



## **National Highways & Infrastructure Development Corporation Limited**

**REHABILITATION AND UPGRADATION OF SECTION FROM KM  
206.000 TO 239.425 (NIMBUTALA TO AUSTIN CREEK) OF NH-  
223 TO 2-LANE WITH HARD SHOULDER IN THE UNION  
TERRITORY OF ANDAMAN & NICOBAR ISLANDS (PACKAGE NO. 4)**

### **RATE ANALYSIS (Package-4)**

**November-2017**



**C E C Projects Pvt. Ltd.**

**In JV with Chaitanya Projects Consultancy Pvt. Ltd**

2<sup>nd</sup> Floor, Plot No. 21-22, R.K.Tower,

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**(A) Usage Rates of Plant and Machinery**

Sl. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate As Per DSR/SDB
P&M-001	Air Compressor	General Purpose	capacity in cfm	170/250	hour	370.80
P&M-002	Batching and Mixing Plant (a) 30 cum capacity	Concrete Mixing	cum/hour	20	hour	2592.00
P&M-003	Batching and Mixing Plant (b) 15 - 20 cum capacity	Concrete Mixing	cum/hour	13	hour	2160.00
P&M-004	Bitumen Pressure Distributor	Applying bitumen tack coat	sqm/hour	1750	hour	1245.60
P&M-005	Bitumen Boiler oil fired	Bitumen Spraying	capacity in litre	1500	hour	230.40
P&M-006	Concrete Paver Finisher with 40 HP Motor	Paving of concrete surface	cum / hour	20	hour	3330.00
P&M-007	Concrete Pump of 45 & 30 cum capacity	Pumping of concrete	cum / hour	33 / 22	hour	297.00
P&M-008	Concrete Bucket	For Pouring concrete	capacity in cum	1	hour	18.00
P&M-009	Concrete Mixer (a) 0.4/0.28 cum	Concrete Mixing	cum/hour	2.5	hour	270.00
P&M-010	Concrete Mixer (b) 1 cum	Concrete Mixing	cum/hour	7.5	hour	270.00
P&M-011	Crane (a) 80 tonnes	Lifting Purpose			hour	1485.00
P&M-012	Cranes b) 35 tonnes	Lifting Purpose			hour	990.00
P&M-013	Cranes c) 3 tonnes	Lifting Purpose			hour	414.00
P&M-014	Dozer D - 80 - A 12	Spreading /Cutting / Clearing	cum/hour	300/ 150/250	hour	4320.00
P&M-015	Dozer D - 50 - A 15	Spreading /Cutting / Clearing	cum/hour	200/ 120/150	hour	2561.40
P&M-016	Emulsion Pressure Distributor	Applying emulsion tack coat	sqm/hour	1750	hour	928.80
P&M-017	Front End loader 1 cum bucket capacity	Soil loading / Aggregate loading	cum/hour	60 /25	hour	936.00
P&M-018	Generator (a) 125 KVA	Genration of electric Energy	KVA	100	hour	2183.00
P&M-019	Generator (b) 63 KVA	Genration of electric Energy	KVA	50	hour	951.39
P&M-020	GSB Plant 50 cum	Producing GSB	cum/hour	40	hour	1206.00
P&M-021	Hotmix Plant - 120 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	40	hour	27180.00
P&M-022	Hotmix Plant - 100 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	30	hour	20100.60
P&M-023	Hotmix Plant - 60 to 90 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	25	hour	16074.00
P&M-024	Hotmix Plant - 40 to 60 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	17	hour	12870.00
P&M-025	Hydraulic Chip Spreader	Surface Dressing	sqm/hour	1500	hour	3060.00
P&M-026	Hydraulic Excavator of 1 cum bucket	Soil Ordinary/Soil Marshy / Soil Unsuitable	cum/hour	60 /60 /60	hour	1512.00
P&M-027	Integrated Stone Crusher 100THP	Crushing of Spalls	TPH	100	hour	10062.00
P&M-028	Integrated Stone Crusher 200 HP	Crushing of Spalls	TPH	200	hour	21168.00
P&M-029	Kerb Casting Machine	Kerb Making	Rm/hour	80	hour	360.00
P&M-030	Mastic Cooker	Mastic Wearing coat	capacity in tonne	1	hour	72.00
P&M-031	Mechanical Broom Hydraulic	Surface Cleaning	sqm/hour	1250	hour	414.00
P&M-032	Motor Grader 3.35 mtr blade	Clearing /Spreading /GSB /WBM	cum/hour	200/200/50/50	hour	2781.00
P&M-033	Mobile slurry seal equipment	Mixing and laying slurry seal	sqm/hour	2700	hour	1170.00
P&M-034	Paver Finisher Hydrostatic with sensor control 100 TPH	Paving of DBM/ BM/SDC/ Premix	cum/hour	40	hour	3105.00
P&M-035	Paver Finisher Mechanical 100 TPH	Paving of WMM /Paving of DLC	cum/hour	40/30	hour	1132.20
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	6345.00
P&M-037	Pneumatic Road Roller	Rolling of Asphalt Surface	cum/hour	25	hour	1443.60
P&M-038	Pneumatic Sinking Plant	Pneumatic Sinking of wells	cum/hour	1.5 to 2.00	hour	4842.00
P&M-039	Pot Hole Repair Machine	Repair of potholes	cum/hour	4	hour	1053.00
P&M-040	Prestressing Jack with Pump & access	Stressing of steel wires/stands			hour	149.40
P&M-041	Ripper	Scarifying	cum/hour	60	hour	32.40
P&M-042	Rotavator	Scarifying	cum/hour	25	hour	19.80
P&M-043	Road marking machine	Road marking	Sqm/hour	100	hour	108.00

P&M-044	Smooth Wheeled Roller 8 tonne	Soil Compaction /BM Compaction	cum/hour	70/25	hour	534.60
P&M-045	Tandem Road Roller	Rolling of Asfalt Surface	cum/hour	30	hour	1328.40
P&M-046	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	km	28.08
P&M-047	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	tonne.km	3.13
P&M-048	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	hour	360.00
P&M-049	Transit Mixer 4.0/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	hour	1080.00
P&M-050	Transit Mixer 4/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	tonne.km	6.44
P&M-051	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	hour	990.00
P&M-052	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	tonne.km	8.51
P&M-053	Tractor	Pulling	capacity in HP	50	hour	421.20
P&M-054	Tractor with Rotevator	Rate of Tractor + Rotevator			hour	441.00
P&M-055	Tractor with Ripper	Rate of Tractor 6+ Ripper			hour	453.60
P&M-056	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	km	26.10
P&M-057	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	hour	832.59
P&M-058	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	tonne.km	2.88
P&M-059	Vibratory Roller 8 tonne	Earth or soil / GSB / WBM	cum/hour	100/60/60	hour	832.59
P&M-060	Water Tanker (Tractor Mounted)	Water Transport	capacity in KL	6	hour	150.00
P&M-061	Water Tanker (Truck Mounted)	Water Transport	capacity in KL	6	Km	28.08
P&M-062	Wet Mix Plant 60 TPH	Wet Mix	cum/hour	25	hour	1398.60
<b>Sl. No.</b>	<b>Description of Machine</b>					
P&M-067	Cement concrete batch mix plant @ 175 cum per hour (effective output)				hour	7013.16
P&M-068	Cement concrete batch mix plant @ 75 cum per hour				hour	3005.64
P&M-079	Generator 33 KVA				hour	432.00
P&M-080	Generator 100 KVA				hour	810.00
P&M-081	Generator 250 KVA				hour	700.00
P&M-083	Joint Cutting Machine				hour	313.83
P&M-086	Plate Compactor				hour	417.78
P&M-088	Texturing Machine				hour	105.44
P&M-094	Wet Mix Plant 75 TPH				hour	2433.00

**(B) Labour (Source - APWD)**

Sl. No.	Description of Labour	Unit	Rate
L-01	Blacksmith (IInd class)	day	420
L-02	Blacksmith (1st class)/ Welder/ Plumber/ Electrician	day	490
L-03	Blaster (Stone cutter)	day	420
L-04	Carpenter I Class	day	490
L-05	Chiseller (Head Mazdoor)	day	490
L-06	Driller (Jumper)	day	420
L-08	Filter	day	420
L-10	Mason (IInd class)	day	420
L-11	Mason (1st class)	day	490
L-12	Mate / Supervisor	day	365
L-13	Mazdoor	day	350
L-14	Mazdoor/Dresser (Semi Skilled)	day	420
L-15	Mazdoor/Dresser/Sinker (Skilled)	day	490
L-18	Painter I class	day	490

**(C) Materials**

Sl. No.	Description	Unit	Rate At Quarry	Carriage Cost	Final Rate
M-001	Stone Boulder of size 150 mm and below at Crusier Plant (Stone Spalls)	cum	1682.00	424.00	2106.00
M-002	Supply of quarried stone 150 - 200 mm size for Hand Broken at site	cum	1682.00	3006.27	4688.27
M-003	Boulder with minimum size of 300 mm for Pitching at Site	cum	1682.00	424.00	2106.00
M-004	Coarse sand at Mixing Plant	cum	1300.00	2989.86	4289.86
M-004	Coarse sand at Site	cum	1300.00	2989.86	4289.86
M-005	Medium sand at Site	cum	1200.00	2989.86	4189.86
M-006	Fine sand at Site	cum	1150.00	2989.86	4139.86
M-007	Moorum at Site	cum	1616.16	334.00	1950.16
M-009	Granular Material or hard murrum for GSB works at Site	Cum	1616.16	334.00	1950.16
M-010	Granular Material or hard murrum for GSB works at Mixing Plant	Cum	1616.16	334.00	1950.16
M-011	Fly ash conforming to IS: 3812 ( Part II & I) atHMP Plant / Batching Plant / Crushing Plant	Cum	1616.16	334.00	1950.16
M-012	Filter media/Filter Material as per Table 300-3 (MoRT&H Specification)	Cum	1469.60		1469.60
	<b>Description</b>	<b>Unit</b>	<b>Rate At Quarry</b>	<b>Carriage Cost</b>	<b>Final Rate</b>
M-013	Close graded Granular sub-base Material 53 mm to 9.5 mm	cum	966.67	412.64	1379.31
M-014	Close graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	980.00	412.64	1392.64
M-015	Close graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	1000.00	412.64	1412.64
M-016	Close graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	1175.00	412.64	1587.64
M-017	Close graded Granular sub-base Material 9.5 mm to 2.36 mm	cum	1220.00	412.64	1632.64
M-018	Close graded Granular sub-base Material 4.75mm to 2.36 mm	cum	1350.00	412.64	1762.64
M-019	Close graded Granular sub-base Material 4.75mm to 75 micron mm	cum	1350.00	412.64	1762.64
M-020	Close graded Granular sub-base Material 2.36 mm	cum	1350.00	412.64	1762.64
M-021	Stone crusher dust finer than 3mm with not more than 10% passing 0.075 sieve.	cum	1350.00	412.64	1762.64
M-022	Coarse graded Granular sub-base Material 2.36 mm & below	cum	1350.00	412.64	1762.64
M-023	Coarse graded Granular sub-base Material 4.75mm to 75 micron mm	cum	1350.00	412.64	1762.64
M-024	Coarse graded Granular sub-base Material 4.75 mm to 2.36 mm	cum	1350.00	412.64	1762.64
M-025	Coarse graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	1175.00	412.64	1587.64
M-026	Coarse graded Granular sub-base Material 26.5 mm to 4.75 mm	cum	1100.00	412.64	1512.64
M-027	Coarse graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	1000.00	412.64	1412.64
M-028	Coarse graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	980.00	412.64	1392.64

