Technical Specification					
		Section of the pile - H Section steel column 450 x 250 mm (ISHB Series)					
		Unit = Running Meter					
		Taking output = 60 m					
		a) Materials					
		Structural steel including 5 per cent wastage @ 92.50 kg/m	tonnes	5.83	60667.13	353689.37	M-179
		b) Machinery					
		Crane 10 T capacity	hour	6.00	598.31	3589.85	P&M-071
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	1050.88	6305.27	P&M-092
		c) Labour					
		Mate/Supervisor	day	0.14	582.53	81.55	L-12
		Mazdoor	day	3.50	529.57	1853.49	L-13
		Add 0.5 per cent of (a+b+c) for providing steel helmet and cushion block on top of pile head during driving, stacking of piles at site, providing anti-corrosive treatment and other imponderables during installation.				1827.60	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 25% on (a+b+c)				91836.78	
		e) Contractor's profit @ 16% on (a+b+c+d)				73469.43	
		Cost for 60 m = a+b+c+d+e				532653.34	
		Rate per metre (a+b+c+d+e)/60				8877.56	
					say	<u>8878.00</u>	
12.37	1100	Pile Load Test on single Vertical Pile in accordance with IS:2911(Part-IV)					
		Unit = 1 MT					
		Taking output = 1 MT					
		a) Initial and routine load test	tonne	1.00	300.00		
		b) Lateral load test	tonne	1.00	5000.00		
		Note 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.					
12.38	1100, 1500 & 1700	Cement Concrete for Reinforced Concrete in Pile Cap complete as per Drawing and Technical Specification					
	A	RCC Grade M20					
		Unit = cum					
		Taking output = 15 cum					
	(i)	Using Concrete Mixer					
		a) Material					
		Cement	tonne	5.12	7169.28	36706.71	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
		10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
		b) Labour					
		Mate	day	0.90	582.53	524.27	L-12
		Mason	day	1.50	529.57	794.35	L-10
		Mazdoor for concreting	day	20.00	529.57	10591.40	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	529.57	529.57	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator (capacity 33 KVA)	hour	6.00	1075.56	6453.34	P&M-079
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				5432.65	
		d) Overhead charges @ 25% on (a+b+c)				35312.20	
		e) Contractor's profit @ 16% on (a+b+c+d)				28249.76	
		Cost for 15 cum = a+b+c+d+e				204810.74	
		Rate per metre (a+b+c+d+e)/15				13654.05	
					say	<u>13654.00</u>	
12.38A	(ii)	Using Batching Plant, Transit Mixer and Concrete Pump					
		a) Material					
		Cement	tonne	5.12	7169.28	36706.71	M-081
		Coarse sand	cum	6.75	1297.45	8757.76	M-004
		20 mm Aggregate	cum	8.10	2609.72	21138.74	M-053
		10 mm Aggregate	cum	5.40	2372.05	12809.07	M-051
		b) Labour					
		Mate	day	0.16	582.53	93.20	L-12
		Mason	day	0.38	529.57	201.24	L-10
		Mazdoor for concreting	day	2.50	529.57	1323.92	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	529.57	529.57	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	0.75	2195.60	1646.70	P&M-002
		Generator 100 KVA	hour	0.75	1253.49	940.12	P&M-080
		Loader (capacity 1 cum)	hour	0.75	930.98	698.24	P&M-017
		Transit Mixer (capacity 4.0 cu.m)					
		Lead upto 1 Km	hour	2.00	165.23	330.45	P&M-049

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	38.45	14417.54	Lead =10 km & P&M-050
		Concrete Pump	hour	0.75	409.89	307.42	P&M-007
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				3996.03	
		d) Overhead charges @ 25% on (a+b+c)				25974.18	
		e) Contractor's profit @ 16% on (a+b+c+d)				20779.34	
		Cost for 15 cum = a+b+c+d+e				150650.22	
		Rate per metre (a+b+c+d+e)/15				10043.35	
					say	10043.00	
	Note	The value of a, b and c may be taken as applicable i.e. either using concrete mixer or batching plant.					
12.38	B	RCC Grade M25					
		Unit = cum					
		Taking output = 15 cum					
	(i)	Using Concrete Mixer					
		a) Material					
		Cement	tonne	5.99	7169.28	42943.99	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
		10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
		b) Labour					
		Mate	day	0.90	582.53	524.27	L-12
		Mason	day	1.50	529.57	794.35	L-10
		Mazdoor for concreting	day	20.00	529.57	10591.40	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	529.57	529.57	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator (capacity 33 KVA)	hour	6.00	1075.56	6453.34	P&M-079
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				5682.14	
		d) Overhead charges @ 25% on (a+b+c)				36933.89	
		e) Contractor's profit @ 16% on (a+b+c+d)				29547.11	
		Cost for 15 cum = a+b+c+d+e				214216.55	
		Rate per metre (a+b+c+d+e)/15				14281.10	
					say	14281.00	
12.38B	(ii)	Using Batching Plant, Transit Mixer and Concrete Pump					
		a) Material					
		Cement	tonne	5.99	7169.28	42943.99	M-081
		Coarse sand	cum	6.75	1297.45	8757.76	M-004
		20 mm Aggregate	cum	8.10	2609.72	21138.74	M-053
		10 mm Aggregate	cum	5.40	2372.05	12809.07	M-051
		b) Labour					
		Mate	day	0.16	582.53	93.20	L-12
		Mason	day	0.38	529.57	201.24	L-10
		Mazdoor for concreting	day	2.50	529.57	1323.92	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	529.57	529.57	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	0.75	2195.60	1646.70	P&M-002
		Generator 125 KVA	hour	0.75	709.62	532.22	P&M-018
		Loader (capacity 1 cum)	hour	0.75	930.98	698.24	P&M-017
		Transit Mixer (capacity 4.0 cu.m)					
		Lead upto 1 Km	hour	2.00	165.23	330.45	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	38.45	14417.54	Lead =10 km & P&M-050
		Concrete Pump	hour	0.75	409.89	307.42	P&M-007

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				4229.20	
		d) Overhead charges @ 25% on (a+b+c)				27489.81	
		e) Contractor's profit @ 16% on (a+b+c+d)				21991.85	
		Cost for 15 cum = a+b+c+d+e				159440.91	
		Rate per metre (a+b+c+d+e)/15				10629.39	
					say	<u>10629.00</u>	
	Note	The value of a, b and c may be taken as applicable i.e. either using concrete mixer or batching plant.					
12.38	C	RCC Grade M30					
		Unit = cum					
		Taking output = 15 cum					
	(i)	Using Concrete Mixer					
		a) Material					
		Cement	tonne	6.10	7169.28	43732.61	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
		10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
		b) Labour					
		Mate	day	0.90	582.53	524.27	L-12
		Mason	day	1.50	529.57	794.35	L-10
		Mazdoor for concreting	day	20.00	529.57	10591.40	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	529.57	529.57	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator (capacity 33 KVA)	hour	6.00	1075.56	6453.34	P&M-079
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				5713.68	
		d) Overhead charges @ 25% on (a+b+c)				37138.93	
		e) Contractor's profit @ 16% on (a+b+c+d)				29711.14	
		Cost for 15 cum = a+b+c+d+e				215405.79	
		Rate per metre (a+b+c+d+e)/15				14360.39	
					say	<u>14360.00</u>	
12.38C	(ii)	Using Batching Plant, Transit Mixer and Concrete Pump					
		a) Material					
		Cement	tonne	6.10	7169.28	43732.61	M-081
		Coarse sand	cum	6.75	1297.45	8757.76	M-004
		20 mm Aggregate	cum	8.10	2609.72	21138.74	M-053
		10 mm Aggregate	cum	5.40	2372.05	12809.07	M-051
		b) Labour					
		Mate	day	0.16	582.53	93.20	L-12
		Mason	day	0.38	529.57	201.24	L-10
		Mazdoor for concreting	day	2.50	529.57	1323.92	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	529.57	529.57	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	0.75	2195.60	1646.70	P&M-002
		Generator 100 KVA	hour	0.75	1253.49	940.12	P&M-080
		Loader (capacity 1 cum)	hour	0.75	930.98	698.24	P&M-017
		Transit Mixer (capacity 4.0 cu.m)					
		Lead upto 1 Km	hour	2.00	165.23	330.45	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	38.45	14417.54	Lead =10 km & P&M-050
		Concrete Pump	hour	0.75	409.89	307.42	P&M-007
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				4277.06	
		d) Overhead charges @ 25% on (a+b+c)				27800.91	
		e) Contractor's profit @ 16% on (a+b+c+d)				22240.73	
		Cost for 15 cum = a+b+c+d+e				161245.27	
		Rate per metre (a+b+c+d+e)/15				10749.68	
					say	10750.00	
	Note	The value of a, b and c may be taken as applicable i.e. either using concrete mixer or batching plant.					
12.38	D	RCC Grade M35					
		Unit = cum					
		Taking output = 15 cum					
	(i)	Using Concrete Mixer					
		a) Material					
		Cement	tonne	6.33	7169.28	45381.54	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
		10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
		b) Labour					
		Mate	day	0.90	582.53	524.27	L-12
		Mason	day	1.50	529.57	794.35	L-10
		Mazdoor	day	20.00	529.57	10591.40	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	529.57	529.57	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator (capacity 33 KVA)	hour	6.00	1075.56	6453.34	P&M-079
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				5779.64	
		d) Overhead charges @ 25% on (a+b+c)				37567.65	
		e) Contractor's profit @ 16% on (a+b+c+d)				30054.12	
		Cost for 15 cum = a+b+c+d+e				217892.38	
		Rate per metre (a+b+c+d+e)/15				14526.16	
					say	14526.00	
12.38D	(ii)	Using Batching Plant, Transit Mixer and Concrete Pump					
		a) Material					
		Cement	tonne	6.33	7169.28	45381.54	M-081
		Coarse sand	cum	6.75	1297.45	8757.76	M-004
		20 mm Aggregate	cum	8.10	2609.72	21138.74	M-053
		10 mm Aggregate	cum	5.40	2372.05	12809.07	M-051
		b) Labour					
		Mate	day	0.16	582.53	93.20	L-12
		Mason	day	0.38	529.57	201.24	L-10
		Mazdoor for concreting	day	2.50	529.57	1323.92	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	529.57	529.57	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	0.75	2195.60	1646.70	P&M-002
		Generator 125 KVA	hour	0.75	709.62	532.22	P&M-018
		Loader (capacity 1 cum)	hour	0.75	930.98	698.24	P&M-017

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Transit Mixer (capacity 4.0 cu.m)					
		Lead upto 1 Km	hour	2.00	165.23	330.45	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	38.45	14417.54	Lead =10 km & P&M-050
		Concrete Pump	hour	0.75	409.89	307.42	P&M-007
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				4326.70	
		d) Overhead charges @ 25% on (a+b+c)				28123.58	
		e) Contractor's profit @ 16% on (a+b+c+d)				22498.86	
		Cost for 15 cum = a+b+c+d+e				163116.75	
		Rate per metre (a+b+c+d+e)/15				10874.45	
					say	<u>10874.00</u>	
12.39	1100&1700	Levelling Course for Pile cap					
		Providing and laying of PCC M15 levelling course 100mm thick below the pile cap.					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Cement	tonne	4.13	7169.28	29609.13	M-081
		Coarse sand	cum	6.75	6977.61	47098.89	M-005
		40 mm aggregate	cum	8.10	1919.16	15545.21	M-055
		20 mm Aggregate	cum	4.05	2372.47	9608.52	M-053
		10 mm Aggregate	cum	1.35	2156.41	2911.15	M-051
		b) Labour					
		Mate	day	0.86	582.53	500.97	L-12
		Mason	day	1.50	529.57	794.35	L-10
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
		Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
		d) Overhead charges @ 25% on (a+b+c)				31342.23	
		e) Contractor's profit @ 16% on (a+b+c+d)				25073.78	
		Cost for 15 cum = a+b+c+d+e				181784.93	
		Rate per metre (a+b+c+d+e)/15				12119.00	
					say	<u>12119.00</u>	
12.40	1600	Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications.					
		Unit = 1 MT					
		Taking output = 1 MT					
		a) Material					
		HYSD bars including 5 per cent overlaps and wastage	tonne	1.05	52915.23	55560.99	M-082
		Binding wire	Kg	6.00	87.43	524.59	M-072
		b) Labour for cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.40	582.53	233.01	L-12
		Blacksmith	day	2.00	635.48	1270.97	L-02
		Mazdoor	day	6.00	529.57	3177.42	L-13
						15191.75	
						12153.40	
						88112.12	
					say	<u>88112.00</u>	
12.41	1600	Supplying, fitting and placing un-coated Mild steel reinforcement complete in foundation as per drawing and technical specification					
		Unit = 1 MT					
		Taking output = 1 MT					
		a) Material					
		MS bars including 5 per cent overlaps and wastage	tonne	1.05	52915.23	55560.99	M-126
		Binding wire	Kg	6.00	87.43	524.59	M-072

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.43	582.53	250.49	L-12
		Blacksmith	day	2.25	635.48	1429.84	L-02
		Mazdoor	day	6.50	529.57	3442.20	L-13
		c) Overhead charges @ 25% on (a+b)				15302.03	
		d) Contractor's profit @ 16% on (a+b+c)				12241.62	
		Rate for per MT (a+b+c+d)				88751.76	
					say	<u>88752.00</u>	

CHAPTER-13							
SUB-STRUCTURE							
Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.1	1300 & 2200	Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and Technical Specifications					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Bricks 1st class	each	500.00	19.66	9832.35	M-079
		Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	0.24	11830.00	2839.20	Item 12.6 (A)
		b) Labour					
		Mate	day	0.06	582.53	34.95	L-12
		Mason	day	0.80	635.48	508.39	L-11
		Mazdoor	day	0.80	529.57	423.66	L-13
		Add for scaffolding @ 5 per cent of cost of material and labour				681.93	
		c) Overhead charges @ 25% on (a+b)				3580.12	
		d) Contractor's profit @ 16% on (a+b+c)				2864.09	
		Rate per cum (a+b+c+d)				20764.68	
					say	20765.00	
13.2	1300 & 2200	Pointing with cement mortar (1:3) on brick work in substructure as per Technical Specifications					
		Unit = 10 sqm					
		Taking output = 10 sqm					
		a) Material					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.03	11830.00	354.90	Item 12.6 (A)
		b) Labour					
		Mate	day	0.04	582.53	23.30	L-12
		Mason	day	0.50	635.48	317.74	L-11
		Mazdoor	day	0.50	529.57	264.78	L-13
		c) Overhead charges @ 25% on (a+b)				240.18	
		d) Contractor's profit @ 16% on (a+b+c)				192.15	
		Rate per 10 sqm (a+b+c+d)/10				139.31	
					say	139.30	
	Note	Scaffolding is already included in item 13.1					
13.3	1300 & 2200	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical Specifications					
		Unit = 10 sqm					
		Taking output = 10 sqm					
		a) Material					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.144	11483.00	1653.55	Item 12.6 (A)
		b) Labour					
		Mate	day	0.04	582.53	23.30	L-12
		Mason	day	0.50	635.48	317.74	L-11
		Mazdoor	day	0.50	529.57	264.78	L-13
		c) Overhead charges @ 25% on (a+b)				564.84	
		d) Contractor's profit @ 16% on (a+b+c)				451.88	
		Rate per 10 sqm (a+b+c+d)/10				327.61	
					say	327.60	
	Note	1.Scaffolding is already included in item no. 13.1					
		2.The number of masons and Mazdoors already catered in the cement mortar have been taken into account while providing these categories in brick masonry, pointing and plastering.					
13.4	1400 & 2200	Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specifications					
		A Random Rubble Masonry (coursed/uncoursed)					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Stone	cum	1.00	1297.45	1297.45	M-148
		Through and bond stone	No	7.00	45.45	318.18	M-182
		(7no.x0.24mx0.24mx0.39m = 0.16 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.33	11830.00	3903.90	Item 12.6 (A)
		b) Labour					
		Mate	day	0.10	582.53	58.25	L-12
		Mason	day	1.20	635.48	762.58	L-11
		Mazdoor	day	1.20	529.57	635.48	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add for scaffolding @ 5 per cent of cost of a) Material and b) Labour				348.79	
		c) Overhead charges @ 25% on (a+b)				1831.16	
		d) Contractor's profit @ 16% on (a+b+c)				1464.93	
		Rate per cum (a+b+c+d)				10620.73	
					say	<u>10621.00</u>	
13.4	B	Coursed rubble masonry (first sort)					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Stone	cum	1.10	1297.45	1427.19	M-148
		Through and bond stone	each	7.00	45.45	318.18	M-182
		(7no.x0.24mx0.24mx0.39m = 0.16 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.30	11830.00	3549.00	Item 12.6 (A)
		b) Labour					
		Mate	day	0.12	582.53	69.90	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	1.50	529.57	794.35	L-13
		Add for scaffolding @ 5 per cent of cost of material and labour				355.59	
		c) Overhead charges @ 25% on (a+b)				1866.86	
		d) Contractor's profit @ 16% on (a+b+c)				1493.49	
		Rate per cum (a+b+c+d)				10827.80	
					say	<u>10828.00</u>	
13.4	C	Ashlar masonry (first sort)					
		Plain ashlar					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Stone	cum	1.11	2045.46	2270.46	M-169
		Through and bond stone	each	7.00	45.45	318.18	M-182
		(7no.x0.24mx0.24mx0.39m = 0.16 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.33	11830.00	3903.90	Item 12.6 (A)
		b) Labour for masonry work					
		Mate	day	0.20	582.53	116.51	L-12
		Mason	day	2.50	635.48	1588.71	L-11
		Mazdoor	day	2.50	529.57	1323.92	L-13
		Add for scaffolding @ 5 per cent of cost of a) Material and b) Labour				476.08	
		c) Overhead charges @ 25% on (a+b)				2499.44	
		d) Contractor's profit @ 16% on (a+b+c)				1999.55	
		Rate per cum (a+b+c+d)				14496.77	
					say	<u>14497.00</u>	
	Note	The labour already considered in the cement mortar have been taken into account while providing these categories in the stone masonry works.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.5	1500, 1700 & 2200	Plain/Reinforced cement concrete in sub-structure complete as per drawing and Technical Specifications					
		Unit = cum					
		Taking output = 1 cum					
	A	PCC Grade M15					
	(p)	Height upto 5m					
		Same as Item 12.8 (A) 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.					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (A)				8090.00	Item 12.8 (A)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		809.00	
		e) Overhead charges @ 25% on (a+b+c+d)				2224.75	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1779.80	
		Rate perm (a+b+c+d+e+f)				12903.55	
					say	<u>12904.00</u>	
13.5	B	PCC Grade M20					
	(p)	Height upto 5m					
		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.					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (B)				8923.00	Item 12.8 (B) PCC
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		892.30	
		e) Overhead charges @ 25% on (a+b+c+d)				2453.83	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1963.06	
		Rate perm (a+b+c+d+e+f)				14232.19	
					say	<u>14232.00</u>	
13.5	C	PCC Grade M25					
	(p)	Height upto 5m					
		Same as Item 12.8 (D) upto 5 m height with the only change that the provision of form work shall be 10 per cent instead of 3.75 per cent of cost of material, labour and machinery.					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (D) Case I				9320.00	Item 12.8 (D)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		932.00	
		e) Overhead charges @ 25% on (a+b+c+d)				2563.00	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				2050.40	
		Rate perm (a+b+c+d+e+f)				14865.40	
					say	<u>14865.00</u>	
13.5 C (p)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (D) Case II				6896.00	Item 12.8 (D)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		689.60	
		e) Overhead charges @ 25% on (a+b+c+d)				1896.40	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1517.12	
		Rate perm (a+b+c+d+e+f)				10999.12	
					say	<u>10999.00</u>	
13.5 C	(q)	Height 5m to 10m					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Same as Item 12.8 (D) with the following changes: (i) Add 2 per cent of cost of material, Labour and machinery excluding form work to cater for extra lift. (ii) The provision of form work shall be 12 per cent instead of 3.75 per cent of cost of material, labour and machinery.					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (D) Case I				9320.00	Item 12.8 (D)
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		1118.40	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		186.40	
		e) Overhead charges @ 25% on (a+b+c+d)				2656.20	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				2124.96	
		Rate perm (a+b+c+d+e+f)				15405.96	
					say	<u>15406.00</u>	
13.5 C (q)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (D) Case II				6896.00	
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		827.52	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		137.92	
		e) Overhead charges @ 25% on (a+b+c+d)				1965.36	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1572.29	
		Rate perm (a+b+c+d+e+f)				11399.09	
					say	<u>11399.00</u>	
13.5 C	(r)	Height above 10m					
		Same as Item 12.8 (D) with the following changes: (i) Add 4 per cent of cost of material, labour and machinery excluding form work to cater for extra lift. (ii) The provision of form work shall be 15 per cent instead of 3.75 per cent of cost of material, labour and machinery.					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (D) Case I				9320.00	Item 12.8 (D)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1398.00	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		372.80	
		e) Overhead charges @ 25% on (a+b+c+d)				2772.70	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				2218.16	
		Rate perm (a+b+c+d+e+f)				16081.66	
					say	<u>16082.00</u>	
13.5 C (r)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (D) Case II				6896.00	Item 12.8 (D)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1034.40	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		275.84	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Overhead charges @ 25% on (a+b+c+d)				2051.56	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1641.25	
		Rate perm (a+b+c+d+e+f)				11899.05	
					say	<u>11899.00</u>	
13.5	D	PCC Grade M30					
	(p)	Height upto 5m					
		Same as Item 12.8 (F) upto 5 m height with the only change that the provision of form work shall be 10 per cent instead of 3.50 per cent of cost of material, labour and machinery.					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case I				9363.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		936.30	
		e) Overhead charges @ 25% on (a+b+c+d)				2574.83	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				2059.86	
		Rate perm (a+b+c+d+e+f)				14933.99	
					say	<u>14934.00</u>	
13.5 D (p)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case II				6935.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		693.50	
		e) Overhead charges @ 25% on (a+b+c+d)				1907.13	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1525.70	
		Rate perm (a+b+c+d+e+f)				11061.33	
					say	<u>11061.00</u>	
13.5 D	(q)	Height 5m to 10m					
		Same as Item 12.8 (F) with the following changes: (i) Add 2 per cent of cost of material, Labour and machinery excluding form work to cater for extra lift. (ii) The provision of form work shall be 12 per cent instead of 3.50 per cent of cost of material, labour and machinery.					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case I				9363.00	
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		1123.56	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		187.26	
		e) Overhead charges @ 25% on (a+b+c+d)				2668.46	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				2134.76	
		Rate perm (a+b+c+d+e+f)				15477.04	
					say	<u>15477.00</u>	
13.5 D (q)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case II				6935.00	
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		832.20	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		138.70	
		e) Overhead charges @ 25% on (a+b+c+d)				1976.48	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1581.18	
		Rate perm (a+b+c+d+e+f)				11463.56	
					say	<u>11464.00</u>	
13.5 D	(r)	Height above 10m					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Same as Item 12.8 (F) with the following changes: (i) Add 4 per cent of cost of material, labour and machinery excluding form work to cater for extra lift. (ii) The provision of form work shall be 15 per cent instead of 3.50 per cent of cost of material, labour and machinery.					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case I				9363.00	
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1404.45	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		374.52	
		e) Overhead charges @ 25% on (a+b+c+d)				2785.49	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				2228.39	
		Rate perm (a+b+c+d+e+f)				16155.86	
					say	<u>16156.00</u>	
13.5 D (r)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case II				6935.00	
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1040.25	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		277.40	
		e) Overhead charges @ 25% on (a+b+c+d)				2063.16	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1650.53	
		Rate perm (a+b+c+d+e+f)				11966.34	
					say	<u>11966.00</u>	
13.5	E	RCC Grade M20					
	(p)	Height upto 5m					
		Same as Item 12.8 (C) 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.					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case I				9072.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		907.20	
		e) Overhead charges @ 25% on (a+b+c+d)				2494.80	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1995.84	
		Rate perm (a+b+c+d+e+f)				14469.84	
					say	<u>14470.00</u>	
13.5 E (p)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case II				6657.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		665.70	
		e) Overhead charges @ 25% on (a+b+c+d)				1830.68	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1464.54	
		Rate perm (a+b+c+d+e+f)				10617.92	
					say	<u>10618.00</u>	
13.5 E	(q)	Height 5m to 10m					
		For height, upto 10m, add 2 per cent of cost as above excluding formwork. For cost of formwork add 12 per cent of cost of material, labour and machinery instead of 4 per cent.					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case I				9072.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			d) formwork					
			Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		1088.64	
			Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		181.44	
			e) Overhead charges @ 25% on (a+b+c+d)				2585.52	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				2068.42	
			Rate perm (a+b+c+d+e+f)				14996.02	
						say	<u>14996.00</u>	
13.5 E (q)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case II				6657.00	
			d) formwork					
			Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		798.84	
			Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		133.14	
			e) Overhead charges @ 25% on (a+b+c+d)				1897.25	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1517.80	
			Rate perm (a+b+c+d+e+f)				11004.02	
						say	<u>11004.00</u>	
13.5 E		(r)	Height above 10m					
			Same as Item 12.8 (C) with the following changes: (i) Add 4 per cent of cost of material, labour and machinery excluding form work to cater for extra lift. (ii) The provision of form work shall be 15 per cent instead of 4 per cent of cost of material, labour and machinery.					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case I				9072.00	
			d) formwork					
			Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1360.80	
			Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		362.88	
			e) Overhead charges @ 25% on (a+b+c+d)				2698.92	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				2159.14	
			Rate perm (a+b+c+d+e+f)				15653.74	
						say	<u>15654.00</u>	
13.5 E (r)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case II				6657.00	
			d) formwork					
			Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		998.55	
			Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		266.28	
			e) Overhead charges @ 25% on (a+b+c+d)				1980.46	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1584.37	
			Rate perm (a+b+c+d+e+f)				11486.65	
						say	<u>11487.00</u>	
13.5		F	RCC Grade M25					
		(p)	Height upto 5m					
			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.					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case I				9473.00	
			d) formwork					
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		947.30	
			e) Overhead charges @ 25% on (a+b+c+d)				2605.08	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			f) Contractor's profit @ 16% on (a+b+c+d+e)				2084.06	
			Rate perm (a+b+c+d+e+f)				15109.44	
						say	<u>15109.00</u>	
13.5 F (p)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case II				7666.00	
			d) formwork					
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		766.60	
			e) Overhead charges @ 25% on (a+b+c+d)				2108.15	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1686.52	
			Rate perm (a+b+c+d+e+f)				12227.27	
						say	<u>12227.00</u>	
13.5 F		(q)	Height 5m to 10m					
			For height, upto 10m, add 1.8 per cent of cost as above excluding formwork. For cost of formwork add 11.8 per cent of cost of material, labour and machinery					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case I				9473.00	
			d) formwork					
			Add 11.8 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.80		1117.81	
			Add 1.8 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.80		170.51	
			e) Overhead charges @ 25% on (a+b+c+d)				2690.33	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				2152.27	
			Rate perm (a+b+c+d+e+f)				15603.93	
						say	<u>15604.00</u>	
13.5 F (q)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case II				7666.00	
			d) formwork					
			Add 11.8 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.80		904.59	
			Add 1.8 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.80		137.99	
			e) Overhead charges @ 25% on (a+b+c+d)				2177.14	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1741.72	
			Rate perm (a+b+c+d+e+f)				12627.44	
						say	<u>12627.00</u>	
13.5 F		(r)	Height above 10m					
			For height, above 10m, add 4 per cent of cost as above excluding formwork. For cost of formwork add 15 per cent of cost of material, labour and machinery					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case I				9473.00	
			d) formwork					
			Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1420.95	
			Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		378.92	
			e) Overhead charges @ 25% on (a+b+c+d)				2818.22	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				2254.57	
			Rate perm (a+b+c+d+e+f)				16345.66	
						say	<u>16346.00</u>	
13.5 F (r)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case II				7666.00	
			d) formwork					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1149.90	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		306.64	
		e) Overhead charges @ 25% on (a+b+c+d)				2280.64	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1824.51	
		Rate perm (a+b+c+d+e+f)				13227.68	
					say	<u>13228.00</u>	
13.5		G RCC Grade M30					
		(p) Height upto 5m					
		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.					
		Case I Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (G) Case I				9497.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		949.70	
		e) Overhead charges @ 25% on (a+b+c+d)				2611.68	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				2089.34	
		Rate perm (a+b+c+d+e+f)				15147.72	
					say	<u>15148.00</u>	
13.5 G		Case II With Batching Plant, Transit Mixer and Concrete Pump					
(p)		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (G) Case II				7084.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		708.40	
		e) Overhead charges @ 25% on (a+b+c+d)				1948.10	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1558.48	
		Rate perm (a+b+c+d+e+f)				11298.98	
					say	<u>11299.00</u>	
13.5 G		(q) Height 5m to 10m					
		For height, upto 10m, add 1.6 per cent of cost as above excluding formwork. For cost of formwork add 11.5 per cent of cost of material, labour and machinery					
		Case I Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (G) Case I				9497.00	
		d) formwork					
		Add 11.5 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.50		1092.16	
		Add 1.6 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.60		151.95	
		e) Overhead charges @ 25% on (a+b+c+d)				2685.28	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				2148.22	
		Rate perm (a+b+c+d+e+f)				15574.61	
					say	<u>15575.00</u>	
13.5 G		Case II With Batching Plant, Transit Mixer and Concrete Pump					
(q)		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (G) Case II				7084.00	
		d) formwork					
		Add 11.5 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.50		814.66	
		Add 1.6 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.60		113.34	
		e) Overhead charges @ 25% on (a+b+c+d)				2003.00	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				1602.40	
		Rate perm (a+b+c+d+e+f)				11617.41	
					say	<u>11617.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.5 G		(r)	Height above 10m					
			For height, above 10m, add 3.5 per cent of cost as above excluding formwork. For cost of formwork add 14 per cent of cost of material, labour and machinery					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (G) Case I				9497.00	
			d) formwork					
			Add 14 per cent of cost of material, labour and machinery (a+b+c) for Formwork		14.00		1329.58	
			Add 3.5 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.50		332.40	
			e) Overhead charges @ 25% on (a+b+c+d)				2789.74	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				2231.80	
			Rate perm (a+b+c+d+e+f)				16180.51	
						say	<u>16181.00</u>	
13.5 G (r)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (G) Case II				7084.00	
			d) formwork					
			Add 14 per cent of cost of material, labour and machinery (a+b+c) for Formwork		14.00		991.76	
			Add 3.5 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.50		247.94	
			e) Overhead charges @ 25% on (a+b+c+d)				2080.93	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1664.74	
			Rate perm (a+b+c+d+e+f)				12069.37	
						say	<u>12069.00</u>	
13.5		H	RCC Grade M35					
		(p)	Height upto 5m					
			Same as Item 12.8 (H) upto 5m height, excluding formwork. For cost of formwork, add 10 per cent of cost of material, labour and machinery instead of 3 per cent.					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case I				9607.00	
			d) formwork					
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		960.70	
			e) Overhead charges @ 25% on (a+b+c+d)				2641.93	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				2113.54	
			Rate perm (a+b+c+d+e+f)				15323.17	
						say	<u>15323.00</u>	
13.5 H (p)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case II				7829.00	
			d) formwork					
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		782.90	
			e) Overhead charges @ 25% on (a+b+c+d)				2152.98	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1722.38	
			Rate perm (a+b+c+d+e+f)				12487.26	
						say	<u>12487.00</u>	
13.5 H		(q)	Height 5m to 10m					
			For height, upto 10m, add 1.4 per cent of cost as above excluding formwork. For cost of formwork add 11 per cent of cost of material, labour and machinery.					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case I				9607.00	
			d) formwork					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Add 11 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.00		1056.77	
			Add 1.4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.40		134.50	
			e) Overhead charges @ 25% on (a+b+c+d)				2699.57	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				2159.65	
			Rate perm (a+b+c+d+e+f)				15657.49	
						say	<u>15657.00</u>	
13.5 H (q)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case II				7829.00	
			d) formwork					
			Add 11 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.00		861.19	
			Add 1.4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.40		109.61	
			e) Overhead charges @ 25% on (a+b+c+d)				2199.95	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1759.96	
			Rate perm (a+b+c+d+e+f)				12759.70	
						say	<u>12760.00</u>	
13.5 H		(r)	Height above 10m					
			For height, above 10m, add 3 per cent of cost as above excluding formwork. For cost of formwork add 13 per cent of cost of material, labour and machinery					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case I				9607.00	
			d) formwork					
			Add 13 per cent of cost of material, labour and machinery (a+b+c) for Formwork		13.00		1248.91	
			Add 3 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.00		288.21	
			e) Overhead charges @ 25% on (a+b+c+d)				2786.03	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				2228.82	
			Rate perm (a+b+c+d+e+f)				16158.97	
						say	<u>16159.00</u>	
13.5 H (r)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case II				7829.00	
			d) formwork					
			Add 13 per cent of cost of material, labour and machinery (a+b+c) for Formwork		13.00		1017.77	
			Add 3 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.00		234.87	
			e) Overhead charges @ 25% on (a+b+c+d)				2270.41	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				1816.33	
			Rate perm (a+b+c+d+e+f)				13168.38	
						say	<u>13168.00</u>	
		Note	The basic components of this analysis are the same as those of items 13.8 (A to H). The only changes are as under:					
			a) Ramps/Stairs: Extra expenditure on structures which are more than 5 m high @ 2 per cent of cost for height upto 10 m and 4 per cent for heights above 10 m will be involved for approaching the work spot by providing higher ramp/stair case for use by the working parties.					
			b) The above mentioned percentages have been suitably modified for different categories as cost for various categories varies, whereas effort for access for same height will be similar. As the cost of richer concrete is comparatively more, the percentage to be added has been reduced to maintain the same cost for extra efforts.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.6	Section 1600 & 2200	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and Technical Specifications					
		Output: MT					
		Taking output = 1 MT					
		a) Material					
		HYSD bars including 5 per cent overlaps and wastage	tonne	1.05	52915.23	55560.99	M-082
		Binding wire	kg	6.00	87.43	524.59	M-072
		b) Labour for cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.34	582.53	198.06	L-12
		Blacksmith	day	2.00	635.48	1270.97	L-02
		Mazdoor	day	6.50	529.57	3442.20	L-13
		c) Overhead charges @ 25% on (a+b)				15249.20	
		d) Contractor's profit @ 16% on (a+b+c)				12199.36	
		Rate for per MT (a+b+c+d)				88445.38	
					say	<u>88445.00</u>	
13.7	1600 & 2200	Supplying, fitting and placing Mild steel reinforcement complete in sub-structure as per drawing and Technical Specification					
		Unit = MT					
		Taking output = 1 MT					
		a) Material					
		MS bars including 5 per cent overlaps and wastage	tonne	1.05	52915.23	55560.99	M-126
		Binding wire	kg	6.00	87.43	524.59	M-072
		b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.28	582.53	163.11	L-12
		Blacksmith	day	1.50	635.48	953.23	L-02
		Mazdoor	day	5.50	529.57	2912.63	L-13
		c) Overhead charges @ 25% on (a+b)				15028.64	
		d) Contractor's profit @ 16% on (a+b+c)				12022.91	
		Rate for per MT (a+b+c+d)				87166.10	
					say	<u>87166.00</u>	
13.8	2706 & 2200	Providing weep holes in Brick masonry/Plain/ Reinforced concrete abutment, wing wall/ return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical Specifications					
		Unit = Nos.					
		Taking output = 30 Nos.					
		a) Material					
		AC pipe 100 mm dia. (including wastage @ 5 per cent)	metre	31.50	442.41	13935.78	M-056
		Average length of weep hole is taken as one metre for the purpose of estimating.					
		MS clamp	each.	30.00	14.80	443.89	M-123
		collar for AC pipe (average) taking 10% of above pipe rate	each.	10.00	44.24	442.41	M-056/10
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.05	11830.00	591.50	Item 12.6 (A)
		b) Labour					
		Mate	day	0.03	582.53	17.48	L-12
		Mason	day	0.50	635.48	317.74	L-11
		Mazdoor	day	0.25	529.57	132.39	L-13
		c) Overhead charges @ 25% on (a+b)				3970.30	
		d) Contractor's profit @ 16% on (a+b+c)				3176.24	
		Cost for 30 m = a+b+c+d				23027.72	
		Rate per m (a+b+c+d)/30				767.59	
					say	<u>768.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	Note	1. In case of stone masonry, the size of the weep hole shall be 150 mm x 80 mm or circular with 150 mm diameter.					
		2. For structure in stone masonry, the weep holes shall be deemed to be included in the item of stone masonry work and shall not be paid separately.					
13.9	710.1.4. of IRC:78 & 2200	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical Specification					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
	A	Granular material					
		a) Labour					
		Mate	day	0.28	582.53	163.11	L-12
		Mazdoor	day	7.00	529.57	3706.99	L-13
		b) Material					
		Granular material	cum	12.00	1516.69	18200.28	M-009
		c) Machinery					
		Plate compactor/power rammer	hour	2.50	187.94	469.86	P&M-086
		Water Tanker	hour	0.05	819.77	40.99	P&M-060
		d) Overhead charges @ 25% on (a+b+c)				5645.31	
		e) Contractor's profit @ 16% on (a+b+c+d)				4516.25	
		Cost for 10 cum of granular backfill = a+b+c+d+e				32742.78	
		Rate per cum = (a+b+c+d+e)/10				3274.28	
					say	<u>3274.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.9	B	Sandy material					
		a) Labour					
		Mate	day	0.28	582.53	163.11	L-12
		Mazdoor for filling, watering, ramming etc.	day	7.00	529.57	3706.99	L-13
		b) Material					
		Sand	cum	12.00	6624.31	79491.75	M-006
		c) Machinery					
		Plate compactor/power rammer	hour	2.50	187.94	469.86	P&M-086
		Water Tanker	hour	0.06	819.77	49.19	P&M-060
		d) Overhead charges @ 25% on (a+b+c)				20970.22	
		e) Contractor's profit @ 16% on (a+b+c+d)				16776.18	
		Cost for 10 cum of sandy backfill = a+b+c+d+e				121627.30	
		Rate per cum = (a+b+c+d+e)/10				12162.73	
					say	12163.00	
13.10	710.1.4. of IRC:78 and 2200	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical Specification.					
		Unit = cum					
		Taking output = 10 cum.					
		a) Labour					
		Mate	day	0.32	582.53	186.41	L-12
		Mazdoor for filling, watering, ramming etc.	day	7.00	529.57	3706.99	L-13
		Mazdoor (Skilled)	day	1.00	688.44	688.44	L-15
		b) Material					
		Filter media of stone aggregate conforming to clause 2504.2.2. of MoRTH specifications.	cum	12.00	1919.16	23029.94	M-012
		c) Machinery					
		Water Tanker of 6 KL capacity	hour	0.06	819.77	49.19	P&M-060
		d) Overhead charges @ 25% on (a+b+c)				6915.24	
		e) Contractor's profit @ 16% on (a+b+c+d)				5532.19	
		cost for 10 cum of Filter Media = a+b+c+d+e				40108.39	
		Rate per cum = (a+b+c+d+e)/10				4010.84	
					say	4011.00	
13.11	2000, 1000 & 2200	Supplying, fitting and fixing in position true to line and level cast steel rocker bearing conforming to IRC: 83(Pt. 1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.					
		Unit: one tonne capacity					
		Considering a 250 tonne capacity bearing for this analysis					
		a) Labour					
		Mate	day	0.06	582.53	34.95	L-12
		Mazdoor (Skilled)	day	0.50	688.44	344.22	L-15
		Mazdoor	day	1.00	529.57	529.57	L-13
		b) Material					
		Cast steel rocker bearing assembly of 250 tonne design load capacity duly painted complete with all its components as per drawing and specifications	each.	1.00	120066.58	120066.58	M-065
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.				1200.67	
		c) Overhead charges @ 25% on (a+b)				30544.00	
		d) Contractor's profit @ 16% on (a+b+c)				24435.20	
		cost for 250 tonnes capacity bearing = a+b+c+d				177155.19	
		Rate per tonne capacity = (a+b+c+d)/250				708.62	
					say	709.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.12	2000 , 1000 & 2200	Supplying, fitting and fixing in position true to line and level forged steel roller bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.					
		Unit: one tonne capacity					
		Considering a 250 tonne capacity bearing for this analysis					
		a) Labour					
		Mate	day	0.06	582.53	34.95	L-12
		Mazdoor	day	1.00	529.57	529.57	L-13
		Mazdoor (Skilled)	day	0.50	688.44	344.22	L-15
		b) Material					
		Forged steel roller bearing of 250 tonne design load capacity duly painted complete with all its components as per drawing and specifications	each.	1.00	112362.95	112362.95	M-067
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.				1123.63	
		c) Overhead charges @ 25% on (a+b)				28598.83	
		d) Contractor's profit @ 16% on (a+b+c)				22879.06	
		cost for 250 tonnes capacity bearing = a+b+c+d				165873.22	
		Rate per tonne capacity = (a+b+c+d)/250				663.49	
					say	663.00	
13.13	2000 & 2200	Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel complete including all accessories as per drawing and Technical Specifications and BS: 5400, section 9.1 & 9.2 (for PTFE) and clause 2004 of MoRTH Specifications.					
		Unit: one tonne capacity					
		Considering a 80 tonne capacity bearing for this analysis					
		a) Labour					
		Mate	day	0.06	582.53	34.95	L-12
		Mazdoor	day	1.00	529.57	529.57	L-13
		Mazdoor (Skilled)	day	0.50	688.44	344.22	L-15
		b) Material					
		PTFE sliding plate bearing assembly of 80 tonnes design load capacity duly painted complete with all its components as per drawing and Technical Specifications	each.	1.00	202652.96	202652.96	M-069
		Add 1 per cent for foundation anchorage bolts and consumables.				2026.53	
		c) Overhead charges @ 25% on (a+b)				51397.06	
		d) Contractor's profit @ 16% on (a+b+c)				41117.65	
		cost for 80 tonnes capacity bearing = a+b+c+d				298102.93	
		Rate per tonne capacity = (a+b+c+d)/80				3726.29	
					say	3726.00	
13.14	2000 & 2200	Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and clause 2005 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.					
		Unit: one cubic centimetre					
		Considering an elastomeric bearing of size 500 x 400 x 96 mm for this analysis.					
		Overall volume - 19200 cu.cm					
		Volume of 6 nos. 488 x 388 x 4 mm size reinforcing steel plates = 4545 cu.cm.					
		Hence volume of elastomer = 14655 cu.cm.					
		a) Labour					
		Mate	day	0.06	582.53	34.95	L-12
		Mazdoor	day	1.00	529.57	529.57	L-13
		Mazdoor (Skilled)	day	0.50	688.44	344.22	L-15
		b) Material					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Elastomeric bearing assembly consisting of 7 layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanisation, complete with all components as per drawing and Technical Specifications.	each.	1.00	116150.03	116150.03	M-066
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.				1161.50	
		c) Overhead charges @ 25% on (a+b)				29555.07	
		d) Contractor's profit @ 16% on (a+b+c)				23644.06	
		cost for 19200cc of elastomeric bearing = a+b+c+d				171419.40	
		Rate per cc of elastomeric bearing = (a+b+c+d)/19200				8.93	
					say	8.90	
13.15	2000 & 2200	Supplying, fitting and fixing in position true to line and level sliding plate bearing with stainless steel plate sliding on stainless steel plate with mild steel matrix complete including all accessories as per drawing and Technical Specifications.					
		Unit: one tonne capacity					
		Considering the sliding bearing of 80 tonnes design capacity for this analysis.					
		a) Labour					
		Mate	day	0.04	582.53	23.30	L-12
		Mazdoor	day	0.75	529.57	397.18	L-13
		Mazdoor (Skilled)	day	0.35	688.44	240.95	L-15
		b) Material					
		Supply of sliding plate bearing of 80 tonne design capacity complete as per drawings and Technical Specifications.	each.	1.00	202652.96	202652.96	M-070
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.				2026.53	
		c) Overhead charges @ 25% on (a+b)				51335.23	
		d) Contractor's profit @ 16% on (a+b+c)				41068.18	
		cost for 80 tonnes of capacity bearing = a+b+c+d				297744.34	
						3721.80	
					say	3722.00	
13.16	2000 & 2200	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.					
		Unit: one tonne capacity			387.20		
		Considering a Pot bearing assembly of 250 tonne capacity for this analysis.					
		a) Labour					
		Mate	day	0.08	582.53	46.60	L-12
		Mazdoor	day	1.50	529.57	794.35	L-13
		Mazdoor (Skilled)	day	0.50	688.44	344.22	L-15
		b) Material					
		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	112362.95	112362.95	M-068
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.				1123.63	
		c) Overhead charges @ 25% on (a+b)				28667.94	
		d) Contractor's profit @ 16% on (a+b+c)				22934.35	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		cost for 250 tonnes capacity bearing = a+b+c+d				166274.05	
		Rate per tonne capacity = (a+b+c+d)/250				665.10	
					say	<u>665.00</u>	