M-029	Coarse graded Granular sub-base Material 53 mm to 26 .5mm	cum	933.33	412.64	1345.97
M-030	Aggregates below 5.6 mm	cum	1200.00	3006.27	4206.27
M-031	Aggregates 22.4 mm to 2.36 mm	cum	1137.50	3006.27	4143.77
M-032	Aggregates 22.4 mm to 5.6 mm	cum	1066.67	3006.27	4072.94
M-033	Aggregates 45 mm to 2.8 mm	cum	1111.11	3006.27	4117.38
M-034	Aggregates 45 mm to 22.4 mm	cum	966.67	3006.27	3972.94
M-035	Aggregates 53 mm to 2.8 mm	cum	1090.00	3006.27	4096.27
M-036	Aggregates 53 mm to 22.4 mm	cum	950.00	3006.27	3956.27
M-037	Aggregates 63 mm to 2.8 mm	cum	1072.73	3006.27	4079.00
M-038	Aggregates 63 mm to 45 mm	cum	900.00	3006.27	3906.27
M-039	Aggregates 90 mm to 45 mm	cum	900.00	3006.27	3906.27
M-040	Aggregates 10 mm to 5 mm	cum	1175.00	3006.27	4181.27
M-041	Aggregates 11.2 mm to 0.09 mm	cum	1220.00	3006.27	4226.27
M-042	Aggregates 13.2 mm to 0.09 mm	cum	1183.33	3006.27	4189.61
M-043	Aggregates 13.2 mm to 5.6 mm	cum	1100.00	3006.27	4106.27
M-044	Aggregates 13.2 mm to 10 mm	cum	1000.00	3006.27	4006.27
M-045	Aggregates 20 mm to 10 mm	cum	1000.00	3006.27	4006.27
M-046	Aggregates 25 mm to 10 mm	cum	1000.00	3006.27	4006.27
M-047	Aggregates 19 mm to 6 mm	cum	1050.00	3006.27	4056.27
M-048	Aggregates 37.5 mm to 19 mm	cum	966.67	3006.27	3972.94
M-049	Aggregates 37.5 mm to 25 mm	cum	950.00	3006.27	3956.27
M-050	Aggregates 6 mm nominal size	cum	1200.00	3006.27	4206.27
M-051	Aggregates 10 mm nominal size	cum	1000.00	3006.27	4006.27
M-052	Aggregates 13.2/12.5 mm nominal size	cum	1000.00	3006.27	4006.27
M-053	Aggregates 20 mm nominal size	cum	1000.00	3006.27	4006.27
M-054	Aggregates 25 mm nominal size	cum	1000.00	3006.27	4006.27
M-055	Aggregates 40 mm nominal size	cum	900.00	3006.27	3906.27

Sl. No.	Description	Unit	Rate At Quarry	Carriage Cost	Final Rate
M-056	AC pipe 100 mm dia	metre	50.00		50.00
M-059	Aluminium alloy plate 2mm Thick	sqm	9605.98		9605.98
M-060	Aluminium alloy/galvanised steel	tonne	38423.91		38423.91
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	sqm	8965.58		8965.58
M-062	Aluminium studs 100 x 100 mm fitted with lense reflectors	nos	173.81		173.81
M-063	Barbed wire	kg	55.64		55.64
M-072	Binding wire	kg	55.00	3.24	58.24
M-073	Bitumen ( Cationic Emulsion )	tonne	25800.00	4625.49	30425.49
M-074	Bitumen (VG30)	tonne	24340.00	4625.49	28965.49
M-077	Bitumen (emulsion)	tonne	20670.00	4625.49	25295.49
M-078	Bitumen (CRMB)	tonne	30270.00	4625.49	34895.49
M-081	Cement	tonne	7560.00	3240.63	10800.63
M-082	Cold twisted bars (HYSD Bars)	tonne	44500.00	4332.85	48832.85
M-087	Corrosion resistant Structural steel	tonne	44940.10	4332.85	49272.95
M-088	Corrugated sheet, 3 mm thick, "Thrie" beam section railing	kg	48.65		48.65
M-090	Curing compound	liter	126.41		126.41
M-091	Delineators from ISI certified firm as per the standard drawing given in IRC - 79	each	815.81		815.81
M-092	Earth Cost or compensation for earth taken from private land	cum	238.00	98.67	336.67
M-097	Epoxy primer	kg	12.64		12.64
M-101	Galvanised MS flat clamp	nos	15.42		15.42
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	98.69		98.69
M-110	GI bolt 10 mm Dia	nos	15.10		15.10
M-118	Hot applied thermoplastic compound	litre	205.58		205.58
M-119	HTS strand	tonne	50600.00	4332.85	54932.85
M-120	Joint Sealant Compound	kg	25.28		25.28
M-123	M.S. Clamps	nos	33.26		33.26
M-126	Mild Steel bars	tonne	51700.00	4332.85	56032.85
M-130	Nuts and bolts	kg	60.00	3.24	63.24
M-131	Paint	litre	233.78		233.78
M-132	Pavement Marking Paint	litre	233.78		233.78
M-137	Pipes 200 mm dia, 2.5 m long for drainage	metre	175.09		175.09
M-138	Plastic sheath, 1.25 mm thick for dowel bars	sqm	15.80		15.80
M-141	Pre moulded Joint filler,25 mm thick for expansion joint.	sqm	987.63		987.63
M-142	Pre-coated stone chips of 13.2 mm nominal size	cum	640.25		640.25
M-144	Pre-moulded asphalt filler board	sqm	987.63		987.63
M-148	Random Rubble Stone	cum	700.00	424.00	1124.00
M-149	RCC Pipe NP 4 heavy duty non presure pipe 1000 mm dia	metre	2961.97		2961.97
M-150	RCC Pipe NP 4 heavy duty non presure pipe 1200 mm dia	metre	4210.99		4210.99
M-152	Reflectorising glass beads	kg	66.81		66.81
M-163	Selected Earth	cum	23.65		23.65
M-164	Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	15.80		15.80
M-175	Steel pipe 50 mm external dia as per IS:1239	metre	229.34		229.34
M-178	Strip seal expansion joint	metre	8407.70		8407.70
M-179	Structural Steel	tonne	60000.00	4332.85	64332.85
M-180	Super plastisizer admixture IS marked as per 9103-1999	kg	158.02		158.02
M-182	Through and bond stone	each	20.00	10	30.00
M-184	Tiles size 300 x 300 mm and 25 mm thick	each	43.07		43.07
M-187	Tube anchorage set complete with bearing plate, permanent wedges etc	nos	1105.00		1105.00

M-188	Unstaked lime		tonne	7500.00	334.00	7834.00
M-189	Water		KL	240.00		240.00
M-190	Water based cement paint		litre	35.00		35.00
	Overheads for Road Works	08%				
	Contractors profit for Road Works	10%				
	Overheads for Bridge Works	20%				
	Overheads for Bridge Works (Rehabilitation)	30%				
	Contractors profit for Bridge Works	10%				
	Lead from Mixing Plant to working site		30 km			
	Lead for E/W borrow area to site		1.5 km			
	Lead for fly ash from source to site	input	km			

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
	<b>CHAPTER-1</b>			
	<b>CARRIAGE OF MATERIALS</b>			
1.1	<b>Loading and unloading of stone boulder / stone aggregates / sand / kanker / moorum.</b> (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)	cum	78.00	78.78
1.2	<b>Loading and Unloading of Boulders by Manual Means</b>	cum	104.00	105.04
1.3	<b>Loading and Unloading of Cement or Steel by Manual Means and stacking.</b>	tonne	239.00	241.39
1.4	<b>Cost of Haulage Excluding Loading and Unloading</b>			
(i)	<b>Surfaced Road</b>	tonne.km	2.48	2.50
(ii)	<b>Unsurfaced Gravelled Road</b>	tonne.km	3.00	3.03
(iii)	<b>Katcha Track and Track in river bed / nallah bed and choe bed.</b>	tonne.km	6.00	6.06
1.5	<b>Hand Broken Stone Aggregates 63 mm nominal size</b> (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	5704.00	5761.04
1.6	<b>Crushing of stone aggregates 13.2 mm nominal size.</b> (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	2921.00	2950.21
1.7	<b>Crushing of stone aggregates 20 mm nominal size</b> (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	2478.00	2502.78
1.8	<b>Crushing of stone aggregates 40 mm nominal size</b> (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	2091.00	2111.91
	<b>CHAPTER-2</b>			
	<b>SITE CLEARANCE</b>			
2.1	<b>Cutting of Trees, including Cutting of Trunks, Branches and Removal</b> (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)	<b>Girth from 300 mm to 600 mm</b>	each	308.00	311.08
(ii)	<b>Girth from 600 mm to 900 mm</b>	each	542.00	547.42
(iii)	<b>Girth from 900 mm to 1800 mm</b>	each	1066.00	1076.66
(iv)	<b>Girth above 1800 mm</b>	each	2033.00	2053.33
2.2	<b>Clearing Grass and Removal of Rubbish</b>	hectare	21657.00	21873.57
2.3	<b>Clearing and Grubbing Road Land</b> . (Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.)			
(i)	<b>By Manual Means:-</b>			
A	<b>In area of light jungle</b>	hectare	65472.00	66126.72
B	<b>In area of thorny jungle</b>	hectare	87630.00	88506.30
(ii)	<b>By Mechanical Means</b>			
A	<b>In area of light jungle</b>	hectare	53555.00	54090.55
B	<b>In area of thorny jungle</b>	hectare	64935.00	65584.35
2.4	<b>Dismantling of Structures</b> (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)	<b>Lime /Cement Concrete</b>			
I	<b>By Manual Means</b>			
A	<b>Lime Concrete, cement concrete grade M-10 and below</b>	cum	455.00	459.55
B	<b>Cement Concrete Grade M-15 &amp; M-20</b>	cum	541.00	546.41
C	<b>Prestressed / Reinforced cement concrete grade M-20 &amp; above</b>	cum	1441.00	1455.41
II	<b>By Mechanical Means for items No. 202( b) &amp; ( c)</b>			
A	<b>Cement Concrete Grade M-15 &amp; M-20</b>	cum	534.00	539.34
B	<b>Prestressed / Reinforced cement concrete grade M-20 &amp; above</b>	cum	941.00	950.41
(ii)	<b>Dismantling Brick / Tile work</b>			
A	<b>In lime mortar</b>	cum	281.00	283.81
B	<b>In cement mortar</b>	cum	368.00	371.68
C	<b>In mud mortar</b>	cum	247.00	249.47
D	<b>Dry brick pitching or brick soling</b>	cum	229.00	231.29
(iii)	<b>Dismantling Stone Masonry</b>			
A	<b>Rubble stone masonry in lime mortar</b>	cum	316.00	319.16
B	<b>Rubble stone masonry in cement mortar.</b>	cum	368.00	371.68
C	<b>Rubble Stone Masonry in mud mortar.</b>	cum	281.00	283.81
D	<b>Dry rubble masonry</b>	cum	264.00	266.64
E	<b>Dismantling stone pitching/ dry stone spalls.</b>	cum	247.00	249.47
F	<b>Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials.</b>	cum	281.00	283.81
(iv)	<b>Wood work wrought framed and fixed in frames of trusses upto a height of 5 m above plinth level</b>	cum	694.00	700.94