CHAPTER-14								
SUPER-STRUCTURE								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1	1500 & 1600 1700		Furnishing and Placing Reinforced/ Prestressed cement concrete in super-structure as per drawing and Technical Specification					
		A	RCC Grade M20					
		Case I	Using Concrete Mixer					
			Unit = 1 cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	5.12	7169.28	36706.71	M-081
			Coarse sand	cum	6.75	6977.61	47098.89	M-005
			20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
			10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
			b) Labour					
			Mate	day	0.86	582.53	500.97	L-12
			Mason	day	1.50	635.48	953.23	L-11
			Mazdoor	day	20.00	529.57	10591.40	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
			Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum		135423.00			
			For formwork and staging add the following:					
14.1A Case I		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				135423.00	
			d) Formwork and staging 20 per cent of (a+b+c)		20.00		27084.60	
			e) Overhead charges @ 25% on (a+b+c+d)				40626.90	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				32501.52	
			Cost for 15 cum = a+b+c+d+e+f				235636.02	
			Rate per cum = (a+b+c+d+e+f)/15				15709.07	
						say	<u>15709.00</u>	
14.1A Case I (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				135423.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		33855.75	
			e) Overhead charges @ 25% on (a+b+c+d)				42319.69	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				33855.75	
			Cost for 15 cum = a+b+c+d+e+f				245454.19	
			Rate per cum = (a+b+c+d+e+f)/15				16363.61	
						say	<u>16364.00</u>	
14.1A Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				135423.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		40626.90	
			e) Overhead charges @ 25% on (a+b+c+d)				44012.48	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				35209.98	
			Cost for 15 cum = a+b+c+d+e+f				255272.36	
			Rate per cum = (a+b+c+d+e+f)/15				17018.16	
						say	<u>17018.00</u>	
14.1A Case I		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				135423.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		33855.75	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			e) Overhead charges @ 25% on (a+b+c+d)				42319.69	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				33855.75	
			Cost for 15 cum = a+b+c+d+e+f				245454.19	
			Rate per cum = (a+b+c+d+e+f)/15				16363.61	
						say	<u>16364.00</u>	
14.1A Case I (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				135423.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		40626.90	
			e) Overhead charges @ 25% on (a+b+c+d)				44012.48	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				35209.98	
			Cost for 15 cum = a+b+c+d+e+f				255272.36	
			Rate per cum = (a+b+c+d+e+f)/15				17018.16	
						say	<u>17018.00</u>	
14.1A Case I (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				135423.00	
			d) Formwork and staging 35 per cent of (a+b+c)		35.00		47398.05	
			e) Overhead charges @ 25% on (a+b+c+d)				45705.26	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				36564.21	
			Cost for 15 cum = a+b+c+d+e+f				265090.52	
			Rate per cum = (a+b+c+d+e+f)/15				17672.70	
						say	<u>17673.00</u>	
14.1A		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
			a) Material					
			Cement	tonne	40.92	7169.28	293366.94	M-081
			Coarse sand	cum	54.00	1297.45	70062.10	M-004
			20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
			10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
			b) Labour					
			Mate	day	0.84	582.53	489.32	L-12
			Mason	day	3.00	635.48	1906.45	L-11
			Mazdoor	day	18.00	529.57	9532.26	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
			Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
			Loader	hour	6.00	930.98	5585.90	P&M-017
			Transit Mixer (capacity 4.0 cu.m)					
			Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	165.23	2478.39	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	Lead =10 km & P&M-050
			Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		793498.00			

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		For formwork and staging add the following:					
14.1A Case II	(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				793498.00	
		d) Formwork and staging 20 per cent of (a+b+c)		20.00		158699.60	
		e) Overhead charges @ 25% on (a+b+c+d)				238049.40	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				190439.52	
		Cost for 120 cum = a+b+c+d+e+f				1380686.52	
		Rate per cum = (a+b+c+d+e+f)/120				11505.72	
					say	<u>11506.00</u>	
14.1A Case II (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				793498.00	
		d) Formwork and staging 25 per cent of (a+b+c)		25.00		198374.50	
		e) Overhead charges @ 25% on (a+b+c+d)				247968.13	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				198374.50	
		Cost for 120 cum = a+b+c+d+e+f				1438215.13	
		Rate per cum = (a+b+c+d+e+f)/120				11985.13	
					say	<u>11985.00</u>	
14.1A Case II (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				793498.00	
		d) Formwork and staging 30 per cent of (a+b+c)		30.00		238049.40	
		e) Overhead charges @ 25% on (a+b+c+d)				257886.85	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				206309.48	
		Cost for 120 cum = a+b+c+d+e+f				1495743.73	
		Rate per cum = (a+b+c+d+e+f)/120				12464.53	
					say	<u>12465.00</u>	
14.1A Case II	(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				793498.00	
		d) Formwork and staging 25 per cent of (a+b+c)		25.00		198374.50	
		e) Overhead charges @ 25% on (a+b+c+d)				247968.13	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				198374.50	
		Cost for 120 cum = a+b+c+d+e+f				1438215.13	
		Rate per cum = (a+b+c+d+e+f)/120				11985.13	
					say	<u>11985.00</u>	
14.1A Case II (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				793498.00	
		d) Formwork and staging 30 per cent of (a+b+c)		30.00		238049.40	
		e) Overhead charges @ 25% on (a+b+c+d)				257886.85	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				206309.48	
		Cost for 120 cum = a+b+c+d+e+f				1495743.73	
		Rate per cum = (a+b+c+d+e+f)/120				12464.53	
					say	<u>12465.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1A Case II (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				793498.00	
			d) Formwork and staging 35 per cent of (a+b+c)		35.00		277724.30	
			e) Overhead charges @ 25% on (a+b+c+d)				267805.58	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				214244.46	
			Cost for 120 cum = a+b+c+d+e+f				1553272.34	
			Rate per cum = (a+b+c+d+e+f)/120				12943.94	
						say	12944.00	
14.1		B	RCC Grade M25					
		Case I	Using Concrete Mixer					
			Unit = 1 cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	5.99	7169.28	42943.99	M-081
			Coarse sand	cum	6.75	6977.61	47098.89	M-005
			20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
			10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
			b) Labour					
			Mate	day	0.86	582.53	500.97	L-12
			Mason	day	1.50	635.48	953.23	L-11
			Mazdoor	day	20.00	529.57	10591.40	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
			Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum		141660.00			
			For formwork and staging add the following:					
14.1B Case I		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				141660.00	
			d) Formwork and staging 20 per cent of (a+b+c)		20.00		28332.00	
			e) Overhead charges @ 25% on (a+b+c+d)				42498.00	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				33998.40	
			Cost for 15 cum = a+b+c+d+e+f				246488.40	
			Rate per cum = (a+b+c+d+e+f)/15				16432.56	
						say	16433.00	
14.1B Case I (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				141660.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		35415.00	
			e) Overhead charges @ 25% on (a+b+c+d)				44268.75	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				35415.00	
			Cost for 15 cum = a+b+c+d+e+f				256758.75	
			Rate per cum = (a+b+c+d+e+f)/15				17117.25	
						say	17117.00	
14.1B Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				141660.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		42498.00	
			e) Overhead charges @ 25% on (a+b+c+d)				46039.50	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				36831.60	
			Cost for 15 cum = a+b+c+d+e+f				267029.10	
			Rate per cum = (a+b+c+d+e+f)/15				17801.94	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
						say	<u>17802.00</u>	
14.1B Case I		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				141660.00	
		d)	Formwork and staging 25 per cent of (a+b+c)		25.00		35415.00	
		e)	Overhead charges @ 25% on (a+b+c+d)				44268.75	
		f)	Contractor's profit @ 16% on (a+b+c+d+e)				35415.00	
			Cost for 15 cum = a+b+c+d+e+f				256758.75	
			Rate per cum = (a+b+c+d+e+f)/15				17117.25	
						say	<u>17117.00</u>	
14.1B Case I (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				141660.00	
		d)	Formwork and staging 30 per cent of (a+b+c)		30.00		42498.00	
		e)	Overhead charges @ 25% on (a+b+c+d)				46039.50	
		f)	Contractor's profit @ 16% on (a+b+c+d+e)				36831.60	
			Cost for 15 cum = a+b+c+d+e+f				267029.10	
			Rate per cum = (a+b+c+d+e+f)/15				17801.94	
						say	<u>17802.00</u>	
14.1B Case I (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				141660.00	
		d)	Formwork and staging 35 per cent of (a+b+c)		35.00		49581.00	
		e)	Overhead charges @ 25% on (a+b+c+d)				47810.25	
		f)	Contractor's profit @ 16% on (a+b+c+d+e)				38248.20	
			Cost for 15 cum = a+b+c+d+e+f				277299.45	
			Rate per cum = (a+b+c+d+e+f)/15				18486.63	
						say	<u>18487.00</u>	
14.1B Case II			Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
		a)	Material					
			Cement	tonne	47.95	7169.28	343766.98	M-081
			Coarse sand	cum	54.20	1297.45	70321.59	M-004
			20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
			10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		b)	Labour					
			Mate	day	0.84	582.53	489.32	L-12
			Mason	day	3.00	635.48	1906.45	L-11
			Mazdoor	day	18.00	529.57	9532.26	L-13
		c)	Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
			Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
			Loader	hour	6.00	930.98	5585.90	P&M-017
			Transit Mixer (capacity 4.0 cu.m)					
			Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	165.23	2478.39	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	Lead =10 km & P&M-050
			Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		844158.00			
			For formwork and staging add the following:					
14.1B Case II		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
		(p)	Height upto 5m					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				844158.00	
		d) Formwork and staging 20 per cent of (a+b+c)		20.00		168831.60	
		e) Overhead charges @ 25% on (a+b+c+d)				253247.40	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				202597.92	
		Cost for 120 cum = a+b+c+d+e+f				1468834.92	
		Rate per cum = (a+b+c+d+e+f)/120				12240.29	
					say	<u>12240.00</u>	
14.1B Case II (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				844158.00	
		d) Formwork and staging 25 per cent of (a+b+c)		25.00		211039.50	
		e) Overhead charges @ 25% on (a+b+c+d)				263799.38	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				211039.50	
		Cost for 120 cum = a+b+c+d+e+f				1530036.38	
		Rate per cum = (a+b+c+d+e+f)/120				12750.30	
					say	<u>12750.00</u>	
14.1B Case II (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				844158.00	
		d) Formwork and staging 30 per cent of (a+b+c)		30.00		253247.40	
		e) Overhead charges @ 25% on (a+b+c+d)				274351.35	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				219481.08	
		Cost for 120 cum = a+b+c+d+e+f				1591237.83	
		Rate per cum = (a+b+c+d+e+f)/120				13260.32	
					say	<u>13260.00</u>	
14.1B Case II	(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				844158.00	
		d) Formwork and staging 25 per cent of (a+b+c)		25.00		211039.50	
		e) Overhead charges @ 25% on (a+b+c+d)				263799.38	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				211039.50	
		Cost for 120 cum = a+b+c+d+e+f				1530036.38	
		Rate per cum = (a+b+c+d+e+f)/120				12750.30	
					say	<u>12750.00</u>	
14.1B Case II (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				844158.00	
		d) Formwork and staging 30 per cent of (a+b+c)		30.00		253247.40	
		e) Overhead charges @ 25% on (a+b+c+d)				274351.35	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				219481.08	
		Cost for 120 cum = a+b+c+d+e+f				1591237.83	
		Rate per cum = (a+b+c+d+e+f)/120				13260.32	
					say	<u>13260.00</u>	
14.1B Case II (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				844158.00	
		d) Formwork and staging 35 per cent of (a+b+c)		35.00		295455.30	
		e) Overhead charges @ 25% on (a+b+c+d)				284903.33	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				227922.66	
		Cost for 120 cum = a+b+c+d+e+f				1652439.29	
		Rate per cum = (a+b+c+d+e+f)/120				13770.33	
					say	<u>13770.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1		C	RCC Grade M 30					
		Case I	Using Concrete Mixer					
			Unit = 1 cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	6.10	7169.28	43732.61	M-081
			Coarse sand	cum	6.75	6977.61	47098.89	M-005
			20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
			10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
			b) Labour					
			Mate	day	0.90	582.53	524.27	L-12
			Mason	day	1.50	635.48	953.23	L-11
			Mazdoor	day	21.00	529.57	11120.97	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
			Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum		143001.00			
			For formwork and staging add the following:					
14.1C Case I		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				143001.00	
			d) Formwork and staging 20 per cent of (a+b+c)		20.00		28600.20	
			e) Overhead charges @ 25% on (a+b+c+d)				42900.30	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				34320.24	
			Cost for 15 cum = a+b+c+d+e+f				248821.74	
			Rate per cum = (a+b+c+d+e+f)/15				16588.12	
						say	<u>16588.00</u>	
14.1C Case I (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				143001.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		35750.25	
			e) Overhead charges @ 25% on (a+b+c+d)				44687.81	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				35750.25	
			Cost for 15 cum = a+b+c+d+e+f				259189.31	
			Rate per cum = (a+b+c+d+e+f)/15				17279.29	
						say	<u>17279.00</u>	
14.1C Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				143001.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		42900.30	
			e) Overhead charges @ 25% on (a+b+c+d)				46475.33	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				37180.26	
			Cost for 15 cum = a+b+c+d+e+f				269556.89	
			Rate per cum = (a+b+c+d+e+f)/15				17970.46	
						say	<u>17970.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1C Case I		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				143001.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		35750.25	
			e) Overhead charges @ 25% on (a+b+c+d)				44687.81	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				35750.25	
			Cost for 15 cum = a+b+c+d+e+f				259189.31	
			Rate per cum = (a+b+c+d+e+f)/15				17279.29	
						say	<u>17279.00</u>	
14.1C Case I (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				143001.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		42900.30	
			e) Overhead charges @ 25% on (a+b+c+d)				46475.33	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				37180.26	
			Cost for 15 cum = a+b+c+d+e+f				269556.89	
			Rate per cum = (a+b+c+d+e+f)/15				17970.46	
						say	<u>17970.00</u>	
14.1C Case I (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				143001.00	
			d) Formwork and staging 35 per cent of (a+b+c)		35.00		50050.35	
			e) Overhead charges @ 25% on (a+b+c+d)				48262.84	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				38610.27	
			Cost for 15 cum = a+b+c+d+e+f				279924.46	
			Rate per cum = (a+b+c+d+e+f)/15				18661.63	
						say	<u>18662.00</u>	
14.1C		Case II	Using Batching Plant, Transit Mixer and Concrete Pump.					
			Unit = cum					
			Taking output = 120 cum					
			a) Material					
			Cement	tonne	48.79	7169.28	349789.17	M-081
			Coarse sand	cum	54.60	1297.45	70840.56	M-004
			20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
			10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
			b) Labour					
			Mate	day	0.88	582.53	512.62	L-12
			Mason	day	3.00	635.48	1906.45	L-11
			Mazdoor	day	19.00	529.57	10061.83	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
			Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
			Loader	hour	6.00	930.98	5585.90	P&M-017
			Transit Mixer (capacity 4.0 cu.m)					
			Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	165.23	2478.39	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	Lead =10 km & P&M-050
			Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		851252.00			
			For formwork and staging add the following:					
14.1C Case II		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
		(p)	Height upto 5m					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				851252.00	
			d) Formwork and staging 20 per cent of (a+b+c)		20.00		170250.40	
			e) Overhead charges @ 25% on (a+b+c+d)				255375.60	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				204300.48	
			Cost for 120 cum = a+b+c+d+e+f				1481178.48	
			Rate per cum = (a+b+c+d+e+f)/120				12343.15	
						say	<u>12343.00</u>	
14.1C Case II (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				851252.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		212813.00	
			e) Overhead charges @ 25% on (a+b+c+d)				266016.25	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				212813.00	
			Cost for 120 cum = a+b+c+d+e+f				1542894.25	
			Rate per cum = (a+b+c+d+e+f)/120				12857.45	
						say	<u>12857.00</u>	
14.1C Case II (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				851252.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		255375.60	
			e) Overhead charges @ 25% on (a+b+c+d)				276656.90	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				221325.52	
			Cost for 120 cum = a+b+c+d+e+f				1604610.02	
			Rate per cum = (a+b+c+d+e+f)/120				13371.75	
						say	<u>13372.00</u>	
14.1C Case II		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				851252.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		212813.00	
			e) Overhead charges @ 25% on (a+b+c+d)				266016.25	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				212813.00	
			Cost for 120 cum = a+b+c+d+e+f				1542894.25	
			Rate per cum = (a+b+c+d+e+f)/120				12857.45	
						say	<u>12857.00</u>	
14.1C Case II (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				851252.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		255375.60	
			e) Overhead charges @ 25% on (a+b+c+d)				276656.90	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				221325.52	
			Cost for 120 cum = a+b+c+d+e+f				1604610.02	
			Rate per cum = (a+b+c+d+e+f)/120				13371.75	
						say	<u>13372.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1C Case II (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				851252.00	
			d) Formwork and staging 35 per cent of (a+b+c)		35.00		297938.20	
			e) Overhead charges @ 25% on (a+b+c+d)				287297.55	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				229838.04	
			Cost for 120 cum = a+b+c+d+e+f				1666325.79	
			Rate per cum = (a+b+c+d+e+f)/120				13886.05	
						say	13886.00	
14.1		D	RCC/PSC Grade M35					
		Case I	Using Concrete Mixer.					
			Unit = 1 cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	6.33	7169.28	45381.54	M-081
			Coarse sand	cum	6.75	6977.61	47098.89	M-005
			20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
			10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
			b) Labour					
			Mate	day	0.90	582.53	524.27	L-12
			Mason	day	1.50	635.48	953.23	L-11
			Mazdoor	day	21.00	529.57	11120.97	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
			Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum		144650.00			
			For formwork and staging add the following:					
14.1D Case I		(i)	For solid slab super-structure, 18-28 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				144650.00	
			d) Formwork and staging 18 per cent of (a+b+c)		18.00		26037.00	
			e) Overhead charges @ 25% on (a+b+c+d)				42671.75	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				34137.40	
			Cost for 15 cum = a+b+c+d+e+f				247496.15	
			Rate per cum = (a+b+c+d+e+f)/15				16499.74	
						say	16500.00	
14.1D Case I (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				144650.00	
			d) Formwork and staging 23 per cent of (a+b+c)		23.00		33269.50	
			e) Overhead charges @ 25% on (a+b+c+d)				44479.88	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				35583.90	
			Cost for 15 cum = a+b+c+d+e+f				257983.28	
			Rate per cum = (a+b+c+d+e+f)/15				17198.89	
						say	17199.00	
14.1D Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				144650.00	
			d) Formwork and staging 28 per cent of (a+b+c)		28.00		40502.00	
			e) Overhead charges @ 25% on (a+b+c+d)				46288.00	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				37030.40	
			Cost for 15 cum = a+b+c+d+e+f				268470.40	
			Rate per cum = (a+b+c+d+e+f)/15				17898.03	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
						say	<u>17898.00</u>	
14.1D Case I		(ii)	For T-beam & slab, 23-33 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				144650.00	
		d)	Formwork and staging 23 per cent of (a+b+c)		23.00		33269.50	
		e)	Overhead charges @ 25% on (a+b+c+d)				44479.88	
		f)	Contractor's profit @ 16% on (a+b+c+d+e)				35583.90	
			Cost for 15 cum = a+b+c+d+e+f				257983.28	
			Rate per cum = (a+b+c+d+e+f)/15				17198.89	
						say	<u>17199.00</u>	
14.1D Case I (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				144650.00	
		d)	Formwork and staging 28 per cent of (a+b+c)		28.00		40502.00	
		e)	Overhead charges @ 25% on (a+b+c+d)				46288.00	
		f)	Contractor's profit @ 16% on (a+b+c+d+e)				37030.40	
			Cost for 15 cum = a+b+c+d+e+f				268470.40	
			Rate per cum = (a+b+c+d+e+f)/15				17898.03	
						say	<u>17898.00</u>	
14.1D Case I (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				144650.00	
		d)	Formwork and staging 33 per cent of (a+b+c)		33.00		47734.50	
		e)	Overhead charges @ 25% on (a+b+c+d)				48096.13	
		f)	Contractor's profit @ 16% on (a+b+c+d+e)				38476.90	
			Cost for 15 cum = a+b+c+d+e+f				278957.53	
			Rate per cum = (a+b+c+d+e+f)/15				18597.17	
						say	<u>18597.00</u>	
14.1D Case I		(iii)	For box girder and balanced cantilever, 38-58 per cent of cost of concrete.					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				144650.00	
		d)	Formwork and staging 38 per cent of (a+b+c)		38.00		54967.00	
		e)	Overhead charges @ 25% on (a+b+c+d)				49904.25	
		f)	Contractor's profit @ 16% on (a+b+c+d+e)				39923.40	
			Cost for 15 cum = a+b+c+d+e+f				289444.65	
			Rate per cum = (a+b+c+d+e+f)/15				19296.31	
						say	<u>19296.00</u>	
14.1D Case I (iii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				144650.00	
		d)	Formwork and staging 48 per cent of (a+b+c)		48.00		69432.00	
		e)	Overhead charges @ 25% on (a+b+c+d)				53520.50	
		f)	Contractor's profit @ 16% on (a+b+c+d+e)				42816.40	
			Cost for 15 cum = a+b+c+d+e+f				310418.90	
			Rate per cum = (a+b+c+d+e+f)/15				20694.59	
						say	<u>20695.00</u>	
14.1D Case I (iii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				144650.00	
		d)	Formwork and staging 58 per cent of (a+b+c)		58.00		83897.00	
		e)	Overhead charges @ 25% on (a+b+c+d)				57136.75	
		f)	Contractor's profit @ 16% on (a+b+c+d+e)				45709.40	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 15 cum = a+b+c+d+e+f				331393.15	
		Rate per cum = (a+b+c+d+e+f)/15				22092.88	
					say	<u>22093.00</u>	
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	tonne	50.64	7169.28	363052.34	M-081
		Coarse sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		b) Labour					
		Mate	day	0.88	582.53	512.62	L-12
		Mason	day	3.00	635.48	1906.45	L-11
		Mazdoor	day	19.00	529.57	10061.83	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer (capacity 4.0 cu.m)					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	165.23	2478.39	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	Lead =10 km & P&M-050
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		863737.00			
		For formwork and staging add the following:					
14.1D Case II	(i)	For solid slab super-structure, 18-28 per cent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				863737.00	
		d) Formwork and staging 18 per cent of (a+b+c)		18.00		155472.66	
		e) Overhead charges @ 25% on (a+b+c+d)				254802.42	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				203841.93	
		Cost for 120 cum = a+b+c+d+e+f				1477854.01	
		Rate per cum = (a+b+c+d+e+f)/120				12315.45	
					say	<u>12315.00</u>	
14.1D Case II (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				863737.00	
		d) Formwork and staging 23 per cent of (a+b+c)		23.00		198659.51	
		e) Overhead charges @ 25% on (a+b+c+d)				265599.13	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				212479.30	
		Cost for 120 cum = a+b+c+d+e+f				1540474.94	
		Rate per cum = (a+b+c+d+e+f)/120				12837.29	
					say	<u>12837.00</u>	
14.1D Case II (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				863737.00	
		d) Formwork and staging 28 per cent of (a+b+c)		28.00		241846.36	
		e) Overhead charges @ 25% on (a+b+c+d)				276395.84	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				221116.67	
		Cost for 120 cum = a+b+c+d+e+f				1603095.87	
		Rate per cum = (a+b+c+d+e+f)/120				13359.13	
					say	<u>13359.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1D Case II	(ii)	For T-beam & slab, 23-33 per cent of (a+b+c)					
		Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				863737.00	
		d) Formwork and staging 23 per cent of (a+b+c)		23.00		198659.51	
		e) Overhead charges @ 25% on (a+b+c+d)				265599.13	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				212479.30	
		Cost for 120 cum = a+b+c+d+e+f				1540474.94	
		Rate per cum = (a+b+c+d+e+f)/120				12837.29	
					say	<u>12837.00</u>	
14.1D Case II (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				863737.00	
		d) Formwork and staging 28 per cent of (a+b+c)		28.00		241846.36	
		e) Overhead charges @ 25% on (a+b+c+d)				276395.84	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				221116.67	
		Cost for 120 cum = a+b+c+d+e+f				1603095.87	
		Rate per cum = (a+b+c+d+e+f)/120				13359.13	
					say	<u>13359.00</u>	
14.1D Case II (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				863737.00	
		d) Formwork and staging 33 per cent of (a+b+c)		33.00		285033.21	
		e) Overhead charges @ 25% on (a+b+c+d)				287192.55	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				229754.04	
		Cost for 120 cum = a+b+c+d+e+f				1665716.80	
		Rate per cum = (a+b+c+d+e+f)/120				13880.97	
					say	<u>13881.00</u>	
14.1D Case II	(iii)	For box girder and balanced cantilever, 38-58 per cent of cost of concrete.					
		Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				863737.00	
		d) Formwork and staging 38 per cent of (a+b+c)		38.00		328220.06	
		e) Overhead charges @ 25% on (a+b+c+d)				297989.27	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				238391.41	
		Cost for 120 cum = a+b+c+d+e+f				1728337.74	
		Rate per cum = (a+b+c+d+e+f)/120				14402.81	
					say	<u>14403.00</u>	
14.1D Case II (iii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				863737.00	
		d) Formwork and staging 48 per cent of (a+b+c)		48.00		414593.76	
		e) Overhead charges @ 25% on (a+b+c+d)				319582.69	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				255666.15	
		Cost for 120 cum = a+b+c+d+e+f				1853579.60	
		Rate per cum = (a+b+c+d+e+f)/120				15446.50	
					say	<u>15446.00</u>	
14.1D Case II (iii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				863737.00	
		d) Formwork and staging 58 per cent of (a+b+c)		58.00		500967.46	
		e) Overhead charges @ 25% on (a+b+c+d)				341176.12	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				272940.89	
		Cost for 120 cum = a+b+c+d+e+f				1978821.47	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Rate per cum = (a+b+c+d+e+f)/120				16490.18	
						say	16490.00	
14.1		E	PSC Grade M-40					
		Case 1	Using concrete mixer.					
			Unit = 1 cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	6.45	7169.28	46241.86	M-081
			Coarse sand	cum	6.75	6977.61	47098.89	M-005
			20 mm Aggregate	cum	8.10	2372.47	19217.03	M-053
			10 mm Aggregate	cum	5.40	2156.41	11644.61	M-051
			Admixture @ 0.4 per cent of cement	kg	25.80	376.63	9717.06	M-180
			b) Labour					
			Mate	day	0.96	582.53	559.23	L-12
			Mason	day	2.00	635.48	1270.97	L-11
			Mazdoor	day	22.00	529.57	11650.54	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	375.99	2255.97	P&M-009
			Generator 33 KVA	hour	6.00	1075.56	6453.34	P&M-079
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum		156110.00			
			For formwork and staging add the following:					
14.1E Case I		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				156110.00	
			d) Formwork and staging 20 per cent of (a+b+c)		20.00		31222.00	
			e) Overhead charges @ 25% on (a+b+c+d)				46833.00	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				37466.40	
			Cost for 15 cum = a+b+c+d+e+f				271631.40	
			Rate per cum = (a+b+c+d+e+f)/15				18108.76	
						say	18109.00	
14.1E Case I (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				156110.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		39027.50	
			e) Overhead charges @ 25% on (a+b+c+d)				48784.38	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				39027.50	
			Cost for 15 cum = a+b+c+d+e+f				282949.38	
			Rate per cum = (a+b+c+d+e+f)/15				18863.29	
						say	18863.00	
14.1E Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				156110.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		46833.00	
			e) Overhead charges @ 25% on (a+b+c+d)				50735.75	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				40588.60	
			Cost for 15 cum = a+b+c+d+e+f				294267.35	
			Rate per cum = (a+b+c+d+e+f)/15				19617.82	
						say	19618.00	
14.1E Case I		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				156110.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		39027.50	
			e) Overhead charges @ 25% on (a+b+c+d)				48784.38	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			f) Contractor's profit @ 16% on (a+b+c+d+e)				39027.50	
			Cost for 15 cum = a+b+c+d+e+f				282949.38	
			Rate per cum = (a+b+c+d+e+f)/15				18863.29	
						say	<u>18863.00</u>	
14.1E Case I (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				156110.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		46833.00	
			e) Overhead charges @ 25% on (a+b+c+d)				50735.75	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				40588.60	
			Cost for 15 cum = a+b+c+d+e+f				294267.35	
			Rate per cum = (a+b+c+d+e+f)/15				19617.82	
						say	<u>19618.00</u>	
14.1E Case I (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				156110.00	
			d) Formwork and staging 35 per cent of (a+b+c)		35.00		54638.50	
			e) Overhead charges @ 25% on (a+b+c+d)				52687.13	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				42149.70	
			Cost for 15 cum = a+b+c+d+e+f				305585.33	
			Rate per cum = (a+b+c+d+e+f)/15				20372.36	
						say	<u>20372.00</u>	
14.1E		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			<i>Unit = cum</i>					
			<i>Taking output = 120 cum</i>					
			a) Material					
			Cement	tonne	51.60	7169.28	369934.85	M-081
			Coarse sand	cum	54.00	1297.45	70062.10	M-004
			20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
			10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
			Admixture @ 0.4 per cent of cement	kg	206.40	376.63	77736.45	M-180
			b) Labour					
			Mate	day	0.94	582.53	547.58	L-12
			Mason	day	3.50	635.48	2224.19	L-11
			Mazdoor	day	20.00	529.57	10591.40	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
			Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
			Loader	hour	6.00	930.98	5585.90	P&M-017
			Transit Mixer (capacity 4.0 cu.m)					
			Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	165.23	2478.39	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	Lead =10 km & P&M-050
			Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		949238.00			
			For formwork and staging add the following:					
14.1E Case II		(i)	For solid/voided slab super-structure, 18-28 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				949238.00	
			d) Formwork and staging 18 per cent of (a+b+c)		18.00		170862.84	
			e) Overhead charges @ 25% on (a+b+c+d)				280025.21	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				224020.17	
			Cost for 15 cum = a+b+c+d+e+f				1624146.22	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Rate per cum = (a+b+c+d+e+f)/120				13534.55	
						say	<u>13535.00</u>	
14.1E Case II (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				949238.00	
			d) Formwork and staging 23 per cent of (a+b+c)		23.00		218324.74	
			e) Overhead charges @ 25% on (a+b+c+d)				291890.69	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				233512.55	
			Cost for 120 cum = a+b+c+d+e+f				1692965.97	
			Rate per cum = (a+b+c+d+e+f)/120				14108.05	
						say	<u>14108.00</u>	
14.1E Case II (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				949238.00	
			d) Formwork and staging 28 per cent of (a+b+c)		28.00		265786.64	
			e) Overhead charges @ 25% on (a+b+c+d)				303756.16	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				243004.93	
			Cost for 120 cum = a+b+c+d+e+f				1761785.73	
			Rate per cum = (a+b+c+d+e+f)/120				14681.55	
						say	<u>14682.00</u>	
14.1E Case II		(ii)	For T-beam & slab, 23-33 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				949238.00	
			d) Formwork and staging 23 per cent of (a+b+c)		23.00		218324.74	
			e) Overhead charges @ 25% on (a+b+c+d)				291890.69	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		f) Contractor's profit @ 16% on (a+b+c+d+e)				233512.55	
		Cost for 120 cum = a+b+c+d+e+f				1692965.97	
		Rate per cum = (a+b+c+d+e+f)/120				14108.05	
					say	<u>14108.00</u>	
14.1E Case II (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				949238.00	
		d) Formwork and staging 28 per cent of (a+b+c)		28.00		265786.64	
		e) Overhead charges @ 25% on (a+b+c+d)				303756.16	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				243004.93	
		Cost for 120 cum = a+b+c+d+e+f				1761785.73	
		Rate per cum = (a+b+c+d+e+f)/120				14681.55	
					say	<u>14682.00</u>	
14.1E Case II (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				949238.00	
		d) Formwork and staging 33 per cent of (a+b+c)		33.00		313248.54	
		e) Overhead charges @ 25% on (a+b+c+d)				315621.64	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				252497.31	
		Cost for 120 cum = a+b+c+d+e+f				1830605.48	
		Rate per cum = (a+b+c+d+e+f)/120				15255.05	
					say	<u>15255.00</u>	
14.1E Case II	(iii)	For cast-in-situ box girder, segment construction and balanced cantilever, 38-58 per cent of cost of concrete.					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				949238.00	
		d) Formwork and staging 38 per cent of (a+b+c)		38.00		360710.44	
		e) Overhead charges @ 25% on (a+b+c+d)				327487.11	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				261989.69	
		Cost for 120 cum = a+b+c+d+e+f				1899425.24	
		Rate per cum = (a+b+c+d+e+f)/120				15828.54	
					say	<u>15829.00</u>	
14.1E Case II (iii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				949238.00	
		d) Formwork and staging 48 per cent of (a+b+c)		48.00		455634.24	
		e) Overhead charges @ 25% on (a+b+c+d)				351218.06	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				280974.45	
		Cost for 120 cum = a+b+c+d+e+f				2037064.75	
		Rate per cum = (a+b+c+d+e+f)/120				16975.54	
					say	<u>16976.00</u>	
14.1E Case II (iii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				949238.00	
		d) Formwork and staging 58 per cent of (a+b+c)		58.00		550558.04	
		e) Overhead charges @ 25% on (a+b+c+d)				374949.01	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				299959.21	
		Cost for 120 cum = a+b+c+d+e+f				2174704.26	
		Rate per cum = (a+b+c+d+e+f)/120				18122.54	
					say	<u>18123.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1F	F	PSC Grade M-45					
		Unit = 1 cum					
		Taking output = 120 cum					
		a) Material					
		Cement	tonne	55.80	7169.28	400045.82	M-081
		Coarse sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		Admixture @ 0.4 per cent of cement	kg	223.20	376.63	84063.84	M-180
		b) Labour					
		Mate	day	0.94	582.53	547.58	L-12
		Mason	day	3.50	635.48	2224.19	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer (capacity 4.0 cu.m)					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	165.23	2478.39	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	Lead =10 km & P&M-050
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		985676.00			
		For formwork and staging add the following:					
14.1F	(i)	For solid slab/voided slab super-structure, 16-26 per cent of cost of concrete (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				985676.00	
		d) Formwork and staging 16 per cent of (a+b+c)		16.00		157708.16	
		e) Overhead charges @ 25% on (a+b+c+d)				285846.04	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				228676.83	
		Cost for 120 cum = a+b+c+d+e+f				1657907.03	
		Rate per cum = (a+b+c+d+e+f)/120				13815.89	
					say	13816.00	
14.1F (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				985676.00	
		d) Formwork and staging 21 per cent of (a+b+c)		21.00		206991.96	
		e) Overhead charges @ 25% on (a+b+c+d)				298166.99	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				238533.59	
		Cost for 120 cum = a+b+c+d+e+f				1729368.54	
		Rate per cum = (a+b+c+d+e+f)/120				14411.40	
					say	14411.00	
14.1F (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				985676.00	
		d) Formwork and staging 26 per cent of (a+b+c)		26.00		256275.76	
		e) Overhead charges @ 25% on (a+b+c+d)				310487.94	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				248390.35	
		Cost for 120 cum = a+b+c+d+e+f				1800830.05	
		Rate per cum = (a+b+c+d+e+f)/120				15006.92	
					say	15007.00	
14.1F	(ii)	For T-beam & slab including launching of precast girders by launching truss upto 40 m span, 21-31 per cent of cost of concrete.					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				985676.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Formwork and staging 21 per cent of (a+b+c)		21.00		206991.96	
		e) Overhead charges @ 25% on (a+b+c+d)				298166.99	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				238533.59	
		Cost for 120 cum = a+b+c+d+e+f				1729368.54	
		Rate per cum = (a+b+c+d+e+f)/120				14411.40	
					say	<u>14411.00</u>	
14.1F (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				985676.00	
		d) Formwork and staging 26 per cent of (a+b+c)		26.00		256275.76	
		e) Overhead charges @ 25% on (a+b+c+d)				310487.94	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				248390.35	
		Cost for 120 cum = a+b+c+d+e+f				1800830.05	
		Rate per cum = (a+b+c+d+e+f)/120				15006.92	
					say	<u>15007.00</u>	
14.1F (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				985676.00	
		d) Formwork and staging 31 per cent of (a+b+c)		31.00		305559.56	
		e) Overhead charges @ 25% on (a+b+c+d)				322808.89	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				258247.11	
		Cost for 120 cum = a+b+c+d+e+f				1872291.56	
		Rate per cum = (a+b+c+d+e+f)/120				15602.43	
					say	<u>15602.00</u>	
14.1F	(iii)	For cast-in-situ box girder, segmental construction and balanced cantilever, 36-56 per cent of cost of concrete.					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				985676.00	
		d) Formwork and staging 36 per cent of (a+b+c)		36.00		354843.36	
		e) Overhead charges @ 25% on (a+b+c+d)				335129.84	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				268103.87	
		Cost for 120 cum = a+b+c+d+e+f				1943753.07	
		Rate per cum = (a+b+c+d+e+f)/120				16197.94	
					say	<u>16198.00</u>	
14.1F (iii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				985676.00	
		d) Formwork and staging 46 per cent of (a+b+c)		46.00		453410.96	
		e) Overhead charges @ 25% on (a+b+c+d)				359771.74	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				287817.39	
		Cost for 120 cum = a+b+c+d+e+f				2086676.09	
		Rate per cum = (a+b+c+d+e+f)/120				17388.97	
					say	<u>17389.00</u>	
14.1F (iii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				985676.00	
		d) Formwork and staging 56 per cent of (a+b+c)		56.00		551978.56	
		e) Overhead charges @ 25% on (a+b+c+d)				384413.64	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				307530.91	
		Cost for 120 cum = a+b+c+d+e+f				2229599.11	
		Rate per cum = (a+b+c+d+e+f)/120				18579.99	
					say	<u>18580.00</u>	
14.1	G	PSC Grade M-50					
		Unit = 1 cum					
		Taking output = 120 cum					
		a) Material					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cement	tonne	58.80	7169.28	421553.66	M-081
		Coarse sand	cum	54.00	1297.45	70062.10	M-004
		20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
		10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
		Admixture @ 0.4 per cent of cement	kg	235.20	376.63	88583.40	M-180
		b) Labour					
		Mate	day	0.94	582.53	547.58	L-12
		Mason	day	3.50	635.48	2224.19	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
		Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
		Loader	hour	6.00	930.98	5585.90	P&M-017
		Transit Mixer (capacity 4.0 cu.m)					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	165.23	2478.39	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	Lead =10 km & P&M-050
		Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		1011704.00			
		For formwork and staging add the following:					
14.1G	(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55 per cent of cost of concrete					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1011704.00	
		d) Formwork and staging 35 per cent of (a+b+c)		35.00		354096.40	
		e) Overhead charges @ 25% on (a+b+c+d)				341450.10	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				273160.08	
		Cost for 120 cum = a+b+c+d+e+f				1980410.58	
		Rate per cum = (a+b+c+d+e+f)/120				16503.42	
					say	<u>16503.00</u>	
14.1G (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1011704.00	
		d) Formwork and staging 45 per cent of (a+b+c)		45.00		455266.80	
		e) Overhead charges @ 25% on (a+b+c+d)				366742.70	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				293394.16	
		Cost for 120 cum = a+b+c+d+e+f				2127107.66	
		Rate per cum = (a+b+c+d+e+f)/120				17725.90	
					say	<u>17726.00</u>	
14.1G (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1011704.00	
		d) Formwork and staging 55 per cent of (a+b+c)		55.00		556437.20	
		e) Overhead charges @ 25% on (a+b+c+d)				392035.30	
		f) Contractor's profit @ 16% on (a+b+c+d+e)				313628.24	
		Cost for 120 cum = a+b+c+d+e+f				2273804.74	
		Rate per cum = (a+b+c+d+e+f)/120				18948.37	
					say	<u>18948.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1		H	PSC Grade M- 55					
			<i>Unit = 1 cum</i>					
			<i>Taking output = 120 cum</i>					
			a) Material					
			Cement	tonne	63.50	7169.28	455249.28	M-081
			Coarse sand	cum	54.00	1297.45	70062.10	M-004
			20 mm Aggregate	cum	64.80	2609.72	169109.88	M-053
			10 mm Aggregate	cum	43.20	2372.05	102472.54	M-051
			Admixture @ 0.4 per cent of cement	kg	254.00	376.63	95664.05	M-180
			b) Labour					
			Mate	day	0.94	582.53	547.58	L-12
			Mason	day	3.50	635.48	2224.19	L-11
			Mazdoor	day	20.00	529.57	10591.40	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2195.60	13173.58	P&M-002
			Generator 100 KVA	hour	6.00	1253.49	7520.95	P&M-080
			Loader	hour	6.00	930.98	5585.90	P&M-017
			Transit Mixer (capacity 4.0 cu.m)					
			Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	165.23	2478.39	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	38.45	115340.32	Lead =10 km & P&M-050
			Concrete Pump	hour	6.00	409.89	2459.32	P&M-007
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		1052480.00			
			For formwork and staging add the following:					
14.1H		(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55 per cent of cost of concrete					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1052480.00	
			d) Formwork and staging 35 per cent of (a+b+c)		35.00		368368.00	
			e) Overhead charges @ 25% on (a+b+c+d)				355212.00	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				284169.60	
			Cost for 120 cum = a+b+c+d+e+f				2060229.60	
			Rate per cum = (a+b+c+d+e+f)/120				17168.58	
						say	<u>17169.00</u>	
14.1H (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1052480.00	
			d) Formwork and staging 45 per cent of (a+b+c)		45.00		473616.00	
			e) Overhead charges @ 25% on (a+b+c+d)				381524.00	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				305219.20	
			Cost for 120 cum = a+b+c+d+e+f				2212839.20	
			Rate per cum = (a+b+c+d+e+f)/120				18440.33	
						say	<u>18440.00</u>	
14.1H (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1052480.00	
			d) Formwork and staging 55 per cent of (a+b+c)		55.00		578864.00	
			e) Overhead charges @ 25% on (a+b+c+d)				407836.00	
			f) Contractor's profit @ 16% on (a+b+c+d+e)				326268.80	
			Cost for 120 cum = a+b+c+d+e+f				2365448.80	
			Rate per cum = (a+b+c+d+e+f)/120				19712.07	
						say	<u>19712.00</u>	
		Note	1.Where ever concrete is carried out using batching plant, transit mixer, concrete pump, admixers conforming IS: 9103 @ 0.4 per cent of weight of cement may be added for achieving desired slump of concrete.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		2. Cement provided for various components of the super structure is for estimating purpose only. Actual quantity of cement will be as per approved mix design. Similarly, the provision for coarse and fine aggregates is for estimating purpose and the exact quantity shall be as per the mix design.					
		3. The items like needle and surface vibrators are part of minor T & P which is already covered under the overhead charges. As such these items have not been added separately in the rate analysis.					
14.2	1600	Supplying, fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications					
		Unit = 1 MT					
		Taking output = 1 MT					
		a) Material					
		HYSD bars including 5 per cent for laps and wastage	tonne	1.05	52915.23	55560.99	M-082
		Binding wire	Kg	8.00	87.43	699.46	M-072
		b) Labour for cutting, bending, tying and placing in position					
		Mate	day	0.44	582.53	256.31	L-12
		Blacksmith	day	3.00	635.48	1906.45	L-02
		Mazdoor	day	8.00	529.57	4236.56	L-13
		Basic Cost of Labour & Material (a+b)		62660.00			
		c) Overhead charges @ 25% on (a+b)				15664.94	
		d) Contractor's profit @ 16% on (a+b+c)				12531.95	
		Rate per MT = a+b+c+d				90856.67	
					say	90857.00	
14.3	1800	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications					
		Unit = 1 MT					
		Taking output = 0.377 MT					
		Details of cost for 12T13 strand 40 m long cable (weight = 0.377 MT)					
		a) Material					
		H.T. Strand @ 9.42 kg/m including 2 per cent for wastage and extra length for jacking	tonne	0.39	127841.44	49218.95	M-119
		Sheathing duct ID 66 mm along with 5 per cent extra length 40 x 1.05 = 42 m.	metre	42.00	16.14	677.93	M-165
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	2.00	758.64	1517.28	M-187
		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	7169.28	896.16	M-081
		Add 0.50 per cent cost of material for Spacers, Insulation tape and miscellaneous items				2615.52	
		b) Labour					
		i) For making and fixing cables, anchorages					
		Mate	day	0.16	582.53	93.20	L-12
		Blacksmith	day	1.00	635.48	635.48	L-02
		Mazdoor	day	3.00	529.57	1588.71	L-13
		ii) For prestressing					
		Mate/Supervisor	day	0.05	582.53	29.13	L-12
		Prestressing operator / Fitter	day	0.25	635.48	158.87	L-08
		Mazdoor	day	1.00	529.57	529.57	L-13
		iii) For grouting					
		Mate/Supervisor	day	0.05	582.53	29.13	L-12
		Mason	day	0.25	635.48	158.87	L-11
		Mazdoor	day	1.00	529.57	529.57	L-13
		c) Machinery					
		Stressing jack with pump	hour	2.50	131.33	328.33	P&M-040
		Grouting pump with agitator	hour	1.00	457.34	457.34	M-111