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
(v)	<b>Steel work in all types of sections upto a height of 5 m above plinth level excluding cutting of rivet.</b>			
A	Including dismembering	tonne	1809.00	1827.09
B	Excluding dismembering.	tonne	1334.00	1347.34
C	Extra over item No( V ) A and( V ) B for cutting rivets.	tonne	13.00	13.13
(vi)	<b>Scraping of bricks dismantled from brick work including stacking.</b>			
A	In lime/Cement mortar	1000 numbers	1516.00	1531.16
B	In mud mortar	1000 numbers	541.00	546.41
(vii)	<b>Scraping of Stone from dismantled stone masonry</b>			
A	In cement and lime mortar	cum	608.00	614.08
B	In Mud mortar	cum	129.00	130.29
(viii)	<b>Scarping plaster in lime or cement mortar from brick/ stone masonry</b>	sqm	19.00	19.19
(ix)	<b>Removing all type of hume pipes and stacking within a lead of 1000 metres including earthwork and dismantling of masonry works.</b>			
A	Up to 600 mm dia	metre	225.00	227.25
B	Above 600 mm to 900 mm dia	metre	304.00	307.04
C	Above 900 mm	metre	521.00	526.21
2.5	<b>Dismantling of Flexible Pavements</b> (Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately)			
I	<b>By Manual Means</b>			
A	Bituminous courses	cum	840.00	848.40
B	Granular courses	cum	598.00	603.98
II	<b>By Mechanical Means</b>			
A	Bituminous course	cum	328.00	331.28
2.6	<b>Dismantling of Cement Concrete Pavement</b> (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	1484.00	1498.84
2.7	<b>Dismantling Guard Rails</b> (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	90.00	90.90
2.8	<b>Dismantling Kerb Stone</b> (Dismantling kerb stone by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre)	metre	17.00	17.17
2.9	<b>Dismantling Kerb Stone channel</b> (Dismantling kerb stone channel by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre)	metre	25.00	25.25
2.10	<b>Dismantling Kilometre Stone</b> (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	443.00	447.43
B	Ordinary KM Stone	each	267.00	269.67
C	Hectometre Stone	each	53.00	53.53
2.11	<b>Dismantling of Fencing</b> (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	61.00	61.61
2.12	<b>Dismantling of CI Water Pipe Line</b> (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	151.00	152.51
2.14	<b>Removal of Telephone / Electric Poles and Lines</b> (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	209.00	211.09
	<b>CHAPTER-3</b>			
	<b>EARTH WORK, EROSION CONTROL AND DRAINAGE</b>			
3.1	<b>Excavation in Soil by Manual Means.</b> (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 upto1000 metres.)	cum	260.00	262.60
3.2	<b>Excavation in ordinary rock by manual means</b> (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	350.00	353.50
3.3	<b>Excavation in Soil with Dozer with lead upto 100 metres</b> ( 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 lead50 metres), including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	cum	191.00	192.91
3.4	<b>Excavation in Ordinary Rock with Dozer with lead upto 100 metres</b> (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	297.00	299.97
3.5	<b>Excavation in Hard Rock (requiring blasting) with disposal upto 1000 metres</b> (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	263.00	265.63

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
3.6	<b>Excavation in Soil using Hydraulic Excavator CK 90 and Tipper with disposal upto 1000 metres.</b> (Excavation for roadway 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)	cum	51.00	51.51
3.7	<b>Excavation in Ordinary Rock using Hydraulic Excavator CK-90 and Tipper with disposal upto 1000 metres.</b> (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.)	cum	68.00	68.68
3.8	<b>Excavation in Hard Rock (blasting prohibited)</b> (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	<b>Mechanised</b>	cum	497.00	501.97
B	<b>Manual Method</b>	cum	1447.00	1461.47
3.9	<b>Excavation in Hard Rock (controlled blasting) with disposal upto 1000 metres</b> (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	270.00	272.70
3.10	<b>Excavation in Marshy Soil</b> (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.)	cum	58.00	58.58
3.11	<b>Removal of Unserviceable Soil with Disposal upto 1000 metres</b> (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	52.00	52.52
3.12	<b>Pre-splitting of Rock Excavation Slopes</b> (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	117.00	118.17
3.13	<b>Excavation for Structures</b> (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)			
(i)	<b>Ordinary soil</b>			
A	<b>Manual Means (Depth upto 3 m)</b>	cum	347.00	350.47
B	<b>Mechanical Means (Depth upto 3 m)</b>	cum	47.00	47.47
(ii)	<b>Ordinary rock (not requiring blasting)</b>			
A	<b>Manual Means (Depth upto 3 m)</b>	cum	433.00	437.33
B	<b>Mechanical Means</b>	cum	62.00	62.62
(iii)	<b>Hard rock ( requiring blasting )</b>			
A	<b>Manual Means</b>	cum	613.00	619.13
(iv)	<b>Hard rock ( blasting prohibited )</b>			
A	<b>Mechanical Means</b>	cum	657.00	663.57
(v)	<b>Marshy soil</b>			
A	<b>Manual means ( upto 3 m depth)</b>	cum	581.00	586.81
B	<b>Mechanical Means</b>	cum	150.00	151.50
3.14	<b>Scarifying Existing Granular Surface to a Depth of 50 mm by Manual Means</b> (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	30.00	30.30
3.15	<b>Scarifying existing bituminous surface to a depth of 50 mm by mechanical means</b> (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	5.00	5.05
3.16	<b>Embankment Construction with Material Obtained from Borrow Pits</b> (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	587.00	592.87
3.17	<b>Construction of Embankment with Material Deposited from Roadway Cutting</b> (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	146.00	147.46
3.18	<b>Construction of Subgrade and Earthen Shoulders</b> (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	624.00	630.24
3.19	<b>Compacting Original Ground</b>			
Case-I	<b>Compacting original ground supporting subgrade</b> (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	68.00	68.68
Case-II	<b>:Compacting original ground supporting embankment</b>	cum	32.00	32.32
3.20	<b>Stripping and Storing Top Soil</b> (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	268.00	270.68
3.21	<b>Stripping, storing and re-laying top soil from borrow areas in agriculture fields.</b> (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	106.00	107.06

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
3.24	<b>Surface Drains in Soil</b> (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	<b>Mechanical means</b>	metre	70.00	70.70
B	<b>Manual Means</b>	metre	87.00	87.87
3.25	<b>Surface Drains in Ordinary Rock</b> (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	<b>Mechanical Means</b>	metre	142.00	143.42
B	<b>Manual Means</b>	metre	130.00	131.30
3.26	<b>Surface Drains in Hard Rock</b> (Rate per metre may be worked out based on quantity of hard rock as per design.)	metre		0.00
3.28	<b>Aggregate Sub- Surface Drains</b> (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	299.00	301.99
3.29	<b>Underground Drain at Edge of Pavement</b> (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	7003.00	7073.03
3.30	<b>Preparation and Surface Treatment of formation.</b> (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	3.00	3.03
3.31	<b>Construction of Rock fill Embankment</b> (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	80.00	80.80
3.32	<b>Excavation in Hill Area in Soil by Mechanical Means</b> (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	174.00	175.74
3.33	<b>Excavation in Hilly Area in Ordinary Rock by Mechanical Means not Requiring Blasting.</b> (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	265.00	267.65
3.34	<b>Excavation in Hilly Areas in Hard Rock Requiring Blasting</b> (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	290.00	292.90
3.35	<b>Work in Urban Roads</b> (The cost of earth work in urban roads inhabited area will be comparatively higher due to following reasons:)			0.00
	<b>CHAPTER-4</b>			
	<b>SUB-BASES, BASES ( NON- BITUMINOUS) AND SHOULDERS</b>			
4.1	<b>Granular Sub-base with Close Graded Material (Table:- 400-1)</b>			
A	<b>Plant Mix Method</b> (Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401 )			
(i)	<b>for grading- I Material</b>	cum	2919.00	2948.19
(ii)	<b>for grading- II Material</b>	cum	3019.00	3049.19
(iii)	<b>for grading-III Material</b>	cum	3162.00	3193.62
B	<b>By Mix in Place Method</b> (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)	<b>for grading- I Material</b>	cum	2488.00	2512.88
(ii)	<b>for grading- II Material</b>	cum	2589.00	2614.89
(iii)	<b>for grading-III Material</b>	cum	2731.00	2758.31
4.2	<b>Granular Sub-Base with Coarse Graded Material ( Table:- 400- 2)</b> (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)	<b>for grading- I Material</b>	cum	2408.00	2432.08
(ii)	<b>for grading- II Material</b>	cum	2516.00	2541.16
(iii)	<b>for grading-III Material</b>	cum	2624.00	2650.24
4.3	<b>Lime Stabilisation for Improving Subgrade</b> (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	<b>By Mechanical Means</b>	cum	678.00	684.78
B	<b>By Manual Means</b>	cum	693.00	699.93
4.4	<b>Lime Treated Soil for Sub- Base</b> (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	735.00	742.35
4.5	<b>Cement Treated Soil Sub Base/ Base</b> (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	1145.00	1156.45

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
4.6	<b>Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4 in Sub base/ Base</b> (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)	<b>For Sub-Base course</b>	cum	3532.00	3567.32
(ii)	<b>For Base course</b>	cum	3699.00	3735.99
4.7	<b>Making 50 mm x 50 mm Furrows</b> (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	956.00	965.56
4.8	<b>Inverted Choke</b> (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	1970.00	1989.70
4.10	<b>Crushed Cement Concrete Sub-base / Base</b> (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	505.00	510.05
4.11	<b>Penetration Coat Over Top Layer of Crushed Cement Concrete Base</b> (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	54.00	54.54
4.12	<b>Wet Mix Macadam</b> (Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.)	cum	5832.00	5890.32
4.13	<b>Construction of Median and Island with Soil Taken from Roadway Cutting</b> (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	356.00	359.56
4.14	<b>Construction of Median and Island with Soil Taken from Borrow Areas</b> (Construction of median and Island above road level with approved material brought from borrow pits, spread, sloped and compacted as per clause 407)	cum	371.00	374.71
4.15	<b>Construction of Shoulders</b> (A. Earthen Shoulders)			
4.16	<b>Footpaths and Separators</b> (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	1393.00	1406.93
4.17	<b>Crusher Run Macadam Base</b> (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)			
<b>A</b>	<b>By Mix in Place Method</b>			
(i)	<b>For 53 mm maximum size</b>	cum	1795.00	1812.95
(ii)	<b>For 45 mm maximum size</b>	cum	1895.00	1913.95
<b>B</b>	<b>By Mixing Plant :</b>			
(i)	<b>For 53 mm maximum size</b>	cum	2192.00	2213.92
(ii)	<b>For 45 mm maximum size</b>	cum	1446.00	1460.46
	<b>CHAPTER-5</b>			
	<b>BASES AND SURFACE COURSES (BITUMINOUS)</b>			
5.1	<b>Prime coat</b> (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	20.00	20.20
5.2	<b>Tack coat</b>			
	<b>Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.</b>	sqm	8.00	8.08

### Summary of Rate Analysis

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
5.3	<b>Bituminous Macadam</b> (Providing and laying bituminous macadam with 40-60 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) <b>for Grading I ( 40 mm nominal size )</b>	cum	10931.00	11040.31
	(ii) <b>for GradingII(19 mm nominal size)</b>	cum	11004.00	11114.04
5.4	<b>Bituminous Penetration Macadam</b> (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)			
	<b>A 50 mm thick</b>	sqm	254.00	256.54
	<b>B 75 mm thick</b>	sqm	537.00	542.37
5.5	<b>Built-Up-Spray Grout</b> (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	250.00	252.50
5.6	<b>Dense Graded Bituminous Macadam</b> (Providing and laying dense bituminous macadam with 40-60 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) <b>for Grading I ( 40 mm nominal size )</b>	cum	12399.00	12522.99
	(ii) <b>for GradingII(19 mm nominal size)</b>	cum	12432.00	12556.32
5.7	<b>Semi - Dense Bituminous Concrete</b> (Providing and laying semi dense bituminous concrete with 40-60 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) <b>for Grading I ( 13 mm nominal size )</b>	cum	9823.00	9921.23
	(ii) <b>for GradingII(10 mm nominal size)</b>	cum	10129.00	10230.29
5.8	<b>Bituminous Concrete</b> (Providing and laying bituminous concrete with 40-60 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) <b>for Grading-I ( 13 mm nominal size )</b>	cum	13243.00	13375.43
	(ii) <b>for Grading-II(10 mm nominal size)</b>	cum	13260.00	13392.60
5.9	<b>Surface Dressing</b> (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)			
	<b>Case -I :-19 mm nominal chipping size</b>	sqm	59.00	59.59
	<b>Case - II 13 mm nominal size chipping</b>	sqm	47.00	47.47
5.10	<b>Open - Graded Premix Surfacing</b> (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) <b>Case - I: Mechanical method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour .</b>	sqm	168.00	169.68
	(ii) <b>Case - II: Open-Graded Premix Surfacing using cationic Bitumen Emulsion</b>	sqm	179.00	180.79
5.12	<b>Seal Coat</b> (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) <b>Case - I : Type A</b>	sqm	46.00	46.46
	(ii) <b>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.)</b>	sqm	50.00	50.50
5.13	<b>Supply of Stone Aggregates for Pavement Courses</b> (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		

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
5.14	<b>Mastic Asphalt</b> (Providing and laying 25 mm thick mastic asphalt wearing course with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated 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	616.00	622.16
5.15	<b>Slurry Seal</b> 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)	<b>5 mm thickness</b>	sqm	43.00	43.43
(ii)	<b>3 mm thickness</b>	sqm	30.00	30.30
(iii)	<b>1.5 mm thickness</b>	sqm	18.00	18.18
5.17	<b>Fog Spray</b>	sqm	20.00	20.20
added	<b>1.In case it is decided by the engineer to blind the fog spray, the following may be added</b>	sqm	5.00	5.05
5.21	<b>Crack Prevention Courses</b>			
(i)	<b>Stress Absorbing Membrane (SAM) crack width less than 6 mm</b> (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	91.00	91.91
(ii)	<b>Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm</b> (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	97.00	97.97
(iii)	<b>Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 %</b> (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	123.00	124.23
(iv)	<b>Case - IV : Bitumen Impregnated Geotextile</b> (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	44.00	44.44
	<b>CHAPTER-6</b>			
	<b>CEMENT CONCRETE PAVEMENTS</b>			
6.1	<b>Dry Lean Cement Concrete Sub- base</b> (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	8960.00	9049.60
6.2	<b>Cement Concrete Pavement</b> (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	13628.00	13764.28
	<b>CHAPTER-8</b>			
	<b>TRAFFIC SIGNS, MARKINGS &amp; OTHER ROAD APPURTENANCES</b>			
8.1	<b>Cast in Situ Cement Concrete M20 kerb</b> (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	<b>Using Concrete Mixer</b>	metre	712.00	719.12
B	<b>Using Concrete Batching and Mixing Plant</b>	metre	702.00	709.02
8.2	<b>Cast in Situ Cement Concrete M 20 Kerb with Channel</b> (Construction of cement concrete kerb with channel with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M10 grade foundation 150 mm thick, kerb channel 300 mm wide, 50 mm thick in PCC M20 grade, sloped towards the kerb, kerb stone with channel laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408)			
A	<b>Using Concrete Mixer</b>	metre	1367.00	1380.67
B	<b>Using Concrete Batching and Mixing Plant</b>	metre	1360.00	1373.60
8.3	<b>Printing new letter and figures of any shade</b> (Printing new letter and figures of any shade with synthetic enamel paint black or any other approved colour to give an even shade)			
(i)	<b>Hindi</b> ( Matras commas and the like not to be measured and paid for Half letter shall be counted as half )	cm height per letter	1.10	1.11
(ii)	<b>English and Roman</b>	cm height per letter	0.70	0.71

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
8.4	<b>Retro- reflectorised Traffic signs</b> (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 )	<b>90 cm equilateral triangle</b>	each	6962.00	7031.62
( ii )	<b>60 cm equilateral triangle</b>	each	4895.00	4943.95
( iii )	<b>60 cm circular</b>	each	6248.00	6310.48
( iv )	<b>80 mm x 60 mm rectangular</b>	each	8346.00	8429.46
( v )	<b>60 cm x 45 cm rectangular</b>	each	6109.00	6170.09
( vi )	<b>60 cm x 60 cm square</b>	each	7068.00	7138.68
( vii )	<b>90 cm high octagon</b>	each	10391.00	10494.91
8.5	<b>Direction and Place Identification signs upto 0.9 sqm size board.</b> (Providing and erecting direction and place identification retro-reflectorised sign as per IRC:67 made of 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	14227.00	14369.27
8.6	<b>Direction and Place Identification signs with size more than 0.9 sqm size board.</b> (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	24829.00	25077.29
8.7	<b>Overhead Signs</b> (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	<b>Truss and Vertical Support</b>	tonne	60572.00	61177.72
B	<b>Aluminium alloy plate for over head sign</b>	tonne	11542.00	11657.42
8.8	<b>Painting Two Coats on New Concrete Surfaces</b> (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	87.00	87.87
8.9	<b>Painting on Steel Surfaces</b> (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	77.00	77.77
8.10	<b>Painting on Wood Surfaces</b> (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	85.00	85.85
8.11	<b>Painting Lines, Dashes, Arrows etc on Roads in Two Coats on New Work</b> (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)	<b>Over 10 cm in width</b>	sqm	141.00	142.41
(ii)	<b>Up to 10 cm in width</b>	sqm	121.00	122.21
8.12	<b>Painting Lines, Dashes, Arrows etc on Roads in Two Coats on Old Work</b> (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)	<b>Over 10 cm in width</b>	sqm	97.00	97.97
(ii)	<b>Up to 10 cm in width</b>	sqm	105.00	106.05
8.13	<b>Road Marking with Hot Applied Thermoplastic Compound with Reflectorising Glass Beads on Bituminous Surface</b> (Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes.)	sqm	851.00	859.51
8.14	<b>Kilo Metre Stone</b> (Reinforced cement concrete M15grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and printing etc)			
(i)	<b>5th kilometre stone (precast)</b>	each	6802.00	6870.02
(ii)	<b>Ordinary Kilometer stone (Precast)</b>	each	4336.00	4379.36
(iii)	<b>Hectometer stone (Precast)</b>	each	1016.00	1026.16
8.15	<b>Road Delineators</b> (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 toIRC-79 and the drawings.)	each	1081.00	1091.81
8.16	<b>Boundary pillar</b> (Reinforced cement concrete M15 grade boundary pillars of standard design as per IRC:25-1967, fixed in position including finishing and lettering but excluding painting)	each	1167.00	1178.67
8.17	<b>G.I Barbed wire Fencing 1.2 metre high</b> (Providing and fixing 1.2 metres high G.I 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 G.I staples, turn buckles etc complete as per clause 807 )	metre	319.00	322.19

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
8.18	<b>G.I Barbed wire Fencing 1.8 metre high</b> (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	539.00	544.39
8.20	<b>Tubular Steel Railing on Medium Weight steel channel ( ISMC series) 100 mm x 50 mm</b> (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	2720.00	2747.20
8.21	<b>Tubular Steel Railing on Precast RCC posts, 1.2 m high above ground level</b> (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	2282.00	2304.82
8.22	<b>Reinforced Cement Concrete Crash Barrier</b> (Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-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. RWNH - 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)	<b>M 20 grade concrete</b>	metre	6522.00	6587.22
8.23	<b>Metal Beam Crash Barrier</b>			
A	<b>Type - A, "W" : Metal Beam Crash Barrier</b> (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	3691.00	3727.91
B	<b>Type - B, "THRIE" : Metal Beam Crash Barrier</b> (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	4274.00	4316.74