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Generator 33 KVA.	hour	3.50	1075.56	3764.45	P&M-079
		d) Overhead charges @ 25% on (a+b+c)				2075.66	
		e) Contractor's profit @ 16% on (a+b+c+d)				1660.53	
		Cost for 0.377 MT (a+b+c+d+e)				66964.69	
		Rate per MT = (a+b+c+d+e)/0.377				177625.17	
					say	<u>177625.00</u>	
		Note Cost of HT steel has been taken for delivery at site. Hence carriage has not been considered.					
14.4	2702	Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications					
		Unit = 1 cum					
		Taking output = 1 cum					
		a) Material					
		Cement concrete M30 Grade Refer relevant item of concrete in Item 14.1 excluding formwork	cum	1.00	7094.00	7094.00	Item 14.1(C)
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.075	62657.00	4699.28	Item 14.2 A
		b) Labour					
		Mazdoor for cleaning deck slab concrete surface.	day	0.15	529.57	79.44	L-13
		c) Overhead charges @ 25% on (a+b)				2968.18	
		d) Contractor's profit @ 16% on (a+b+c)				2374.54	
		Rate per cum (a+b+c+d)				17215.43	
					say	<u>17215.00</u>	
14.5	515 & 2702	Mastic Asphalt					
		Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat 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 pre-coated fine grained hard stone chipping of 9.5 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 not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.					
		Unit = sqm					
		Taking output = 72.46 sqm (2 tonnes)/(0.869 cum) assuming a density of 2.3 tonnes/cum.					
		a) Labour					
		Mate	day	0.49	582.53	285.44	L-12
		Mazdoor	day	11.00	529.57	5825.27	L-13
		Mazdoor (Skilled)	day	1.25	688.44	860.55	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	0.06	540.16	32.41	P&M-031
		Air compressor 250 cfm	hour	0.06	887.56	53.25	P&M-001
		Mastic cooker 1 tonne capacity	hour	6.00	536.98	3221.90	P&M-030
		Bitumen boiler 1500 litres capacity	hour	6.00	317.74	1906.45	P&M-005
		Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.00	357.99	357.99	P&M-053
		c) Material					
		Base mastic (without coarse aggregates) = 60 per cent					
		Coarse aggregate(3.35mm to 9.5 mm size) = 40 per cent .					
		Proportion of material required for mastic asphalt with coarse aggregates (based on mix design done by CRRI for a specific case)					
		i) Bitumen 80/100 or 60/70 or 30/40 @ 10.2 per cent by weight of mix. $2 \times 10.2/100 = 0.204$	tonne	0.204	41363.28	8438.11	M-074
		ii) Crusher stone dust @ 31.9 per cent by weight of mix = $2 \times 31.9/100 = 0.638$ tonnes = $0.638/1.625 = 0.39$	cum	0.39	1378.81	537.74	M-021

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		iii) Lime stone dust filler with calcium carbonate 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	0.36	13451.08	4842.39	M-188
		iv) Coarse aggregates 9.5 mm to 3.35 mm size @ 40 per cent by weight of mix = $2 \times 40/100 = 0.8$ MT = $0.8/1.456 = 0.55$	cum	0.55	2156.41	1186.02	M-051
		v) Pre-coated stone chips of 9.5 mm nominal size for skid resistance = $72.46 \times 0.005/10 = 0.036$	cum	0.036	4842.39	174.33	M-142
		vi) Bitumen for coating of chips @ 2 per cent by weight = $0.036 \times 1.456 \times 2/100 = 0.001048$ MT = 1.05kg	kg	1.05	41.36	43.43	M-074/1000
		d) Overhead charges @ 25% on (a+b+c)				6941.32	
		e) Contractor's profit @ 16% on (a+b+c+d)				5553.06	
		Cost for 72.46 sqm = a+b+c+d+e				40259.66	
		Rate per sqm = (a+b+c+d+e)/72.46				555.61	
					say	556.00	
	Note	1.The rates for 6 mm or any other thickness may be worked out on pro-rata basis.					
		2. Where tack coat is required to be provided before laying mastic asphalt, the same is required to be measured and paid separately.					
		3.The quantities of binder, filler and aggregates are for estimating purpose. Exact quantities shall be as per mix design.					
		4.This rate analysis is based on design made by CRRI for a specific case and is meant for estimating purposes only. Actual design is required to be done for each case.					
		5.The quantity of bitumen works out 17 per cent of the mastic asphalt blocks without aggregates and falls within the standards laid down by MoRTH Specifications.					
14.6	2703, 1500, 1600 & 1700	Construction of precast RCC railing of M30 Grade, aggregate size not exceeding 12 mm, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specifications.					
		Unit = 1 RM					
		Taking output = 2 x 24 m span = 48 m					
		a) Material					
		Cement concrete M30 Grade Refer relevant item of concrete in Item 14.1(C) by using batching plant, excluding formwork i.e. per cum basic cost (a+b+c)	cum	4.09	7094.00	29028.65	Item 14.1(C)
		No. of vertical posts = $(12 + 2)/2 = 28$ Nos., External area of vertical post $0.25 \times 0.275 = 0.069$ sqm, Concrete in Vertical posts = $0.069 \times 28 = 1.932$ cum, Hand rail in 3 tiers = $3 \times 24 = 72$ m, External area = $0.170 \times 0.175 = 0.03$ sqm, Concrete in hand rails = $0.03 \times 72 = 2.16$ cum, Total Concrete = $1.932 + 2.16 = 4.092$ cum (Refer MoRTH SD / 202)					
		Add 5 per cent of above cost for form work for casting in casting yard.				1451.43	
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.87	62657.00	54198.31	Item 14.2 A
		Refer MoRTH SD / 202.					
		Add 5 per cent of (a) for handling and fixing of precast panels in position				4233.92	
		b) Overhead charges @ 25% on (a)				22228.08	
		c) Contractor's profit @ 16% on (a+b)				17782.46	
		Rate for 48 m (a+b+c)				128922.84	
		Rate per metre (a+b+c)/48				2685.89	
					say	2686.00	
	Note	1.Quantities of material have been adopted from standard plans of MoRTH vide drawing no. SD/202.					
		2.48 m length is the total linear length adding both sides of 24 m span.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.7	2703, 1500, 1600 & 1700	Construction of RCC railing of M30 Grade in-situ with 20 mm nominal size aggregate, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specifications.					
		Unit = 1 RM					
		Taking output = 2 x 24 m span = 48 m.					
		a) Material					
		Cement concrete M30 Grade Refer relevant item of concrete in Item 14.1(C) by using batching plant, excluding formwork i.e. per cum basic cost (a+b+c)	cum	4.092	7094.00	29028.65	Item 14.1(C)
		No. of vertical posts = (12 + 2)/2 = 28 Nos., External area of vertical post 0.25 x 0.275 = 0.069sqm, Concrete in vehicle posts = 0.069 x 28 = 1.932 cum, Hand rail in 3 tiers = 3 x 24 = 72 m, External area = 0.170 x 0.175 = 0.03 sqm, Concrete in hand rails = 0.03 x 72 = 2.16 cum, Total Concrete = 1.932 + 2.16 = 4.092 cum. (Refer MoRTH SD / 202)					
		Add 12 per cent of above cost for form work.				3483.44	
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.87	62657.00	54198.31	Item 14.2 A
		refer MoRTH SD / 202.					
		b) Overhead charges @ 25% on (a)				21677.60	
		c) Contractor's profit @ 16% on (a+b)				17342.08	
		Rate for 48 m (a+b+c)				125730.07	
		Rate per metre (a+b+c)/48				2619.38	
					say	<u>2619.00</u>	
		Note					
		1. Quantities of material have been adopted from standard plans of MoRTH vide drawing no. SD/202.					
		2. 48 m length is the total linear length adding both sides of 24 m span.					
14.8	2703.2 & 1900	Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification					
		Unit = 1 RM					
		Taking output = 2 x 50 m span = 100 m					
		a) Material:					
		1) ISMC 100 = 2.806 x 1.05 = 2.946 MT	tonne	2.95	60667.13	178725.36	M-179
		2) MS Flat = 0.964 x 1.05 = 1.012 MT	tonne	1.01	60667.13	61395.14	M-179
		3) MS bars = 0.17 x 1.05 = 0.180 MT	tonne	0.18	60667.13	10920.08	M-179
		4) MS bolts, nuts and washers	tonne	0.15	99874.23	14981.14	M-130*1000
		Add @ 5 per cent of cost of material for painting one shop coat with red oxide primer and three coats of synthetic enamel paint and consumables to safeguard against weathering and corrosion.				13301.09	
		Add for cost of concrete for fixing vertical posts in the performed recess @ 1 per cent of cost of material.				2660.22	
		Add for electricity charges, welding and drilling equipment, electrodes and other consumables @ 1 per cent of cost of material.				2660.22	
		b) Labour					
		Mate	day	2.80	582.53	1631.08	L-12
		Mazdoor (Skilled)	day	30.00	688.44	20653.23	L-15
		Mazdoor	day	40.00	529.57	21182.80	L-13
		c) Overhead charges @ 25% on (a+b)				82027.58	
		d) Contractor's profit @ 16% on (a+b+c)				65622.07	
		Cost for 100 m steel railing = a+b+c+d				475759.99	
		Rate per metre (a+b+c+d)/100				4757.60	
					say	<u>4758.00</u>	
14.9	2705	Drainage Spouts complete as per drawing and Technical specification					
		Unit = 1 No.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Taking output = 1 No.					
		a) Material					
		Corrosion resistant Structural steel including 5 per cent wastage	Kg	4.00	63.70	254.80	M-087/1000
		GI pipe 100mm dia	metre	6.00	442.41	2654.44	M-056
		GI bolt 10 mm Dia	each	6.00	25.22	151.32	M-110
		Galvanised MS flat clamp	each	2.00	33.63	67.26	M-101
		b) Labour					
		For fabrication					
		Mate	day	0.02	582.53	11.65	L-12
		Skilled (Blacksmith, welder etc.)	day	0.02	635.48	12.71	L-02
		Mazdoor	day	0.02	529.57	10.59	L-13
		For fixing in position					
		Mate	day	0.01	582.53	5.83	L-12
		Mason	day	0.01	635.48	6.35	L-11
		Mazdoor	day	0.20	529.57	105.91	L-13
		Add @ 5 per cent of cost of material and labour for electrodes, cutting gas, sealant, anti-corrosive bituminous paint, mild steel grating etc.				164.04	
		c) Overhead charges @ 25% on (a+b)				861.23	
		d) Contractor's profit @ 16% on (a+b+c)				688.98	
		Rate per metre (a+b+c+d)				4995.11	
					say	4995.00	
		Note 1. In case of viaducts in urban areas, the drainage spouts should be connected with suitably located pipelines to discharge the surface run-off to drains provided at ground level.					
		2. In case of bridges, sufficient length of G.I Pipe shall be provided to ensure that there is no splashing of water from the drainage spout on the structure.					
14.10	2700	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification					
		Unit = 1 cum					
		Taking output = 1 cum					
		Material					
		Concrete, Rate as per item No. 12.8 (A) excluding formworks	cum	1.00	11731.00	11731.00	Item 12.8 (A)
		Rate per cum			say	11731.00	
14.11	1500,1600,1700 & 2704	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification					
		Unit = 1 cum					
		Taking output = 1 cum					
		a) Material					
		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	7084.00	7084.00	Item 12.8 (G)
		(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.				141.68	
		HYSD bar reinforcement Rate as per item No 14.2 (Excluding OH & CP)	tonne	0.05	62657.00	3132.85	Item 14.2 A
		b) Overhead charges @ 25% on (a)				2589.63	
		c) Contractor's profit @ 16% on (a+b)				2071.71	
		Rate per cum (a+b+c)				15019.87	
					say	15020.00	
		Note The grade of reinforced cement concrete may be adopted as M30 for severe conditions and M25 for moderate conditions.					
14.12	1600	Providing anti-corrosive treatment to HYSD reinforcement with Fusion Bonded Epoxy Coating (FBEC)					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			Unit = 1 MT					
			Taking output = 1 MT					
			To be taken as per the prevailing market rates.					
		Note	Contractors generally do not have expertise for this item . The job is therefore, got done from specialised firms who have the expertise in the field of construction chemicals. The prevailing rate in the market is required to be ascertained from the market and added in the cost estimate. Detailed guidelines in this regard have been issued by MoRTH vide their circular no. RW/NH-34041/44/91-S&R dated 21.3.2000					
14.13	1800 & 2300		Precast - pretensioned Girders					
			Providing, precasting, transportation and placing in position precast pretensioned concrete girders as per drawing and technical specifications					
			Unit = 1 cum					
			Taking output = 1 cum					
			Grade of concrete - M40					
			a) Material					
			Cement	tonne	0.47	7169.28	3369.56	M-081
			Coarse sand	cum	0.45	1297.45	583.85	M-004
			20 mm Aggregate	cum	0.54	2609.72	1409.25	M-053
			10 mm Aggregate	cum	0.36	2372.05	853.94	M-051
			Admixture @ 0.4 per cent of cement	Kg	1.88	376.63	708.06	M-180
			HYSD steel .	tonne	0.10	52915.23	5291.52	M-082
			HT strand with 5 per cent as wastage and extra length for anchoring	tonne	0.06	127841.44	7670.49	M-119
			LDO for steam curing	Litre	37.00	151.73	5613.94	M-122
			Add consumables such as binding wire, foam, packing tape, shuttering oil, HDPE pipe for unbonding of strand, bolt & nuts etc @ 1 per cent of material cost				255.01	
			b) Labour					
			(i) Cutting, bending, making reinforcement cage, placing in position, binding etc. complete					
			Taking quantity of steel 100 Kg/cum of concrete including laps and wastage					
			Mate	day	0.06	582.53	34.95	L-12
			Mazdoor (Skilled)	day	0.35	688.44	240.95	L-15
			Mazdoor	day	1.40	529.57	741.40	L-13
			(ii) Cable cutting and threading in position including binding by insulation tape with HDPE pipes etc., prestressing and cutting of extra length of HT strand after de-stressing.					
			Taking quantity of HT strand 60 Kg/cum					
			Mate	day	0.02	582.53	11.65	L-12
			Mazdoor (Skilled)	day	0.14	688.44	96.38	L-15
			Mazdoor	day	0.50	529.57	264.78	L-13
			(iii) Erection and dismantling of shuttering					
			Taking shuttering area 10 sqm/cum of concrete					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mate	day	0.12	582.53	69.90	L-12
		Mazdoor (Skilled)	day	1.00	688.44	688.44	L-15
		Mazdoor	day	2.00	529.57	1059.14	L-13
		(iv) Concreting by Batching plant and stationary concrete pump					
		Mate	day	0.03	582.53	17.48	L-12
		Mazdoor (Skilled)	day	0.05	688.44	34.42	L-15
		Mazdoor	day	0.60	529.57	317.74	L-13
		(v) Steam curing and manual curing					
		Mate	day	0.01	582.53	5.83	L-12
		Mazdoor	day	0.35	529.57	185.35	L-13
		(vi) Handling of precast girder, stacking in stockyard and again loading in trailer					
		Mate	day	0.01	582.53	5.83	L-12
		Mazdoor	day	0.25	529.57	132.39	L-13
		(vii) Placement of girders in position over pier caps including placement of sand jacks, channel, levelling etc.					
		Mate	day	0.01	582.53	5.83	L-12
		Mazdoor (Skilled)	day	0.06	688.44	41.31	L-15
		Mazdoor	day	0.24	529.57	127.10	L-13
		c) Machinery					
		i) At casting yard					
		Generator 100 KVA	hour	0.05	1253.49	62.67	P&M-080
		Batching Plant @ 20 cum/hour	hour	0.05	2195.60	109.78	P&M-002
		Transit Mixer 4 cum capacity	hour	0.10	165.23	16.52	P&M-049
		Concrete Pump stationary	hour	0.05	409.89	20.49	P&M-007
		Crane 35 tonne capacity	hour	0.10	1182.00	118.20	P&M-012
		Trailer 30 tonne capacity	hour	0.10	1834.96	183.50	P&M-089
		Loader	hour	0.05	930.98	46.55	P&M-017
		ii) For transportation and placement at site					
		Crane 35 tonne capacity	hour	0.15	1182.00	177.30	P&M-012
		Trailer 30 tonne capacity for transporting to site.	tonne.km	2.5xL	174.76	4368.95	Lead =10 km & P&M-090
		(L - Lead in Kilometer)					
		Trailer 30 tonne capacity during placement.	hour	0.15	1834.96	275.24	P&M-089
		Cost of formwork, steam curing arrangement, pretensioning arrangement etc @ 5 per cent of cost material, labour and machinery				1519.71	
		d) Overhead charges @ 25% on (a+b+c)				9183.85	
		e) Contractor's profit @ 16% on (a+b+c+d)				7347.08	
		Rate per cum = (a+b+c+d+e)				53266.34	
					say	53266.00	
14.14	1700 & 1800	Providing and fixing Helical pipes in voided concrete slabs					
		Unit = 1 RM					
		Taking output = 1 RM					
		a) Material					
		Helical pipes 600mm diameter	metre	1.00	2263.14	2263.14	M-117
		Tie rods 20mm diameter	each	1.00	107.61	107.61	M-183
		Consumables for sealing joints etc.@ 5 per cent of cost of material				118.54	
		b) Labour					
		Mate	day	0.01	582.53	5.83	L-12
		Fitter	day	0.05	635.48	31.77	L-08
		Mazdoor	day	0.20	529.57	105.91	L-13
		c) Overhead charges @ 25% on (a+b)				658.20	
		d) Contractor's profit @ 16% on (a+b+c)				526.56	
		Rate per cum (a+b+c+d)				3817.56	
					say	3818.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.15	800	Crash Barriers					
		The rate analysis for rigid crash barrier in reinforced cement concrete, semi-rigid crash barrier with metal beam and flexible crash barrier with wire ropes have been made and included in chapter-8 on Traffic and Transportation.					
14.16	800	Painting on concrete surface					
		Providing and applying 2 coats of water based cement paint to unplastered concrete surface after cleaning the surface of dirt, dust, oil, grease, efflorescence and applying paint @ of 1 litre for 2 sqm.					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.01	582.53	5.83	L-12
		Painter	day	0.25	635.48	158.87	L-18
		Mazdoor (Skilled)	day	0.25	688.44	172.11	L-15
		b) Material					
		Water based paint of approved quality for cement concrete surface	Litres	5.00	353.09	1765.45	M-190
		c) Overhead charges @ 25% on (a+b)				525.57	
		d) Contractor's profit @ 16% on (a+b+c)				420.45	
		Cost for 10 sqm (a+b+c+d)				3048.28	
		Rate per sqm (a+b+c+d)/10				304.83	
					say	<u>305.00</u>	
14.17	2604	Burried Joint					
		Providing and laying a burried expansion joint, expansion gap being 20 mm, covered with 12 mm thick, 200 mm wide galvanised weldable structural steel plate as per IS: 2062, placed symmetrical to centre line of the joint, resting freely over the top surface of the deck concrete, welding of 8 mm dia. 100 mm long galvanised nails spaced 300 mm c/c along the centre line of the plate, all as specified in clause 2604.					
		Unit = Running meter					
		Taking output = 12 m					
		a) Labour					
		Mate	day	0.02	582.53	11.65	L-12
		Mazdoor	day	0.40	529.57	211.83	L-13
		Mazdoor (Skilled)	day	0.20	688.44	137.69	L-15
		b) Material					
		Galvanised M.S plate 200 mm wide, 12 mm thick @ 94.20 kg/sqm including 5 per cent wastage	kg	237.50	67.95	16137.46	M-060/1000
		Add 1 per cent of cost of steel plate cutting, welding consumables and galvanised nails.				161.37	
		c) Overhead charges @ 25% on (a+b)				4165.00	
		d) Contractor's profit @ 16% on (a+b+c)				3332.00	
		Cost for 12 m = (a+b+c+d)				24157.00	
		Rate per m = (a+b+c+d)/12				2013.08	
					say	<u>2013.00</u>	
		Note					
		Guidelines laid down vide the MoRTH circular No. RW/NH-34059/1/96-S&R dated 30.11.2000 and subsequent corrigendum dated 25.01.2001 may be referred for expansion joints.					
14.18	2605	Filler joint					
		(i) Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.					
		Unit = Running meter					
		Taking output = 12 m					
		a) Labour					
		Cutting, bending, carrying & fixing etc.					
		Mate	day	0.04	582.53	23.30	L-12