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
	<b>CHAPTER-9</b>			
	<b>PIPE CULVERTS</b>			
9.1	<b>PCC 1:3:6 in Foundation</b> (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	10621.00	10727.21
9.2	<b>Laying Reinforced Cement Concrete Pipe NP4/prestrssed concrete pipe on first class bedding in single row .</b> (Laying Reinforced cement concrete pipe NP4/prestrssed 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 . )			
<b>A</b>	<b>1000 mm dia</b>	metre	4595.00	4640.95
<b>B</b>	<b>1200 mm dia</b>	metre	6294.00	6356.94
9.3	<b>Laying Reinforced Cement Concrete Pipe NP 4 /prestrssed concrete pipe on first class bedding in double row .</b> (Laying Reinforced cement concrete pipe NP4 /prestrssed 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 . )			
<b>A</b>	<b>1000 mm dia</b>	metre	9839.00	9937.39
<b>B</b>	<b>1200 mm dia</b>	metre	13283.00	13415.83

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
	<b>CHAPTER-12</b>			
	<b>FOUNDATIONS</b>			
12.1	<b>Excavation for Structures</b> (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)			
I	<b>Ordinary soil</b>			
A	<b>Manual Means</b>			
	(i) upto 3 m depth	cum	168.00	169.68
	(ii) 3 m to 6 m depth	cum	217.00	219.17
	(iii) Above 6 m depth	cum	289.00	291.89
B	<b>Mechanical Means</b>			
	(i) Depth upto 3 m	cum	66.00	66.66
	(ii) Depth 3 m to 6 m	cum	75.00	75.75
	(iii) Depth above 6m	cum	93.00	93.93
II	<b>Ordinary rock (not requiring blasting)</b>			
A	<b>Manual Means</b>			
	(i) Depth upto 3 m	cum	241.00	243.41
B	<b>Mechanical Means</b>	cum	83.00	83.83
III	<b>Hard rock ( requiring blasting )</b>			
A	<b>Manual Means</b>	cum	477.00	481.77
IV	<b>Hard rock ( blasting prohibited )</b>			
A	<b>Mechanical Means</b>	cum	534.00	539.34
V	<b>Marshy soil</b>			
	(i) upto 3 m depth			
A	<b>Manual means</b>	cum	630.00	636.30
B	<b>Mechanical Means</b>	cum	152.00	153.52
VI	<b>Back Filling in Marshy Foundation Pits</b>	cum	426.00	430.26
12.2	<b>Filling Annular Space Around Footing in Rock</b> (Lean cement concrete 1:3:6 nominal mix. Rate may be taken as per items 13.4.)			
12.3	<b>Sand Filling in Foundation Trenches as per Drawing &amp; Technical Specification</b>	cum	6701.00	6768.01
12.4	<b>PCC 1:3:6 in Foundation</b> (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	11771.00	11888.71
12.5	<b>Brick masonry work in cement mortar 1:3 in foundation complete excluding pointing and plastering, as per drawing and technical specifications</b>	cum	9331.00	9424.31
12.6 A	<b>Cement mortar1:3 (1cement :3 sand)</b>	cum	5550.00	5605.50
B	<b>Cement mortar1:2 (1cement :2 sand)</b>	cum	6619.00	6685.19
C	<b>Cement mortar1:4 (1cement :4 sand)</b>	cum	4834.00	4882.34
D	<b>Cement mortar1:6 (1cement :6 sand)</b>	cum	4245.00	4287.45
12.7	<b>Stone masonry work in cement mortar 1:3 in foundation complete as drawing and Technical Specification</b>			
	(a) <b>Square Rubble Coursed rubble masonry( first sort )</b>	cum	6589.00	6654.89
	(b) <b>Random Rubble Masonry</b>	cum	7101.00	7172.01
12.8	<b>Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications</b>			
A	<b>PCC Grade M15</b>	cum	13016.00	13146.16
B	<b>PCC Grade M20</b>	cum	13773.00	13910.73
C	<b>RCC Grade M20</b>			
	Case I <b>Using concrete mixer</b>	cum	13872.00	14010.72
	Case II <b>With Batching Plant, Transit Mixer and Concrete Pump</b>	cum	14006.00	14146.06
D	<b>PCC Grade M25</b>			
	Case I <b>Using concrete Mixer</b>	cum	14559.00	14704.59
	Case II <b>With Batching Plant, Transit Mixer and Concrete Pump</b>	cum	14699.00	14845.99
E	<b>RCC Grade M25</b>			
	Case I <b>Using concrete Mixer</b>	cum	14667.00	14813.67
	Case II <b>With Batching Plant, Transit Mixer and Concrete Pump</b>	cum	14801.00	14949.01
F	<b>PCC Grade M30</b>			
	Case I <b>Using Concrete Mixer</b>	cum	14612.00	14758.12
	Case II <b>Using Batching Plant, Transit Mixer and Concrete Pump</b>	cum	14743.00	14890.43
G	<b>RCC Grade M30</b>			
	Case I <b>Using Concrete Mixer</b>	cum	14681.00	14827.81
	Case II <b>Using Batching Plant, Transit Mixer and Concrete Pump</b>	cum	14817.00	14965.17
H	<b>RCC Grade M35</b>			
	Case I <b>Using Concrete Mixer</b>	cum	14835.00	14983.35
	Case II <b>Using Batching Plant, Transit Mixer and Concrete Pump</b>	cum	14971.00	15120.71
12.10	<b>Providing and laying cutting edge of mild steel weighing 40 kg per metre for well foundation complete as per</b>	tonne	111641.00	112757.41
12.11	<b>Plain/Reinforced cement concrete, in well foundation complete as per drawing and technical specification</b>			
12.40	<b>Supplying, fitting and placing un-coated HYSD bar reinforcement in foundation complete as per drawing and technical specifications</b>	tonne	72402.00	73126.02
12.41	<b>Supplying, fitting and placing un-coated Mild steel reinforcement complete in foundation as per drawing and technical specification</b>	tonne	82788.00	83615.88

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
	<b>CHAPTER-13</b>			
	<b>SUB-STRUCTURE</b>			
13.1	Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and technical specifications	cum	9392.00	9485.92
13.2	Pointing with cement mortar (1:3) on brick work in substructure as per Technical specifications	sqm	983.00	992.83
13.3	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical specifications	sqm	2539.00	2564.39
13.4	Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specifications			
A	Random Rubble Masonry	cum	8027.00	8107.27
B	Coursed rubble masonry (first sort )	cum	7369.00	7442.69
C	Ashlar masonry ( first sort )	cum	8406.00	8490.06
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	13768.00	13905.68
B	PCC Grade M20			
(p)	Height upto 5m	cum	14568.00	14713.68
C	PCC Grade M25			
(p)	Height upto 5m			
Case I	Using concrete Mixer	cum	15436.00	15590.36
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	15584.00	15739.84
(q)	Height 5m to 10m			
Case I	Using concrete Mixer	cum	15998.00	16157.98
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	16151.00	16312.51
(r)	Height above 10m			
Case I	Using concrete Mixer	cum	16699.00	16865.99
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	16859.00	17027.59
D	PCC Grade M30			
(p)	Height upto 5m			
Case I	Using concrete Mixer	cum	15531.00	15686.31
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	15670.00	15826.70
(q)	Height 5m to 10m			
Case I	Using concrete Mixer	cum	16095.00	16255.95
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	16240.00	16402.40
(r)	Height above 10m			
Case I	Using concrete Mixer	cum	16801.00	16969.01
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	16952.00	17121.52
E	RCC Grade M20			
(p)	Height upto 5m			
Case I	Using concrete Mixer	cum	14672.00	14818.72
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	14815.00	14963.15
(q)	Height 5m to 10m			
Case I	Using concrete Mixer	cum	15206.00	15358.06
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	15353.00	15506.53
(r)	Height above 10m			
Case I	Using concrete Mixer	cum	15873.00	16031.73
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	16027.00	16187.27
F	RCC Grade M25			
(p)	Height upto 5m			
Case I	Using concrete Mixer	cum	15551.00	15706.51
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	16063.00	16223.63
(q)	Height 5m to 10m			
Case I	Using concrete Mixer	cum	16060.00	16220.60
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	16589.00	16754.89
(r)	Height above 10m			
Case I	Using concrete Mixer	cum	16823.00	16991.23
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	17378.00	17551.78
G	RCC Grade M30			
(p)	Height upto 5m			
Case I	Using concrete Mixer	cum	15603.00	15759.03
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	15748.00	15905.48
(q)	Height 5m to 10m			
Case I	Using concrete Mixer	cum	16043.00	16203.43
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	16192.00	16353.92
(r)	Height above 10m			
Case I	Using concrete Mixer	cum	16667.00	16833.67
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	16822.00	16990.22
H	RCC Grade M35			
(p)	Height upto 5m			

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
Case I	Using concrete Mixer	cum	15844.00	16002.44
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	16376.00	16539.76
(q)	Height 5m to 10m			
Case I	Using concrete Mixer	cum	16190.00	16351.90
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	16733.00	16900.33
(r)	Height above 10m			
Case I	Using concrete Mixer	cum	16708.00	16875.08
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	17269.00	17441.69
13.6	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	tonne	72604.00	73330.04
13.7	Supplying, fitting and placing Mild steel reinforcement complete in sub-structure as per drawing and technical specification	tonne	81769.00	82586.69
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	153.00	154.53
13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification			
A	Granular material	cum	3565.00	3600.65
B	Sandy material	cum	7033.00	7103.33
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	2733.00	2760.33
	<b>CHAPTER-14</b>			
	<b>SUPER-STRUCTURE</b>			
14.1	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			
(i)	For solid slab super-structure, 20-30% of (a+b+c)			
(p)	Height upto 5m	cum	15904.00	16063.04
(q)	Height 5m to 10m	cum	16566.00	16731.66
(r)	Height above 10m	cum	17229.00	17401.29
(ii)	For T-beam & slab, 25-35% of (a+b+c)			
(p)	Height upto 5m	cum	16566.00	16731.66
(q)	Height 5m to 10m	cum	17229.00	17401.29
(r)	Height above 10m	cum	17892.00	18070.92
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	16056.00	16216.56
(q)	Height 5m to 10m	cum	16725.00	16892.25
(r)	Height above 10m	cum	17394.00	17567.94
(ii)	For T-beam & slab, 25-35% of (a+b+c)			
(p)	Height upto 5m	cum	16725.00	16892.25
(q)	Height 5m to 10m	cum	17394.00	17567.94
(r)	Height above 10m	cum	18063.00	18243.63
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	16896.00	17064.96
(q)	Height 5m to 10m	cum	17600.00	17776.00
(r)	Height above 10m	cum	18304.00	18487.04
(ii)	For T-beam & slab, 25-35% of (a+b+c)			
(p)	Height upto 5m	cum	17600.00	17776.00
(q)	Height 5m to 10m	cum	18304.00	18487.04
(r)	Height above 10m	cum	19008.00	19198.08
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	17039.00	17209.39
(q)	Height 5m to 10m	cum	17749.00	17926.49
(r)	Height above 10m	cum	18459.00	18643.59
(ii)	For T-beam & slab, 25-35% of (a+b+c)			
(p)	Height upto 5m	cum	17749.00	17926.49
(q)	Height 5m to 10m	cum	18459.00	18643.59
(r)	Height above 10m	cum	19169.00	19360.69
C	RCC Grade M 30			
Case I	Using Concrete Mixer			