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor	day	0.50	529.57	264.78	L-13
		Mazdoor (Skilled)	day	0.50	688.44	344.22	L-15
		b) Material					
		Copper plate - 12m long x 250 mm wide	kg	55.00	1076.09	59184.73	M-086
		Area = 12 x 0.25 = 3 sqm					
		Weight = 3 x 0.002 x 8900 = 53.4 kg					
		Wastage @ 2.5 per cent = 1.33 kg/54.73 kg say = 55 kg.					
		c) Overhead charges @ 25% on (a+b)				14954.26	
		d) Contractor's profit @ 16% on (a+b+c)				11963.41	
		Cost for 12 m = (a+b+c+d)				86734.70	
		Rate per m = (a+b+c+d)/12				7227.89	
					say	7228.00	
14.18	(ii)	Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		a) Labour					
		For carrying, placing & fixing.					
		Mate	day	0.008	582.53	4.66	L-12
		Mazdoor	day	0.10	529.57	52.96	L-13
		Mazdoor (Skilled)	day	0.10	688.44	68.84	L-15
		b) Material					
		20 mm thick compressible fibre board 12 m long x 25 cm deep.	sqm	3.00	2017.66	6052.98	M-084
		Area = 12 x 0.25 = 3 sqm					
		c) Overhead charges @ 25% on (a+b)				1544.86	
		d) Contractor's profit @ 16% on (a+b+c)				1235.89	
		Cost for 12 m = (a+b+c+d)				8960.20	
		Rate per m = (a+b+c+d)/12				746.68	
					say	747.00	
14.18	(iii)	Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		a) Labour					
		Mate	day	0.01	582.53	5.83	L-12
		Mazdoor	day	0.20	529.57	105.91	L-13
		Mazdoor (Skilled)	day	0.10	688.44	68.84	L-15
		b) Material					
		Premoulded joint filler 12 m long, 20 mm thick and 300 mm deep.	sqm	3.60	503.07	1811.05	M-141
		c) Overhead charges @ 25% on (a+b)				497.91	
		d) Contractor's profit @ 16% on (a+b+c)				398.33	
		Cost for 12 m = (a+b+c+d)				2887.87	
		Rate per m = (a+b+c+d)/12				240.66	
					say	241.00	
14.18	(iv)	Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6 per cent bitumen by weight					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		12m long x 100 mm wide x 10mm deep recess					
		a) Labour					
		Mate	day	0.02	582.53	11.65	L-12
		Mazdoor	day	0.50	529.57	264.78	L-13
		Mazdoor (Skilled)	day	0.10	688.44	68.84	L-15

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Material					
		Sand	cum	0.012	6977.61	83.73	M-005
		Volume $12 \times 0.1 \times 0.01 = 0.012$ cum					
		Weight $0.012 \times 1400 = 16.8$ kg					
		Bitumen	cum	0.001	41363.28	41.36	M-074
		$16.8 \times 0.06 = 1$ kg					
		c) Overhead charges @ 25% on (a+b)				117.59	
		d) Contractor's profit @ 16% on (a+b+c)				94.07	
		Cost for 12 m = (a+b+c+d)				682.04	
		Rate per m = (a+b+c+d)/12				56.84	
					say	57.00	
		Note					
		For arriving at the final rate of filler joints per m length and per cm depth of joint filling compound, the rates at Sl. No. i), ii), iii) & iv) shall be added					
14.19	2600	Asphaltic Plug joint					
		Providing and laying of asphaltic plug joint to provide for horizontal movement of 25 mm and vertical movement of 2 mm, depth of joint varying from 75 mm to 100 mm, width varying from 500 mm to 750 mm (in traffic direction), covered with a closure plate of 200mm x 6mm of weldable structural steel conforming to IS: 2062, asphaltic plug to consist of polymer modified bitumen binder, carefully selected single size aggregate of 12.5 mm nominal size and a heat resistant foam caulking/backer rod, all as per approved drawings and specifications.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		a) Labour					
		Mate	day	0.052	582.53	30.29	L-12
		Mazdoor	day	1.00	529.57	529.57	L-13
		Mazdoor (Skilled)	day	0.30	688.44	206.53	L-15
		b) Material					
		Crushed stone aggregate 12.5 mm nominal size	cum	0.75	2145.82	1609.36	M-052
		Polymer modified bitumen	kg	77.50	42.02	3256.80	M-078/1000
	2.4	Galvanised structural steel plate 200 mm wide, 6 mm thick, 12 m long (2.4 sqm) @ 47.10 kg/sqm including 5 per cent wastage	kg	113.00	80.71	9119.83	M-103
		Add 1 per cent for welding and foam caulking/backer rod and other incidentals.				147.52	
		c) Machinery					
		Mastic cooker 1 tonne capacity	hour	1.00	536.98	536.98	P&M-030
		Smooth 3-wheeled steel roller 8-10 capacity	hour	0.50	510.51	255.25	P&M-044
		d) Overhead charges @ 25% on (a+b+c)				3923.04	
		e) Contractor's profit @ 16% on (a+b+c+d)				3138.43	
		Cost for 12 m asphalt plug joint = (a+b+c+d+e)				22753.61	
		Rate per m = (a+b+c+d+e)/12				1896.13	
					say	1896.00	
		Note					
		The nominal size of aggregates shall be 12.5 mm for depth of joint upto 75 mm and 20 mm for joints of depth more than 75 mm.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.20	2606	Elastomeric Slab Steel Expansion Joint					
		Providing and laying of an elastomeric slab steel expansion joint, catering to right or skew (less than 20 deg., moderately curved with maximum horizontal movement upto 50 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 and clause 2606 of MoRTH specifications for road & bridge works.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		a) Labour					
		Mate	day	0.06	582.53	34.95	L-12
		Mazdoor	day	1.00	529.57	529.57	L-13
		Mazdoor (Skilled)	day	0.50	688.44	344.22	L-15
		b) Material					
		Supply of elastomeric slab seal expansion joint assembly manufactured by using chloroprene, elastomer for elastomeric slab unit conforming to clause 915.1 of IRC: 83 (part II), complete as per approved drawings and standard specification conforming to clause 2606 of MoRTH Specification	metre	12.00	15314.05	183768.59	M-093
		Add 5 per cent of cost of material for anchorage reinforcement, welding and other incidentals.				9188.43	
		c) Overhead charges @ 25% on (a+b)				48466.44	
		d) Contractor's profit @ 16% on (a+b+c)				38773.15	
		Cost for 12 m = (a+b+c+d)				281105.35	
		Rate per m = (a+b+c+d)/12				23425.45	
					say	23425.00	
14.21	2600	Compression Seal Joint					
		Providing and laying of compression seal joint consisting of steel armoured nosing at two edges of the joint gap suitably anchored to the deck concrete and a preformed chloroprene elastomer or closed cell foam joint sealer compressed and fixed into the joint gap with special adhesive binder to cater for a horizontal movement upto 40 mm and vertical movement of 3 mm.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		a) Labour					
		Mate	day	0.036	582.53	20.97	L-12
		Mazdoor	day	0.60	529.57	317.74	L-13
		Mazdoor (Skilled)	day	0.30	688.44	206.53	L-15
		b) Material					
		1. Galvanised angle sections 100mm x 100mm of 12mm thickness weldable structural steel as per IS: 2062, 2 nos. of 12 m length each @ 17.7 kg/m and 5 per cent wastage.	kg	446.00	80.71	35995.08	M-103
		Add 5 per cent of cost of above for structural steel for anchorage, welding and other incidentals.				1827.02	
		Preformed continuous chloroprene elastomer or closed cell foam sealing element with high tear strength, vulcanised in a single operation for the full length of a joint to ensure water tightness.	metre	12.00	587.81	7053.74	M-143
		Add 1 per cent of cost of sealing element for lubricant-cum-adhesive and other consumables.				70.54	
		c) Overhead charges @ 25% on (a+b)				11372.91	
		d) Contractor's profit @ 16% on (a+b+c)				9098.32	
		Cost for 12 m = (a+b+c+d)				65962.85	
		Rate per m = (a+b+c+d)/12				5496.90	
					say	5497.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Note					
		1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
		3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.					
14.22	2607	Strip Seal Expansion Joint					
		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.					
		Unit = Running meter					
		Taking output = 12 m					
		a) Labour					
		Mate	day	0.05	582.53	29.13	L-12
		Mazdoor	day	1.00	529.57	529.57	L-13
		Mazdoor (Skilled)	day	0.25	688.44	172.11	L-15
		b) Material					
		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	28.25	338.97	M-178
		Add 5 per cent of cost of material for anchorage reinforcement, welding and other incidentals.				53.49	
		c) Overhead charges @ 25% on (a+b)				280.82	
		d) Contractor's profit @ 16% on (a+b+c)				224.65	
		Cost for 12 m = (a+b+c+d)				1628.73	
		Rate per m = (a+b+c+d)/12				135.73	
					say	136.00	
		Note					
		1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
14.23	2600	Modular Strip / Box Seal Joint					
		Providing and laying of a modular strip Box seal expansion joint including anchorage catering to a horizontal movement beyond 70 mm and upto 140mm, 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.					
		Unit = Running meter					
		Taking output = 12 m					
		a) Labour					
		Mate	day	0.056	582.53	32.62	L-12
		Mazdoor	day	1.00	529.57	529.57	L-13
		Mazdoor (Skilled)	day	0.40	688.44	275.38	L-15
		b) Material					
		Supply of a modular strip/box seal joint assembly comprising of edge beams, central beam, 2 modules chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative.	metre	12.00	769.74	9236.85	M-127
		c) Overhead charges @ 25% on (a+b)				2518.61	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Contractor's profit @ 16% on (a+b+c)				2014.88	
		Cost for 12 m Modular strip/box seal joint = (a+b+c+d)				14607.91	
		Rate per m = (a+b+c+d)/12				1217.33	
					say	1217.00	
		Note 1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
		3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.					
14.24	2600	Modular Strip / Box Seal Joint					
		Providing and laying of a modular strip box seal expansion joint catering to a horizontal movement beyond 140mm and upto 210mm, 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.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		a) Labour					
		Mate	day	0.07	582.53	40.78	L-12
		Mazdoor	day	1.25	529.57	661.96	L-13
		Mazdoor (Skilled)	day	0.50	688.44	344.22	L-15
		b) Material					
		Supply of a modular box/box seal joint assembly containing 3 modules/cells and comprising of edge beams, two central beams, chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised	metre	12.00	999.95	11999.44	M-128
		c) Overhead charges @ 25% on (a+b)				3261.60	
		d) Contractor's profit @ 16% on (a+b+c)				2609.28	
		Cost for 12 m Modular strip/box seal joint = (a+b+c+d)				18917.27	
		Rate per m = (a+b+c+d)/12				1576.44	
					say	1576.00	
		Note 1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
		3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.					

CHAPTER - 15								
RIVER TRAINING AND PROTECTION WORKS								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
15.1	2503		Providing and laying boulders apron on river bed for protection against scour with stone boulders weighing not less than 40 kg each complete as per drawing and Technical specification.					
		A	Boulder Laid Dry Without Wire Crates.					
			Unit = cum					
			Taking output = 1 cum					
		a)	Material					
			Stone	cum	1.00	1297.45	1297.45	M-003
			Stone Spalls	cum	0.20	2947.06	589.41	M-008
		b)	Labour					
			Mate	day	0.04	582.53	23.30	L-12
			Mason	day	0.35	635.48	222.42	L-11
			Mazdoor *	day	0.75	529.57	397.18	L-13
		c)	Overhead charges @ 25% on (a+b)				632.44	
		d)	Contractor's profit @ 16% on (a+b+c)				505.95	
			Rate per cum = (a+b+c+d)				3668.15	
						say	3668.00	
		*	Including excavation for trimming for preparation of bed.					
		Note	Nominal excavation required for preparation of bed has been taken into account while making provision for labour.					
15.2	2503		Boulder Apron Laid in Wire Crates					
			Providing and laying of boulder apron laid in wire crates made with 4mm dia GI wire conforming to IS: 280 & IS:4826 in 100mm x 100mm mesh (weaved diagonally) including 10 per cent extra for laps and joints laid with stone boulders weighing not less than 40 kg each.					
			Unit = cum					
			Taking output = 3 mx1.5mx1.25m = 5.63 cum					
		a)	Material					
			4mm GI wire crates woven in mesh size of 100 mm x 100 mm.	sqm	22.00	470.79	10357.33	M-102
			Stone	cum	5.63	1297.45	7304.62	M-003
			Stone Spalls	cum	1.13	2947.06	3330.17	M-008
		b)	Labour					
			Mate	day	0.18	582.53	104.85	L-12
			Mazdoor (Skilled)	day	1.50	688.44	1032.66	L-15
			Mazdoor	day	*3.00	529.57	1588.7	L-13
		c)	Overhead charges @ 25% on (a+b)				5929.6	
		d)	Contractor's profit @ 16% on (a+b+c)				4743.67	
			Cost for 5.63 cum = a+b+c+d				34391.61	
			Rate per cum = (a+b+c+d)/5.63				6108.63	
						say	6109.00	
		*	Including excavation for trimming for preparation of bed.					
		Note	Readymade woven wire crate rolls have been considered in the rate analysis. In case readymade rolls are not available, GI wire 4mm dia. @ 32 kg per 10 sqm may be provided. In that case 2 per cent of the cost of GI wire may be added for weaving the wire crates.					
15.3	2503		Cement Concrete Blocks (size 0.5 x 0.5 x 0.5 m)					
			Providing and laying of apron with cement concrete blocks of size 0.5x0.5x0.5 m cast in-situ and made with nominal mix of M-15 grade cement concrete with a minimum cement content of 250 kg/cum as per IRC: 21-2000.					
			Unit = cum					
			Taking out put = 1 cum					
			Concrete Grade M15 Rate as per item No. 12.8 (A) including OH & CP	cum	1.00	12200.00	12200.00	Item 12.8 (A)
			Add 2 per cent of cost to account for excavation for preparation of bed, nominal surface reinforcement and filling of granular material in recesses between blocks.				244.00	
			Rate per cum				12444.00	
						say	12444.00	
15.4	2504		Providing and laying Pitching on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical specifications					
		A	Stone/Boulder					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Stone weighing not less than 40kg	cum	1.00	1297.45	1297.45	M-003
		Stone spalls of minimum 25 mm size	cum	0.20	2947.06	589.41	M-008
		b) Labour					
		Mate	day	0.04	582.53	23.30	L-12
		Mason	day	0.35	635.48	222.42	L-11
		Mazdoor	day	0.75	529.57	397.18	L-13
		c) Overhead charges @ 25% on (a+b)				632.44	
		d) Contractor's profit @ 16% on (a+b+c)				505.95	
		Rate per cum = (a+b+c+d)				3668.15	
					say	3668.00	
15.4	B	Cement Concrete Blocks of size 0.3x0.3 x0.3 m cast in cement concrete of Grade M15					
		Unit = cum					
		Taking output = 1 cum					
		Concrete Grade M15 Rate as per item No. 12.8 (A)	cum	1.00	12200.00	12200.00	Item 12.8 (A)
		Add 2 per cent of cost to account for nominal surface reinforcement and filling of granular material in recesses between blocks.				244.00	
		Rate per cum				12444.00	
					say	12444.00	
15.5	2504	Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Graded stone aggregate of required size	cum	1.20	1919.16	2302.99	M-012
		b) Labour					
		Mate	day	0.05	582.53	29.13	L-12
		Mazdoor (Skilled)	day	0.25	688.44	172.11	L-15
		Mazdoor *	day	1.00	529.57	529.57	L-13
		c) Overhead charges @ 25% on (a+b)				758.45	
		d) Contractor's profit @ 16% on (a+b+c)				606.76	
		Rate per cum = (a+b+c+d)				4399.01	
					say	4399.00	
		Includes Mazdoor required for trimming of slope to proper profile and preparation of bed.					
15.6	700 & 2504	Geotextile Filter					
		Laying of a geotextile filter between pitching and embankment slopes on which pitching is laid to prevent escape of the embankment material through the voids of the stone pitching/cement concrete blocks as well as to allow free movement of water without creating any uplift head on the pitching.					
		Unit = sqm					
		Taking output = 10 sqm.					
		a) Labour					
		Mate	day	0.02	582.53	11.65	L-12
		Mazdoor	day	0.30	529.57	158.87	L-13
		Mazdoor (Skilled)	day	0.10	688.44	68.84	L-15

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Material					
		Permeable synthetic geotextile including 5 per cent for overlap and wastage	sqm	11.00	511.14	5622.55	M-181
		c) Overhead charges @ 25% on (a+b)				1465.48	
		d) Contractor's profit @ 16% on (a+b+c)				1172.38	
		Cost for 10 sqm = a+b+c+d				8499.78	
		Rate per sqm = (a+b+c+d)/10				849.98	
					say	850.00	
15.7	2504.4	Toe protection					
		A toe wall for toe protection can either be in dry rubble masonry in case of dry rubble pitching or pitching with stones in wire crates or it can be in PCC M15 nominal mix if cement concert block have been used for pitching . Rates for toe wall can be adopted from respective clauses depending upon approved design. The rate for excavation for foundation, dry rubble masonry and PCC M15 have been analysed and given in respective chapters.					
15.8	2505	Providing and laying Flooring complete as per drawing and Technical specifications laid over cement concert bedding.					
		A Rubble stone laid in cement mortar 1:3					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Cement mortar 1:3 (Rate as in Item 12.6 sub-analysis) excluding OH & CP	cum	0.33	11830.00	3903.90	Item 12.6 (A)
		b) Add for cement concrete bedding (M15 Nominal mix) vide Item 12.8 (A) excluding OH & CP . Quantity shall be adopted as per design (Assume Rubble stone Flooring thickness 300mm and cement concrete bedding thickness 100mm)	cum	0.33	12200.00	4026.00	Item 12.8 (A)
		Add 1 per cent of cost to account for excavation for preparation of bed.				79.30	
		c) Material					
		Stone	cum	1.00	1081.65	1081.65	M-003
		Stone Spalls	cum	0.20	1378.81	275.76	M-008
		d) Labour					
		Mate	day	0.08	582.53	46.60	L-12
		Mason	day	0.50	635.48	317.74	L-11
		Mazdoor (for laying stones, filling of quarry spalls)	day	1.50	529.57	794.35	L-13
		e) Overhead charges @ 25% on (a+c+d)				1605.00	
		f) Contractor's profit @ 16% on (a+c+d+e)				1284.00	
		Rate per cum = (a+b+c+d+e+f)				13414.31	
					say	13414.00	
		* Includes cement mortar for laying and filling of joints.					
15.8		B Cement Concrete blocks Grade M15					
		Concrete Grade M15 block. (Rate as per item No. 12.8 (A) including OH & CP.	cum	1.00	12200.00	12200.00	Item 12.8 (A)
		Add for cement concrete bedding (M15 Nominal mix) vide Item 12.8 (A) including OH & CP. Quantity shall be adopted as per design (Assume Cement Concrete blocks thickness 300mm and cement concrete bedding thickness 100mm)	cum	0.33	12200.00	4026.00	Item 12.8 (A)
		Add 1 per cent of cost to account for excavation for preparation of bed.				162.26	
		Rate per cum				16388.26	
					say	16388.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
15.9	2506		Dry Rubble Flooring					
			Construction of dry rubble flooring at cross drainage works for relatively less important works.					
			Unit = cum					
			Taking output = 1 cum					
			a) Material					
			Stone	cum	1.00	1081.65	1081.65	M-003
			Stone Spalls	cum	0.20	1378.81	275.76	M-008
			b) Labour					
			Mate	day	0.10	582.53	58.25	L-12
			Mason	day	0.50	635.48	317.74	L-11
			mazdoor	day	1.50	529.57	794.35	L-13
			Add 1 per cent of (b) for trimming and preparation of base.				11.70	
			c) Overhead charges @ 25% on (a+b)				634.87	
			d) Contractor's profit @ 16% on (a+b+c)				507.89	
			Rate per cum = (a+b+c+d)				3682.22	
						say	3682.00	
15.10	2507.2		Curtain wall complete as per drawing and Technical specification					
		A	Stone masonry in cement mortar (1:3)					
			Coursed rubble masonry (1st sort)	cum	1.00	11595.00	11595.00	Item 12.7 (A)
			Rate same as per item No. 12.7 (A) including OH & CP					
			Rate per cum			say	11595.00	
			or					
15.10		B	Cement concrete Grade M15					
			Concrete Grade M15 Rate as per item No. 12.8 (A) including OH & CP	cum	1.00	12200.00	12200.00	Item 12.8 (A)
			Rate per cum			say	12200.00	
		Note	Other items like excavation for foundation, filling behind wall, filter media, weep holes etc. shall be added separately as per approved design.					
15.11	2507.2		Flexible Apron :Construction of flexible apron 1 m thick comprising of loose stone boulders weighing not less than 40 kg beyond curtain wall.					
			Unit = cum					
			Taking Output = 1 cum					
			a) Material					
			Stone	cum	1.00	1081.65	1081.65	M-003
			Stone Spalls	cum	0.20	1378.81	275.76	M-008
			b) Labour					
			Mate	day	0.05	582.53	29.13	L-12
			Mason	day	0.25	635.48	158.87	L-11
			Mazdoor	day	1.00	529.57	529.57	L-13
			Add 1 per cent of cost of (a+b) for trimming and preparation of bed.				20.75	
			c) Overhead charges @ 25% on (a+b)				523.93	
			d) Contractor's profit @ 16% on (a+b+c)				419.15	
			Rate per cum = (a+b+c+d)				3038.80	
						say	3039.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
15.12	2503.3		Gabian Structure for Retaining Earth					
			Providing and construction of a gabian structure for retaining earth with segments of wire crates of size 7 m x 3 m x 0.6 m each divided into 1.5 m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be tied with 4 mm galvanised steel wire					
			Unit = cum					
			Taking output = 7 x 3 x 0.6 = 12.60 cum					
			a) Labour					
			Mate	day	0.28	582.53	163.11	L-12
			Mazdoor	day	5.00	529.57	2647.85	L-13
			Mazdoor (Skilled)	day	2.00	688.44	1376.88	L-15
			b) Material					
			Galvanised steel wire crates of mesh size 100 mm x 100 mm woven with 4mm dia. GI wire in rolls of required size.	sqm	61.00	470.79	28718.05	M-102
			Stone boulders with least dimension of 200 mm	cum	12.60	1297.45	16347.82	M-003
			Stone spalls of minimum size 25 mm	cum	2.52	2947.06	7426.58	M-008
			c) Overhead charges @ 25% on (a+b)				14170.07	
			d) Contractor's profit @ 16% on (a+b+c)				11336.06	
			Cost for 12.60 cum (a+b+c+d)				82186.42	
			Rate per cum (a+b+c+d)/12.60				6522.73	
						say	6523.00	
		Note	Readymade woven wire crate rolls have been considered in the rate analysis. In case readymade rolls are not available, GI wire 4mm dia. @ 32 kg per 10 sqm may be provided. In that case 2 per cent of the cost of GI wire may be added for weaving the wire crates.					
15.13	2503.3		Gabian Structure for Erosion Control, River Training Works and Protection works					
			Providing and constructing gabian structures for erosion control, river training works and protection works with wire crates of size 2 m x 1 m x 0.3 m each divided into 1m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 mm x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be securely tied with 4 mm galvanised steel wire					
			Unit = cum					
			Taking output = 2 x 1 x 0.3 x 10 Nos. = 6.00 cum					
			a) Labour					
			Mate	day	0.14	582.53	81.55	L-12
			Mazdoor	day	2.50	529.57	1323.92	L-13
			Mazdoor (Skilled)	day	1.00	688.44	688.44	L-15
			b) Material					
			Galvanised steel wire crates of mesh size 100 mm x 100 mm woven with 4mm dia. GI wire in rolls of required size to cover 6.00 cum.	sqm	65.00	470.79	30601.20	M-102
			Stone boulders with least dimension of 200 mm	cum	6.00	1297.45	7784.68	M-003
			Stone spalls of minimum size 25 mm	cum	1.20	2947.06	3536.47	M-008

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			c) Overhead charges @ 25% on (a+b)				11004.07	
			d) Contractor's profit @ 16% on (a+b+c)				8803.25	
			Cost for 6.00 cum (a+b+c+d)				63823.58	
			Rate per cum (a+b+c+d)/6.00				10637.26	
						say	<u>10637.00</u>	
		Note	Readymade woven wire crate rolls have been considered in the rate analysis. In case readymade rolls are not available, GI wire 4mm dia. @ 32 kg per 10 sqm may be provided. In that case 2 per cent of the cost of GI wire may be added for weaving the wire crates.					