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
(i)	<i>For solid slab super-structure, 20-30% of (a+b+c)</i>			
(p)	Height upto 5m	cum	17060.00	17230.60
(q)	Height 5m to 10m	cum	17771.00	17948.71
(r)	Height above 10m	cum	18481.00	18665.81
(ii)	<i>For T-beam &amp; slab, 25-35% of (a+b+c)</i>			
(p)	Height upto 5m	cum	17771.00	17948.71
(q)	Height 5m to 10m	cum	18481.00	18665.81
(r)	Height above 10m	cum	19192.00	19383.92
<b>Case II</b>	<b>Using Batching Plant, Transit Mixer and Concrete Pump.</b>			
(i)	<i>For solid slab super-structure, 20-30% of (a+b+c)</i>			
(p)	Height upto 5m	cum	17216.00	17388.16
(q)	Height 5m to 10m	cum	17934.00	18113.34
(r)	Height above 10m	cum	18651.00	18837.51
(ii)	<i>For T-beam &amp; slab, 25-35% of (a+b+c)</i>			
(p)	Height upto 5m	cum	17934.00	18113.34
(q)	Height 5m to 10m	cum	18651.00	18837.51
(r)	Height above 10m	cum	19369.00	19562.69
<b>D</b>	<b>RCC/PSC Grade M35</b>			
<b>Case 1</b>	<b>Using concrete mixer.</b>			
(i)	<i>For solid slab super-structure, 18-28% of (a+b+c)</i>			
(p)	Height upto 5m	cum	17033.00	17203.33
(q)	Height 5m to 10m	cum	17755.00	17932.55
(r)	Height above 10m	cum	18477.00	18661.77
(ii)	<i>For T-beam &amp; slab, 23-33% of (a+b+c)</i>			
(p)	Height upto 5m	cum	17755.00	17932.55
(q)	Height 5m to 10m	cum	18477.00	18661.77
(r)	Height above 10m	cum	19199.00	19390.99
(iii)	<i>For box girder and balanced cantilever, 38-58% of cost of concrete.</i>			
(p)	Height upto 5m	cum	19920.00	20119.20
(q)	Height 5m to 10m	cum	21364.00	21577.64
(r)	Height above 10m	cum	22807.00	23035.07
<b>Case II</b>	<b>Using Batching Plant, Transit Mixer and Concrete Pump</b>			
(i)	<i>For solid slab super-structure, 18-28% of (a+b+c)</i>			
(p)	Height upto 5m	cum	17155.00	17326.55
(q)	Height 5m to 10m	cum	17882.00	18060.82
(r)	Height above 10m	cum	18609.00	18795.09
(ii)	<i>For T-beam &amp; slab, 23-33% of (a+b+c)</i>			
(p)	Height upto 5m	cum	17882.00	18060.82
(q)	Height 5m to 10m	cum	18609.00	18795.09
(r)	Height above 10m	cum	19336.00	19529.36
(iii)	<i>For box girder and balanced cantilever, 38-58% of cost of concrete.</i>			
(p)	Height upto 5m	cum	20063.00	20263.63
(q)	Height 5m to 10m	cum	21517.00	21732.17
(r)	Height above 10m	cum	22971.00	23200.71
<b>E</b>	<b>PSC Grade M-40</b>			
<b>Case 1</b>	<b>Using concrete mixer.</b>			
(i)	<i>For solid slab super-structure, 20-30% of (a+b+c)</i>			
(p)	Height upto 5m	cum	17955.00	18134.55
(q)	Height 5m to 10m	cum	18703.00	18890.03
(r)	Height above 10m	cum	19451.00	19645.51
(ii)	<i>For T-beam &amp; slab, 25-35% of (a+b+c)</i>			
(p)	Height upto 5m	cum	18703.00	18890.03
(q)	Height 5m to 10m	cum	19451.00	19645.51
(r)	Height above 10m	cum	20199.00	20400.99
<b>Case II</b>	<b>Using Batching Plant, Transit Mixer and Concrete Pump</b>			
(i)	<i>For solid slab super-structure, 18-28% of (a+b+c)</i>			
(p)	Height upto 5m	cum	17721.00	17898.21
(q)	Height 5m to 10m	cum	18472.00	18656.72
(r)	Height above 10m	cum	19223.00	19415.23
(ii)	<i>For T-beam &amp; slab, 23-33% of (a+b+c)</i>			
(p)	Height upto 5m	cum	18472.00	18656.72
(q)	Height 5m to 10m	cum	19223.00	19415.23
(r)	Height above 10m	cum	19974.00	20173.74
(iii)	<i>For box girder and balanced cantilever, 38-58% of cost of concrete.</i>			
(p)	Height upto 5m	cum	20725.00	20932.25
(q)	Height 5m to 10m	cum	22227.00	22449.27
(r)	Height above 10m	cum	23729.00	23966.29

### Summary of Rate Analysis

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
14.2	a) <b>Supplying, fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications</b>	tonne	74146.00	74887.46
14.4	<b>Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications</b>	cum	19977.00	20176.77
14.5	<b>Mastic Asphalt</b> (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	339.00	342.39
14.6	<b>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.</b>	metre	2751.00	2778.51
14.7	<b>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.</b>	metre	2706.00	2733.06
14.8	<b>Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification</b>	metre	4026.00	4066.26
14.9	<b>Drainage Spouts complete as per drawing and Technical specification</b>	each	1000.00	1010.00
14.10	<b>PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification</b>	cum	12516.00	12641.16
14.11	<b>Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification</b>	cum	18310.00	18493.10
14.12	<b>Providing anti-corrosive treatment to HYSD reinforcement with Fusion Bonded Epoxy Coating (FBEC)</b> (To be taken as per the prevailing market rates.)	tonne		0.00
14.14	<b>Providing and fixing Helical pipes in voided concrete slabs</b>	metre	125.00	126.25
14.15	<b>Crash Barriers</b> (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	<b>Painting on concrete surface</b> (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	56.00	56.56
14.17	<b>Burried Joint</b> (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.)	metre	1041.00	1051.41
14.18	<b>Filler joint</b>			
(i)	<b>Providing &amp; fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing &amp; Technical Specification.</b>	metre	48.00	48.48
(ii)	<b>Providing &amp; fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing &amp; Technical Specification.</b>	metre	10.00	10.10
(iii)	<b>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.</b>	metre	405.00	409.05
(iv)	<b>Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight</b>	metre	30.00	30.30
14.19	<b>Asphaltic Plug joint</b> (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	439.00	443.39
14.20	<b>Elastomeric Slab Steel Expansion Joint</b> (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	68.00	68.68
14.22	<b>Strip Seal Expansion Joint</b> (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	11710.00	11827.10
14.23	<b>Modular Strip / Box Seal Joint</b> (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	62.00	62.62
14.24	<b>Modular Strip / Box Seal Joint</b> (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	78.00	78.78

**Summary of Rate Analysis**

Item No.	Descriptions	Unit	Rate	Rate (with Labour cess)
	<b>CHAPTER-15</b>			
	<b>RIVER TRAINING AND PROTECTION WORKS</b>			
15.1	<b>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.</b>			
A	<b>Boulder laid dry without wire crates.</b>	cum	3928.00	3967.28
15.2	<b>Boulder apron laid in wire crates</b> (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	4281.00	4323.81
15.3	<b>Cement concrete blocks (size 0.5 x 0.5 x 0.5 m)</b> (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	13276.00	13408.76
15.4	<b>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</b>			
A	<b>Stone/Boulder</b>	cum	3928.00	3967.28
B	<b>Cement Concrete blocks of size 0.3x0.3 x0.3 m cast in cement concrete of Grade M15</b>	cum	13276.00	13408.76
15.5	<b>Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification</b>	cum	2976.00	3005.76
15.6	<b>Geotextile Filter</b> (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	21.00	21.21
15.7	<b>Toe protection</b> (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	<b>Providing and laying Flooring complete as per drawing and Technical specifications laid over cement concrete bedding.</b>			
A	<b>Rubble stone laid in cement mortar 1:3</b>	cum	12090.00	12210.90
B	<b>Cement Concrete blocks Grade M15</b>	cum	17484.00	17658.84

### CARRIAGE COST

Sl. No.	Name of Materials	Unit	Source	Gross Tipper Capacity per trip	Multiplying factor	Net Tipper capacity (Payble quantity) per trip	Loading & Unloading into Truck	Loading & Unloading at Port	Shipping Charges	Cost of Haulage Per cum			Lead in km			Carriage Cost = $\{8/N_c[(H_s \cdot L_s) + (H_g \cdot L_g) + (H_k \cdot L_k)]\} + \text{Loading \& Unloading}$
						N <sub>c</sub>				For Surface Road	For Graveled Road	For Katcha Track & Track in River Bed	For Surface Road	For Graveled Road	For Katcha Track & Track in River Bed	
										H <sub>s</sub>	H <sub>g</sub>	H <sub>k</sub>	L <sub>s</sub>	L <sub>g</sub>	L <sub>k</sub>	
1	2	3	4	5	6	7	8			9	10	11	12	13	14	15
1	Lime , Moorum, Building Rubbish, Earth, Manure or Sludge and Excavated Rocks	Cum	Rates applicable on compacted volume													
i)	Moorum	Cum	Panchwati	6.0	1.00	6.00	78.00	0.00	0.00	2.48	3.00	6.00	75.00	-	1.00	334.00
ii)	Screening Material	Cum	Panchwati	6.0	1.00	6.00	78.00	0.00	0.00	2.48	3.00	6.00	75.00	-	1.00	334.00
iii)	Earth	Cum	Local	6.0	0.80	4.80	78.00	0.00	0.00	2.48	3.00	6.00	5.00	-	-	98.67
2	Sand Stone agreegate and Soling Stone															
i)	Sand	Cum	Brookshabad	5.4	0.92	4.99	156.00	70.20	2575.11	2.48	3.00	6.00	45.00	-	1.00	2989.86
ii)	Stone Agreegate (WMM, DBM & BC)	Cum	Brookshabad	5.4	0.85	4.59	156.00	70.20	2575.11	2.48	3.00	6.00	45.00	-	1.00	3006.27
ii)	Stone Agreegate (GSB)	Cum	Panchwati	5.4	0.85	4.59	78.00	0.00	0.00	2.48	3.00	6.00	75.00	-	1.00	412.64
iii)	Boulder	Cum	Panchwati	6.0	0.80	4.80	104.00	0.00	0.00	2.48	3.00	6.00	75.00	-	1.00	424.00
3	Cement ,stone blocks, G.I., C.I., A.C. & C.C. pipes below 100 mm dia and other heavy materials	MT	Portblair	8.0	1.00	8.00	478.00	70.20	2580.83	2.48	3.00	6.00	45.00	-	-	3240.63
4	Steel	MT	Kolkata	8.0	1.00	8.00	478.00	70.20	3673.05	2.48	3.00	6.00	45.00	-	-	4332.85
5	Bitumen	MT	Haldia	8.0	1.00	8.00	478.00	70.20	3673.05	2.48	3.00	6.00	163.00	-	-	4625.49