CHAPTER-16								
REPAIR AND REHABILITATION								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
16.1	2809		Removal of existing cement concrete wearing coat including its disposal complete as per Technical Specification without causing any detrimental effect to any part of the bridge structure and removal of dismantled material with all lifts and lead upto 1000 m					
			<i>Unit = Sq m (Thickness 75 mm)</i>					
			<i>Taking output = 10 sqm</i>					
			a) Labour					
			Mate	day	0.06	582.53	34.95	L-12
			Mazdoor	day	1.00	529.57	529.57	L-13
			b) Machinery					
			Air Compressor 250 cfm with pneumatic breaker/jack hammer along with accessories.	hour	1.00	887.56	887.56	P&M-001
			Tractor-trolley.	hour	0.50	357.99	178.99	P&M-053
			c) Overhead charges @ 30% on (a+b)				489.32	
			d) Contractor's profit @ 16% on (a+b+c)				339.26	
			Cost for 10 sqm = (a+d+c+d)				2459.66	
			Rate per sqm = (a+b+c+d)/10				245.97	
						say	246.00	
16.2	2809		Removal of existing asphaltic wearing coat comprising of 50 mm thick asphaltic concert laid over 12 mm thick mastic asphalt including disposal with all lift and lead upto 1000 m.					
			<i>Unit = Sq m</i>					
			<i>Taking output = 10 sqm</i>					
			a) Labour					
			Mate	day	0.03	582.53	17.48	L-12
			Mazdoor	day	0.75	529.57	397.18	L-13
			b) Machinery					
			Air Compressor 250 cfm with pneumatic breaker.	hour	0.75	887.56	665.67	P&M-001
			Tractor-trolley.	hour	0.40	357.99	143.20	P&M-053
			c) Overhead charges @ 30% on (a+b)				367.06	
			d) Contractor's profit @ 16% on (a+b+c)				254.49	
			Cost for 10 sqm = (a+d+c+d)				1845.07	
			Rate per sqm = (a+b+c+d)/10				184.51	
						say	185.00	
16.3	2807		Guniting concrete surface with cement mortar applied with compressor after cleaning surface and spraying with epoxy complete as per Technical Specification					
			<i>Unit = Sq m</i>					
			<i>Taking output = 1 sqm</i>					
			Assuming thickness 25 mm					
			a) Material					
			Cement	kg	16.00	7.17	114.71	M-081/1000
			Graded sand	cum	0.04	7753.27	310.13	M-005
			Wire mesh 50mm x 50mm size of 3mm wire	kg	2.00	96.85	193.70	M-192
			Epoxy	kg	0.67	742.50	497.47	M-095
			Accelerator compound for guniting @ 4 per cent of weight of cement	kg	0.64	376.63	241.04	M-180
			Add 2 per cent of cost of material for miscellaneous consumables like nozzles, wire brush, cotton waste				27.14	
			b) Labour					
			Mate	day	0.01	582.53	5.83	L-12
			Mason	day	0.04	635.48	25.42	L-11
			Mazdoor	day	0.14	529.57	74.14	L-13
			c) Machinery					
			Compressor with guniting equipment along with accessories	hour	0.10	1254.45	125.44	P&M-076
			d) Overhead charges @ 30% on (a+b+c)				484.51	
			e) Contractor's profit @ 16% on (a+b+c+d)				335.92	
			Rate per sqm = (a+b+c+d+e)				2435.45	
						say	2435.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
16.4	2800		Providing and inserting nipples with approved fixing compound after drilling holes for grouting as per Technical Specifications including subsequent cutting/removal and sealing of the hole as necessary of nipples after completion of grouting with Cement/Epoxy					
			<i>Unit = Number</i>					
			<i>Taking output = 1 No.</i>					
			a) Material					
			Nipples	each	1.00	12.11	12.11	M-129
			Cement, fixing compound and consumables @ 15 per cent of cost of nipple				1.82	
			b) Labour					
			Mate	day	0.01	582.53	5.83	L-12
			Mazdoor (Skilled) labour for drilling	day	0.08	688.44	55.08	L-15
			Mazdoor (Skilled) labour for fixing nipple and sealing inlets	day	0.08	688.44	55.08	L-15
			Mazdoor for cutting and removing of nipples	day	0.04	529.57	21.18	L-13
			Add 10 per cent of labour cost for drilling holes etc				13.72	
			c) Overhead charges @ 30% on (a+b)				49.44	
			d) Contractor's profit @ 16% on (a+b+c)				34.28	
			Rate per No. = (a+b+c+d)				248.51	
						say	249.00	
16.5	2806		Sealing of cracks/porous concrete by injection process through nipples/Grouting complete as per Technical Specification.					
		A	Cement Grout					
			<i>Unit = kg</i>					
			<i>Taking output = 1 kg</i>					
			a) Material					
			Cement including 10 per cent wastage	kg	1.10	7.17	7.89	M-081/1000
			Admixtures (anti shrinkage compound) @ 20 per cent of cost of cement				1.58	
			b) Labour					
			Mate	day	0.08	582.53	46.60	L-12
			Mazdoor (Skilled)	day	0.10	688.44	68.84	L-15
			Mazdoor	day	0.10	529.57	52.96	L-13
			c) Machinery					
			Grout pump with agitator and accessories	hour	0.10	457.34	45.73	M-111
			d) Overhead charges @ 30% on (a+b+c)				67.08	
			e) Contractor's profit @ 16% on (a+b+c+d)				46.51	
			Rate per kg = (a+b+c+d+e)				159.32	
						say	159.00	
		B	Cement Mortar (1:1) Grouting					
			<i>Unit = kg</i>					
			<i>Taking output = 1 kg</i>					
			a) Material					
			Cement including 10 per cent wastage	kg	0.55	7.17	3.94	M-081/1000
			Sand including 10 per cent wastage	kg	0.55	4.65	2.56	M-005/1500
			Admixtures (anti shrinkage compound) @ 20 per cent of cost of cement				0.79	
			b) Labour					
			Mate	day	0.08	582.53	46.60	L-12
			Mazdoor (Skilled)	day	0.10	688.44	68.84	L-15
			Mazdoor	day	0.10	529.57	52.96	L-13
			c) Machinery					
			Grout pump with agitator and accessories	hour	0.10	457.34	45.73	M-111
			d) Overhead charges @ 30% on (a+b+c)				66.43	
			e) Contractor's profit @ 16% on (a+b+c+d)				46.06	
			Rate per kg = (a+b+c+d+e)				333.91	
						say	334.00	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
16.6	2800		Patching of damaged concrete surface with polymer concrete and curing compounds, initiator and promoter, available in present formulations, to be applied as per instructions of manufacturer and as approved by the Engineer.					
			Unit = sqm					
			Taking output = 10 sqm for an average thickness of 25mm.					
			a) Labour					
			Mate	day	0.06	582.53	34.95	L-12
			Mazdoor (Skilled)	day	0.75	688.44	516.33	L-15
			Mazdoor	day	0.75	529.57	397.18	L-13
			b) Material					
			Pre-packed polymer concrete based on epoxy system complete with curing compound, initiator and promoter including 5 per cent wastage.	kg	315.00	100.88	31778.17	M-145
			c) Machinery					
			Grout pump with agitator and accessories	hour	2.00	457.34	914.67	M-111
			d) Overhead charges @ 30% on (a+b+c)				10092.39	
			e) Contractor's profit @ 16% on (a+b+c+d)				6997.39	
			Cost for 10 sqm = a+b+c+d+e				50731.08	
			Rate per sqm = (a+b+c+d+e)/10				5073.11	
						say	5073.00	
		Note	This item is a proprietary item available in market as pre-packed polymer concrete and is required to be applied as per instructions of the manufacturer.					
16.7	2803		Sealing of crack / porous concrete with Epoxy Grout by injection through nipples complete as per clause 2803.1.					
			Unit = kg					
			Taking output = 1 kg					
			a) Material					
			Epoxy including 10 per cent wastage	kg	1.10	742.50	816.75	M-095
			b) Labour					
			Mate	day	0.08	582.53	46.60	L-12
			Mazdoor (Skilled)	day	0.10	688.44	68.84	L-15
			Mazdoor	day	0.10	529.57	52.96	L-13
			c) Machinery					
			Epoxy Injection gun	hour	0.10	287.03	28.70	P&M-078
			d) Overhead charges @ 30% on (a+b+c)				304.16	
			e) Contractor's profit @ 16% on (a+b+c+d)				210.88	
			Rate per kg = (a+b+c+d+e)				1528.89	
						say	1529.00	
16.8	2804		Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per Technical Specification					
			Unit = sqm					
			Taking output = 10 sqm					
			Assume average 10mm thickness of epoxy mortar					
			a) Material					
			Epoxy resin-hardener mix for prime coat	kg	2.50	456.64	1141.59	M-098
			Epoxy mortar	kg	2.20	657.49	1446.47	M-096
			Epoxy resin -hardener mix for seal coat.	kg	2.00	456.64	913.27	M-098
			Add 3 per cent cost of material for other consumables like acetone etc and to cover wastage.				105.04	
			b) Labour					
			Mate	day	0.04	582.53	23.30	L-12
			Mazdoor (Skilled)	day	0.50	688.44	344.22	L-15
			Mazdoor	day	0.50	529.57	264.78	L-13
			c) Overhead charges @ 30% on (a+b)				1271.61	
			d) Contractor's profit @ 16% on (a+b+c)				881.65	
			Cost for 10 sqm = a+b+c+d				6391.94	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per sqm = (a+b+c+d)/10				639.19	
					say	<u>639.00</u>	
16.9	2807	Removal of defective concrete, cleaning the surface thoroughly, applying the shotcrete mixture mechanically with compressed air under pressure, comprising of cement, sand, coarse aggregates, water and quick setting compound in the proportion as per clause 2807.1., sand and coarse aggregates conforming to IS: 383 and table 1 of IS: 9012 respectively, water cement ratio ranging from 0.35 to 0.50, density of gunite not less than 2000 kg/cum, strength not less than 25 Mpa and workmanship conforming to clause 2807.6.					
		unit: sqm					
		Taking output = 10 sqm, 40 mm average thickness.					
		a) Labour					
		Mate	day	0.04	582.53	23.30	L-12
		Mazdoor	day	0.50	529.57	264.78	L-13
		Mazdoor (Skilled)	day	0.50	688.44	344.22	L-15
		b) Machinery					
		Air compressor 250 cfm	hour	1.00	887.56	887.56	P&M-001
		Shotcreteing equipment	hour	1.00	1254.45	1254.45	P&M-076
		water tanker 6 KL capacity	hour	0.02	819.77	16.40	P&M-060
		c) Material					
		Cement	kg	120.00	7.17	860.31	M-081/1000
		Sand	cum	0.15	6977.61	1046.64	M-005
		Coarse aggregate of size 4.75mm	cum	0.15	1846.08	276.91	M-024
		Quick setting compound	kg	2.50	83.93	209.84	M-147
		Water	KL	0.10	529.57	52.96	M-189
		d) Overhead charges @ 30% on (a+b+c)				1571.21	
		e) Contractor's profit @ 16% on (a+b+c+d)				1089.37	
		Cost for 10 sqm = a+b+c+d+e				7897.95	
		Rate per sqm = (a+b+c+d+e)/10				789.80	
					say	<u>790.00</u>	
16.10	2800	Applying pre-packed cement based polymer mortar of strength 45 Mpa at 28 days for replacement of spalled concrete					
		Unit = sqm					
		Taking output = 10 sqm					
		Assumed thickness - 10 mm					
		a) Material					
		Acrylic polymer bonding coat	Litre	1.40	510.47	714.66	M-057
		pre-packed cement based polymer mortar of strength 45 Mpa at 28 days	kg	12.00	100.88	1210.60	M-145
		Add 3 per cent of (a) above for wastage.				57.76	
		b) Labour					
		Mate	day	0.04	582.53	23.30	L-12
		Mazdoor (Skilled)	day	0.50	688.44	344.22	L-15
		Mazdoor	day	0.50	529.57	264.78	L-13
		c) Overhead charges @ 30% on (a+b)				784.59	
		d) Contractor's profit @ 16% on (a+b+c)				543.99	
		Cost for 10 sqm = a+b+c+d				3943.90	
		Rate per sqm = (a+b+c+d)/10				394.39	
					say	<u>394.00</u>	
16.11	2805	Epoxy bonding of new concrete to old concrete					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Material					
		Epoxy resin with pot life not less than 60-90 minutes and satisfying testing as per clause 2803.9	kg	8.00	456.64	3653.10	M-098
		Add 3 per cent of (a) above for wastage.				109.59	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Labour					
		Mate	day	0.04	582.53	23.30	L-12
		Mazdoor (Skilled)	day	0.50	688.44	344.22	L-15
		Mazdoor	day	0.50	529.57	264.78	L-13
		c) Overhead charges @ 30% on (a+b)				1318.50	
		d) Contractor's profit @ 16% on (a+b+c)				914.16	
		Cost for 10 sqm = a+b+c+d				6627.65	
		Rate per sqm = (a+b+c+d)/10				662.77	
					say	663.00	
16.12	2810	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical Specification					
		Span assumed: 25 m					
		No. of cables: 4 no.					
		No. of anchorages : 8 no.					
		Unit = MT					
		Taking output = 1 MT					
		Assume 12.7mm dia. Strand in 12T13 system. Weight-9.42 kg/m of cable.					
		a) Material					
		HTS strand including 5 per cent wastage and extra length for jacking	tonne	1.05	127841.44	134233.51	M-119
		HDPE pipes 75mm dia including 5 per cent wastage	metre	112.00	833.97	93404.27	M-114
		Cement for grouting	kg	400.00	7.17	2867.71	M-081/1000
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	8.00	758.64	6069.13	M-187
		Epoxy	kg	6.00	742.50	4455.00	M-095
		MS plates for deviator (where deviator blocks are not provided)	tonne	2.10	60667.13	127400.97	M-179
		Add 20 per cent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.				73686.12	
		b) Labour					
		i) For making holes in the structure .					
		Mate	day	0.24	582.53	139.81	L-12
		Mazdoor Semi-skilled)	day	3.00	582.53	1747.58	L-14
		Mazdoor	day	3.00	529.57	1588.71	L-13
		ii) For making and fixing anchorages for cables and placement of cables .					
		Mate	day	0.44	582.53	256.31	L-12
		Blacksmith	day	3.00	635.48	1906.45	L-02
		Mazdoor	day	8.00	529.57	4236.56	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		iii) For prestressing					
		Mate/Supervisor	day	0.13	582.53	75.73	L-12
		Fitter	day	0.70	635.48	444.84	L-08
		Mazdoor	day	2.65	529.57	1403.36	L-13
		iv) For grouting					
		Mate/Supervisor	day	0.13	582.53	75.73	L-12
		Mason	day	0.70	635.48	444.84	L-11
		Mazdoor	day	2.65	529.57	1403.36	L-13
		c) Machinery					
		Stressing jack with pump	hour	4.00	131.33	525.33	P&M-040
		Grouting pump with agitator	hour	1.35	457.34	617.40	M-111
		d) Overhead charges @ 30% on (a+b+c)				137094.81	
		e) Contractor's profit @ 16% on (a+b+c+d)				95052.40	
		Rate per MT = (a+b+c+d+e)				689129.93	
					say	689130.00	
16.13	2810	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical Specification					
		Span assumed: 50 m					
		No. of cables: 4 no.					
		No. of anchorages : 8 no.					
		Unit = MT					
		Taking output = 3.10 MT					
		Assume 12.7mm dia. Strand in 19T13 system. Weight-14.73 kg/m of cable.					
		a) Material					
		HTS strand including 5 per cent wastage and extra length for jacking	tonne	3.10	127841.44	396308.47	M-119
		HDPE pipes 90mm dia including 5 per cent wastage	metre	224.00	1143.34	256108.47	M-115
		Cement for grouting	tonne	1.01	7169.28	7240.97	M-081
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	8.00	758.64	6069.13	M-187
		Epoxy	kg	10.00	742.50	7424.99	M-095
		MS plates for deviator (where deviator blocks are not provided)	tonne	7.00	60667.13	424669.91	M-179
		Add 20 per cent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.				219564.39	
		b) Labour					
		i) For making holes in the structure .					
		Mate	day	0.08	582.53	46.60	L-12
		Mazdoor Semi-skilled)	day	8.00	582.53	4660.22	L-14
		Mazdoor	day	8.00	529.57	4236.56	L-13
		ii) For making and fixing anchorages for cables and placement of cables .					
		Mate	day	1.28	582.53	745.63	L-12
		Blacksmith	day	7.00	635.48	4448.39	L-02
		Mazdoor	day	25.00	529.57	13239.25	L-13
		iii) For prestressing					
		Mate/Supervisor	day	0.20	582.53	116.51	L-12
		Fitter	day	1.00	635.48	635.48	L-08
		Mazdoor	day	4.00	529.57	2118.28	L-13
		iv) For grouting					
		Mate/Supervisor	day	0.26	582.53	151.46	L-12
		Mason	day	1.50	635.48	953.23	L-11
		Mazdoor	day	5.00	529.57	2647.85	L-13
		c) Machinery					
		Stressing jack with pump	hour	7.00	131.33	919.33	P&M-040
		Grouting pump with agitator	hour	3.00	457.34	1372.01	M-111
		d) Overhead charges @ 30% on (a+b+c)				406103.13	
		e) Contractor's profit @ 16% on (a+b+c+d)				281564.84	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 3.10 MT = a+b+c+d+e				2041345.09	
		Rate per MT = (a+b+c+d+e)/3.10				658498.42	
					say	658498.00	
16.14	2810	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical Specification					
		Span assumed: 100 m					
		No. of cables: 6 no.					
		No. of anchorages : 12 no.					
		Unit = MT					
		Taking output = 9.28 MT					
		Assume 12.7mm dia. Strand in 19T13 system. Weight-14.73 kg/m of cable.					
		a) Material					
		HTS strand including 5 per cent wastage and extra length for jacking	tonne	9.28	127841.44	1186368.57	M-119
		HDPE pipes 90 mm dia including 5 per cent wastage	metre	672.00	1143.34	768325.42	M-115
		Cement for grouting	tonne	3.04	7169.28	21794.61	M-081
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	12.00	758.64	9103.69	M-187
		Epoxy	kg	14.00	742.50	10394.99	M-095
		MS plates for deviator (where deviator blocks are not provided)	tonne	20.00	60667.13	1213342.59	M-179
		Add 20 per cent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.				641865.97	
		b) Labour					
		i) For making holes in the structure .					
		Mate	day	1.72	582.53	1001.95	L-12
		Mazdoor Semi-skilled)	day	18.00	582.53	10485.48	L-14
		Mazdoor	day	25.00	529.57	13239.25	L-13
		ii) For making and fixing anchorages for cables and placement of cables .					
		Mate	day	4.00	582.53	2330.11	L-12
		Blacksmith	day	20.00	635.48	12709.68	L-02
		Mazdoor	day	80.00	529.57	42365.59	L-13
		iii) For prestressing					
		Mate/Supervisor	day	0.30	582.53	174.76	L-12
		Fitter	day	1.50	635.48	953.23	L-08
		Mazdoor	day	6.00	529.57	3177.42	L-13
		iv) For grouting					
		Mate/Supervisor	day	1.00	582.53	582.53	L-12
		Mason	day	5.00	635.48	3177.42	L-11
		Mazdoor	day	20.00	529.57	10591.40	L-13
		c) Machinery					
		Stressing jack with pump	hour	10.00	131.33	1313.33	P&M-040
		Grouting pump with agitator	hour	10.00	457.34	4573.37	M-111
		d) Overhead charges @ 30% on (a+b+c)				1187361.40	
		e) Contractor's profit @ 16% on (a+b+c+d)				823237.24	
		Cost for 9.28 MT = a+b+c+d+e				5968469.99	
		Rate per MT = (a+b+c+d+e)/9.28				609027.55	
					say	609028.00	
16.15	2808	Replacement of Bearings complete as per Technical Specification					
		Unit = No					
		Taking output = 3 No.					
		Lifting of superstructure span by jacking up from below i.e. by placing the jacks on pier/abutment caps for span length of 30m.					
		a) Lifting of span					
		i) Hire charges for jack of 40 tonne lifting capacity.	Day	3.00	957.46	2872.39	P&M-084
		Mate	day	0.64	582.53	372.82	L-12

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor (Skilled)	day	4.00	688.44	2753.76	L-15
		Mazdoor	day	12.00	529.57	6354.84	L-13
		v) Wooden packing	cum	0.15	14959.29	2243.89	M-195
		b) Replacement of bearing					
		Cost of bearing.	each	3.00	120066.58	360199.75	M-065
		c) Overhead charges @ 30% on (a+b)				112439.24	
		d) Contractor's profit @ 16% on (a+b+c)				77957.87	
		Cost of repair of 3 bearings = a+b+c+d				565194.56	
		Rate of repair per bearing = (a+b+c+d)/3				188398.19	
					say	188398.00	
	Note	The work entails replacement of all the bearings on one side of the span.					
16.16	2808	Rectification of Bearings as per Technical Specifications					
		Unit = 1 No					
		Taking output = 3 No.					
		a) Lifting of superstructure span by jacking up from below i.e. by placing the jacks on pier/abutment caps for span length of 30m.					
		i) Hire charges for jack of 40 tonne lifting capacity.	each	3.00	957.46	2872.39	P&M-084
		ii) Mate	day	0.64	582.53	372.82	L-12
		iii) Mazdoor (Skilled)	day	4.00	688.44	2753.76	L-15
		iv) Mazdoor	day	12.00	529.57	6354.84	L-13
		v) Wooden packing	cum	0.15	14959.29	2243.89	M-195
		b) Cost of parts to be replaced for 3 bearings.	each	3.00	112362.95	337088.86	M-064
		c) Overhead charges @ 30% on (a+b)				105505.97	
		d) Contractor's profit @ 16% on (a+b+c)				73150.80	
		Cost of repair of 3 bearings = a+b+c+d				530343.33	
		Rate of repair per bearing = (a+b+c+d)/3				176781.11	
					say	176781.00	
	Note	The rectification of 3 bearings included in this analysis are on the same side of the span.					
16.17		Replacement of Expansion Joints complete as per drawings					
		Unit -1 RM					
		Taking output = 12 RM					
		a) Material					
		Epoxy for bonding new concrete to old concrete @ 0.8 kg/sqm	kg	9.60	742.50	7127.99	M-095
		M-30 grade cement concrete excluding OH & CP (Rate as per items 14.1 C (i))	cum	3.60	8513.00	30646.80	Item 14.1(C)
		b) Labour					
		Removal of old expansion joint including breaking of concrete, cutting of lugs and shifting of broken material etc.					
		Mate	day	0.26	582.53	151.46	L-12
		Mazdoor	day	6.00	529.57	3177.42	L-13
		Mazdoor (Skilled)	day	0.50	688.44	344.22	L-15

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Overhead charges @ 30% on (a+b)				12434.37	
		d) Contractor's profit @ 16% on (a+b+c)				8621.16	
		Cost for replacement of 12 RM = a+b+c+d				62503.42	
		Rate per RM = (a+b+c+d)/12				5208.62	
					say	<u>5209.00</u>	
		Note The rate for the installation of new expansion joints may be taken from the chapter on superstructure. Broken concrete will have to be replaced which has been included in this analysis.					
16.18		Replacement of Damaged Concrete Railing.					
		Unit = RM					
		Taking output = 10 RM					
		a) Labour					
		Labour for dismantling old railing and disposal of dismantled material.					
		Mate	day	0.20	582.53	116.51	L-12
		Mazdoor	day	5.00	529.57	2647.85	L-13
		b) Machinery					
		Tractor-trolley for disposal of dismantled material	hour	1.00	357.99	357.99	P&M-053
		c) Overhead charges @ 30% on (a+b)				936.70	
		d) Contractor's profit @ 16% on (a+b+c)				649.45	
		Cost for 10 m = a+b+c+d				4708.49	
		Rate per metre = (a+b+c+d)/10				470.85	
					say	<u>471.00</u>	
		Note The rate for the provision of new railing may be adopted from the chapter on superstructure.					
16.19		Replacement of Crash Barrier.					
		Unit = RM					
		Taking output = 10 M					
		a) Labour					
		Labour for dismantling old railing and disposal of dismantled material.					
		Mate	day	0.40	582.53	233.01	L-12
		Mazdoor	day	10.00	529.57	5295.70	L-13
		b) Machinery					
		Tractor-trolley for disposal of dismantled material	hour	1.00	357.99	357.99	P&M-053
		c) Overhead charges @ 30% on (a+b)				1766.01	
		d) Contractor's profit @ 16% on (a+b+c)				1224.43	
		Cost for 10 m = a+b+c+d				8877.14	
		Rate per metre = (a+b+c+d)/10				887.71	
					say	<u>888.00</u>	
		Note The rate for the construction of new crash barrier may be adopted from chapter 8 on Traffic and Transportation.					
16.20		Replacement of Damaged Mild Steel Railing					
		Unit = RM					
		Taking output = 10 M					
		a) Labour					
		Labour for dismantling old railing and disposal of dismantled material.					
		Mate	day	0.16	582.53	93.20	L-12
		Mazdoor	day	4.00	529.57	2118.28	L-13
		b) Machinery					
		Tractor-trolley for disposal of dismantled material	hour	1.00	357.99	357.99	P&M-053
		c) Overhead charges @ 30% on (a+b)				770.84	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Contractor's profit @ 16% on (a+b+c)				534.45	
		Cost for 10 m = a+b+c+d				3874.77	
		Rate per metre = (a+b+c+d)/10				387.48	
					say	387.00	
16.21		Repair of Crash Barrier					
		Repair of concrete crash barrier with cement concert of M-30 grade by cutting and trimming the damaged portion to a regular shape, cleaning the area to be repaired thoroughly, applying cement concert after erection of proper form work.					
		Unit = Running meter.					
		Taking output = 10 M.					
		It is assumed that damage is to the extent of 10 per cent of the volume of concrete .This will require 0.30 cum of concrete.					
		a) Manpower*					
		Mate	day	0.04	582.53	23.30	L-12
		Mazdoor	day	1.00	529.57	529.57	L-13
		* For dismantling and trimming the surface to a regular shape and removal of damaged material.					
		b) Material					
		M-30 grade cement concrete excluding OH & CP (Rate as per items 14.1 C (i))	cum	0.30	8513.00	2553.90	Item 14.1(C)
		This may be priced based on the rate given the chapter of superstructure.					
		c) Overhead charges @ 30% on (a)				165.86	
		d) Contractor's profit @ 16% on (a+c)				115.00	
		Cost for 10 m = a+b+c+d				3387.63	
		Rate per m = (a+b+c+d)/10				338.76	
					say	339.00	
16.22		Repair of RCC Railing					
		Carrying out repair of RCC M30 railing to bring it to the original shape.					
		Unit = Running meter.					
		Taking output = 10 M.					
		It is assumed that damage is to the extent of 10 per cent .					
		a) Material					
		M-30 grade cement concrete excluding OH & CP (Rate as per items 14.1 C (i))	cum	0.10	8513.00	851.30	Item 14.1(C)
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.01	62657.00	814.54	Item 14.2 A
		b) Labour*					
		Mate	day	0.016	582.53	9.32	L-12
		mazdoor	day	0.20	529.57	105.91	L-13
		* For dismantling and trimming the surface to a regular shape and removal of damaged material.					
		c) Overhead charges @ 30% on (b)				34.57	
		d) Contractor's profit @ 16% on (b+c)				23.97	
		Cost for 10 m = a+b+c+d				1839.61	
		Rate per m = (a+b+c+d)/10				183.96	
					say	184.00	
16.23		Repair of Steel Railing					
		Repair of steel railing to bring it to the original shape					
		It is assumed that the damage to the steel railing is to the extent of 10 per cent .					
		Unit = Running meter.					
		Taking output = 10 M.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Material					
		Mild steel ISMC series	kg	29.00	60.67	1759.35	M-179/1000
		Flat iron	kg	10.00	60.67	606.67	M-179/1000
		MS Bolt and nuts	kg	1.00	99.87	99.87	M-130
		Add 5 per cent of cost of material for painting.				123.29	
		b) Labour					
		Mate	day	0.016	582.53	9.32	L-12
		Mazdoor (Skilled)	day	0.20	688.44	137.69	L-15
		Mazdoor	day	0.20	529.57	105.91	L-13
		c) Overhead charges @ 30% on (a+b)				852.63	
		d) Contractor's profit @ 16% on (a+b+c)				591.16	
		Cost of repair for 10m = a+b+c+d				4285.90	
		Cost of meter = (a+b+c+d)/10				428.59	
					say	<u>429.00</u>	