CHAPTER-1(B)					
LOADING, UNLOADING, STACKING & CARRIAGE OF DIFFERENT MATERIALS BY					
SL No	Description of Item	Unit	Source	Lead in km	Carriage Cost
1	2	3	17	18	19
1 (a)	Sand, Moorum, Lime, Surki, Cinder and similar granular materials	Cum		75	334.00
	Coarse Sand/Medium Sand/Fine Sand	Cum		50	2989.86
	Earth	Cum		5	98.67
1 (b)	Stone Agreagate, Stone Chips, Gravels, Shingles,	Cum		75	3006.27
1 (b)	Stone Agreagate, Stone Chips, Gravels, Shingles,	Cum		75	412.64
1 (c)	Boulders	Cum		75	424.00
2	Cement (In bags)	M.T		45	3240.63
3	Bitumen	M.T		40	4625.49
4	Heavy Steel Section (RSJ Above 460x150 mm) & Structural Steel bars Having Length more then 7.50m	M.T		40	4332.85

- Note:**
1. For carriage on unsurface gravelled road: 20% extra over the corresponding rates as above.
  2. For carriage on Kutcha road and river bed: 30% extra over the corresponding rates as above.
  3. For carriage in hill areas having altitude 460m and more above MSL: 70% extra over the corresponding rates as above.
  4. The above Rates includes all charges, royalty etc. but exclude Overhead charges & Contractor's profit.

**CARRIAGE CALCULATION CHART BY FREIGHT (THE INDIAN COASTAL CONFERENCE)**

Sl. No	Name of Materials	Source	Unit	Freight Charge	Service tax including Swachh Bharat (14.5%)	Octroi Charges (3%)	Carriage Cost =	Remarks
1	2	3	4	5	6=5*14.5%	7=5*3.0%	8=5+6+7	
1	General Cargo	Vizag, Chennai & Kolkata to Mayabundar	CBM	2919	423.26	87.57	3429.83	
			Tonnes	3126	453.27	93.78	3673.05	
2	Dangerous Cargo		CBM	5839	846.66	175.17	6860.83	
			Tonnes	6250	906.25	187.50	7343.75	
3	General Cargo	Portblair to Myabundar	CBM	2249	326.11	0.00	2575.11	
			Tonnes	2285	331.33	0.00	2616.33	
5	Cement		Tonnes	2254	326.83	0.00	2580.83	

CHAPTER-1							
CARRIAGE OF MATERIALS							
Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
1.1		<b>Loading and Unloading of Stone Boulder/Stone aggregates/Sand/Kanker/Moorum.</b>	cum				
		Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip					
		<b>Unit = cum</b>					
		<b>Taking output = 5.5 cum</b>					
		<b>Time required for</b>					
		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			
		<b>Total</b>		<b>20 Min</b>			
		<b>a) Machinery</b>					
		Tipper 5.5 tonnes capacity	hour	0.330	360.00	118.80	P&M-048
		Front end-loader 1 cum bucket capacity @ 25 cum/hour	hour	0.330	936.00	308.88	P&M-017
		Cost for 5.5 cum = a+b+c				427.68	
		<b>Rate per cum = (a+b+c)/ 5.5</b>				77.76	
		<b>Note Unloading will be by tipping.</b>			<b>say</b>	<b>78.00</b>	
1.2		<b>Loading and Unloading of Boulders by Manual Means</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 5.5 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.110	365.00	40.15	L-12
		Mazdoor for loading and unloading	day	0.750	350.00	262.50	L-13
		<b>b) Machinery</b>					
		Tipper 5.5 tonne capacity	hour	0.750	360.00	270.00	P&M-048
		Cost for 5.5 cum = a+b+c+d				572.65	
		<b>Rate per cum = (a+b+c+d)/5.5</b>				104.12	
		<b>Note Unloading will be by tipping.</b>			<b>say</b>	<b>104.00</b>	
1.3		<b>Loading and Unloading of Cement or Steel by Manual Means and Stacking.</b>					
		<b>Unit = tonne</b>					
		<b>Taking output = 10 tonnes</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	365.00	29.20	L-12
		Mazdoor for loading and unloading	day	2.000	350.00	700.00	L-13
		<b>b) Machinery</b>					
		Truck 10 tonne capacity	hour	2.000	832.59	1665.18	P&M-057
		Cost for 10 tonnes = a+b+c+d				2394.38	
		<b>Rate per tonnes = (a+b+c+d)/10</b>				239.44	
					<b>say</b>	<b>239.00</b>	
1.4		<b>Cost of Haulage Excluding Loading and Unloading</b>					
		Haulage of materials by tipper excluding cost of loading, unloading and stacking.					
		<b>Unit = t.km</b>					
		<b>Taking output 10 tonnes load and lead 10 km = 100 t.km</b>					
		<b>(i) Surfaced Road</b>					
		Speed with load : 25 km / hour.					
		Speed while Returning empty :35 km / hour.					
		<b>a) Machinery.</b>					
		Tipper 10 tonne capacity					
		Time taken for onward haulage with load	hour	0.400	360.00	144.00	P&M-048
		Time taken for empty return trip.	hour	0.290	360.00	104.40	P&M-048
		cost for 100 t km = a+b+c				248.40	
		<b>Rate per t.km = (a+b+c)/100</b>				2.48	
					<b>say</b>	<b>2.48</b>	
1.4		<b>(ii) Unsurfaced Graveled Road</b>					
		Speed with load: 20 km / hour					
		Speed for empty return trip :30 km / hour					
		<b>a) Machinery</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Tipper 10 tonnes capacity</b>					
		Time taken for onward haulage with load	hour	0.500	360.00	180.00	P&M-048
		Time taken for empty return trip	hour	0.330	360.00	118.80	P&M-048
		Cost for 100 t .km = a+b+c				298.80	
		Rate per t.Km = (a+b+c)/100				2.99	
					say	<u>3.00</u>	
1.4	(iii)	<b>Katcha Track and Track in River Bed/Nallah Bed and Choe Bed.</b>					
		Speed with load :10 km / hour					
		Speed while returning empty:15 km / hour					
		<b>a) Machinery</b>					
		<b>Tipper 10 tonnes capacity</b>					
		Time taken for onward haulage	hour	1.000	360.00	360.00	P&M-048
		Time taken for empty return trip	hour	0.670	360.00	241.20	P&M-048
		Cost for 100 t .km = a+b+c				601.20	
		<b>Rate per t.Km = (a+b+c)/100</b>				6.01	
					say	<u>6.00</u>	
1.5		<b>Hand Broken Stone Aggregates 63 mm Nominal Size</b>					
		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					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.060	365.00	21.90	L-12
		Mazdoor	day	1.500	350.00	525.00	L-13
		<b>b) Material</b>					
		Supply of quarried stone 150 - 200 mm size	cum	1.100	4688.27	5157.10	M-002
		<b>Rate per cum = a+b+c+d</b>				5704.00	
					say	<u>5704.00</u>	
1.6		<b>Crushing of Stone Aggregates 13.2 mm Nominal Size.</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking Output = 600 cum at crusher location.</b>					
		<b>a) Labour</b>					
		Mate	day	0.760	365.00	277.40	L-12
		Mazdoor Skilled	day	2.000	420.00	840.00	L-14
		Mazdoor including breaking of any oversize boulder.	day	17.000	350.00	5950.00	L-13
		<b>b) Material</b>					
		Stone Boulder of size 150 mm and below	cum	800.000	2106.00	1684800.00	M-001
		<b>c) Machinery</b>					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	21168.00	127008.00	P&M-028
		Front end loader 1 cum bucket capacity	Hour	20.000	936.00	18720.00	P&M-017
		Tipper 5.5 cum capacity	Hour	20.000	360.00	7200.00	P&M-048
		Cost for 600 cum = (a+b+c+d+e)x0.95				1844795.40	
		<b>Rate per cum = (a+b+c+d+e)*0.95/600</b>				2920.93	
					say	<u>2921.00</u>	
	<b>Note</b>	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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
1.7		<b>Crushing of Stone Aggregates 20 mm Nominal Size</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking Output = 670 cum at crusher location.</b>					
		<b>a) Labour</b>					
		Mate	day	0.760	365.00	277.40	L-12
		Mazdoor Skilled	day	2.000	420.00	840.00	L-14
		Mazdoor including breaking of any size boulder.	day	17.000	350.00	5950.00	L-13
		<b>b) Material</b>					
		Stone Boulder of size 150 mm and below	cum	800.000	2106.00	1684800.00	M-001
		<b>c) Machinery</b>					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	21168.00	127008.00	P&M-028
		Front end loader 1 cum bucket capacity	Hour	20.000	936.00	18720.00	P&M-017
		Tipper 5.5 cum capacity	Hour	20.000	360.00	7200.00	P&M-048
		Cost for 670 cum = (a+b+c+d+e)x0.90				1844795.40	
		<b>Rate per cum = (a+b+c+d+e)*0.90/670</b>				<b>2478.08</b>	
					<b>say</b>	<b>2478.00</b>	
		<b>Note</b>					
		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		<b>Crushing of Stone Aggregates 40 mm Nominal Size</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking Output = 750 cum at crusher location.</b>					
		<b>a) Labour</b>					
		Mate	day	0.760	365.00	277.40	L-12
		Mazdoor Skilled	day	2.000	420.00	840.00	L-14
		Mazdoor	day	17.000	350.00	5950.00	L-13
		<b>b) Material</b>					
		Stone Boulder of size 150 mm and below	cum	800.000	2106.00	1684800.00	M-001
		<b>c) Machinery</b>					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	21168.00	127008.00	P&M-028
		Front end loader 1 cum bucket capacity	Hour	20.000	936.00	18720.00	P&M-017
		Tipper 5.5 cum capacity	Hour	20.000	360.00	7200.00	P&M-048
		Cost for 750 cum = (a+b+c+d+e)x0.85				1568076.09	
		<b>Rate per cum = (a+b+c+d+e)x0.85/750</b>				<b>2090.77</b>	
					<b>say</b>	<b>2091.00</b>	
		<b>Note</b>					
		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	<b>Cutting of Trees, including cutting of Trunks, Branches and Removal</b>					
		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.					
		<b>Unit = Each</b>					
		<b>(i) Girth from 300 mm to 600 mm</b>					
		<b>a) Labour</b>					
		Mate	day	0.020	365.00	7.30	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	0.600	350.00	210.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.100	421.20	42.12	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				20.75	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				28.02	
		<b>Rate for each tree = a+b+c+d</b>				308.19	
						<b>say 308.00</b>	
2.1		<b>(ii) Girth from 600 mm to 900 mm</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	365.00	14.60	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	350.00	315.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.300	421.20	126.36	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				36.48	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				49.24	
		<b>Rate for each tree = a+b+c+d</b>				541.68	
						<b>say 542.00</b>	
2.1		<b>(iii) Girth from 900 mm to 1800 mm</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	365.00	29.20	L-12
		Mazdoors for cutting trees including cutting, refilling, compaction of backfilling and stacking of serviceable materials within 1000 metres	day	2.000	350.00	700.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.400	421.20	168.48	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				71.81	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				96.95	
		<b>Rate for each tree = a+b+c+d</b>				1066.44	
						<b>say 1066.00</b>	
2.1		<b>(iv) Girth above 1800 mm</b>					
		<b>a) Labour</b>					
		Mate	day	0.160	365.00	58.40	L-12
		Mazdoors for cutting trees including cutting, refilling, compaction of backfilling and stacking of serviceable materials within 1000 metres	day	4.000	350.00	1400.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.600	421.20	252.72	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				136.89	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				184.80	
		<b>Rate for each tree = a+b+c+d</b>				2032.81	
						<b>say 2033.00</b>	
2.2	201	<b>Clearing Grass and Removal of Rubbish</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Clearing grass and removal of rubbish up to a distance of 50 metres outside the periphery of the area .					
		<b>By Manual Means</b>					
		<b>Unit = Hectare</b>					
		<b>Taking output = 1 Hectare</b>					
		<b>a) Labour</b>					
		Mate	day	2.000	365.00	730.00	L-12
		Mazdoor	day	50.000	350.00	17500.00	L-13
		<b>b) Overhead charges @ 08% on (a)</b>				1458.40	
		<b>c) Contractor's profit @ 10% on (a+b)</b>				1968.84	
		<b>Rate per Hectare = a+b+c</b>				21657.24	
					<b>say</b>	<b>21657.00</b>	
<b>2.3</b>	<b>201</b>	<b>Clearing and Grubbing Road Land .</b>					
		Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned, up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.					
		<b>Unit = Hectare</b>					
		<b>Taking output = 1 Hectare</b>					
		<b>(i) By Manual Means:-</b>					
		<b>A In area of light jungle</b>					
		<b>a) Labour</b>					
		Mate	day	6.000	365.00	2190.00	L-12
		Mazdoor	day	150.000	350.00	52500.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	1.000	421.20	421.20	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				4408.90	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				5952.01	
		<b>Rate per Hectare = a+b+c+d</b>				65472.11	
					<b>say</b>	<b>65472.00</b>	
<b>2.3 (i)</b>		<b>B In area of thorny jungle</b>					
		<b>a) Labour</b>					
		Mate	day	8.000	365.00	2920.00	L-12
		Mazdoor	day	200.000	350.00	70000.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	2.000	421.20	842.40	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				5900.99	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				7966.34	
		<b>Rate per Hectare = a+b+c+d</b>				87629.73	
					<b>say</b>	<b>87630.00</b>	
<b>2.3</b>		<b>(ii) By Mechanical Means</b>					
		<b>A In area of light jungle</b>					
		<b>a) Labour</b>					
		Mate	day	0.160	365.00	58.40	L-12
		Mazdoor	day	4.000	350.00	1400.00	L-13
		<b>b) Machinery</b>					
		Dozer 80 HP with attachment for removal of trees & stumps	hour	10.000	4320.00	43200.00	P&M-014
		Tractor-trolley	hour	1.000	421.20	421.20	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				3606.37	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				4868.60	
		<b>Rate per Hectare = a+b+c+d</b>				53554.56	
					<b>say</b>	<b>53555.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.3 (ii)		B	In area of thorny jungle					
		a)	Labour					
			Mate	day	0.240	365.00	87.60	L-12
			Mazdoor	day	6.000	350.00	2100.00	L-13
		b)	Machinery					
			Dozer 80 HP with attachment for removal of trees & stumps	hour	12.000	4320.00	51840.00	P&M-014
			Tractor-trolley	hour	1.500	421.20	631.80	P&M-053
		c)	Overhead charges @ 08% on (a+b)				4372.75	
		d)	Contractor's profit @ 10% on (a+b+c)				5903.22	
			Rate per Hectare = a+b+c+d				64935.37	
						say	<u>64935.00</u>	
2.4	202		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>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	365.00	14.60	L-12
			Mazdoor for dismantling and loading	day	1.000	350.00	350.00	L-13
		b)	Machinery					
			Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		c)	Overhead charges @ 08% on (a+b)				38.27	
		d)	Contractor's profit @ 10% on (a+b+c)				51.66	
			Cost for 1.25 cum = a+b+c+d				568.25	
			Rate per cum = (a+b+c+d)/ 1.25				454.60	
						say	<u>455.00</u>	
2.4 (i)		B	Cement Concrete Grade M-15 & M-20					
		a)	Labour					
			Mate	day	0.050	365.00	18.25	L-12
			Mazdoor for dismantling and loading	day	1.250	350.00	437.50	L-13
		b)	Machinery					
			Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		c)	Overhead charges @ 08% on (a+b)				45.56	
		d)	Contractor's profit @ 10% on (a+b+c)				61.50	
			Cost for 1.25 cum = a+b+c+d				676.54	
			Rate per cum = (a+b+c+d)/ 1.25				541.23	
						say	<u>541.00</u>	
2.4 (i)		C	Prestressed / Reinforced cement concrete grade M-20 & above					
		a)	Labour					
			Mate	day	0.150	365.00	54.75	L-12
			Blacksmith	day	0.250	490.00	122.50	L-02
			Mazdoor for dismantling, loading and unloading	day	3.500	350.00	1225.00	L-13
		b)	Machinery					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		c) Overhead charges @ 08% on (a+b)				121.28	
		d) Contractor's profit @ 10% on (a+b+c)				163.73	
		Cost for 1.25 cum = a+b+c+d				1800.98	
		Rate per cum = (a+b+c+d)/ 1.25				1440.78	
					say	<u>1441.00</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	365.00	7.30	L-12
		Mazdoor for loading and unloading	day	0.250	350.00	87.50	L-13
		Mazdoor with Pneumatic breaker	day	0.250	420.00	105.00	L-14
	b)	Machinery					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1.5 cum per hour	hour	0.670	370.80	248.44	P&M-001
		Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		c) Overhead charges @ 08% on (a+b)				44.96	
		d) Contractor's profit @ 10% on (a+b+c)				60.69	
		Cost for 1.25 cum = a+b+c+d				667.61	
		Rate per cum = (a+b+c+d)/ 1.25				534.09	
					say	<u>534.00</u>	
2.4 II	B	Prestressed / reinforced cement concrete grade M-20 & above					
	a)	Labour					
		Mate	day	0.050	365.00	18.25	L-12
		Mazdoor with Pneumatic breaker	day	0.660	420.00	277.20	L-14
		Blacksmith	day	0.250	490.00	122.50	L-02
		Mazdoor for loading and unloading	day	0.250	350.00	87.50	L-13
	b)	Machinery					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1.00 cum per hour	hour	1.000	370.80	370.80	P&M-001
		Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		c) Overhead charges @ 08% on (a+b)				79.20	
		d) Contractor's profit @ 10% on (a+b+c)				106.92	
		Cost for 1.25 cum = a+b+c+d				1176.09	
		Rate per cum = (a+b+c+d)/ 1.25				940.87	
					say	<u>941.00</u>	
2.4	(ii)	Dismantling Brick / Tile work					
	A	In lime mortar					
	a)	Labour					
		Mate	day	0.020	365.00	7.30	L-12
		Mazdoor for dismantling, loading and unloading	day	0.500	350.00	175.00	L-13
	b)	Machinery					
		Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		c) Overhead charges @ 08% on (a+b)				23.68	
		d) Contractor's profit @ 10% on (a+b+c)				31.97	
		Cost for 1.25 cum = a+b+c+d				351.68	
		Rate per cum = (a+b+c+d)/ 1.25				281.34	
					say	<u>281.00</u>	
2.4 (ii)	B	In cement mortar					
	a)	Labour					
		Mate	day	0.030	365.00	10.95	L-12
		Mazdoor for dismantling, loading and unloading	day	0.750	350.00	262.50	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				30.97	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				41.81	
		Cost for 1.25 cum = a+b+c+d				459.96	
		<b>Rate per cum = (a+b+c+d)/ 1.25</b>				367.97	
					<b>say</b>	<b>368.00</b>	
2.4 (ii)		<b>C In mud mortar</b>					
		<b>a) Labour</b>					
		Mate	day	0.016	365.00	5.84	L-12
		Mazdoor for dismantling and loading	day	0.400	350.00	140.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				20.77	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				28.03	
		Cost for 1.25 cum = a+b+c+d				308.36	
		<b>Rate per cum = (a+b+c+d)/ 1.25</b>				246.69	
					<b>say</b>	<b>247.00</b>	
2.4 (ii)		<b>D Dry brick pitching or brick soling</b>					
		<b>a) Labour</b>					
		Mate	day	0.014	365.00	5.11	L-12
		Mazdoor for Dismantling, loading and unloading	day	0.350	350.00	122.50	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				19.31	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				26.06	
		Cost for 1.25 cum = a+b+c+d				286.70	
		<b>Rate per cum = (a+b+c+d)/ 1.25</b>				229.36	
					<b>say</b>	<b>229.00</b>	
2.4		<b>(iii) Dismantling Stone Masonry</b>					
		<b>A Rubble stone masonry in lime mortar</b>					
		<b>a) Labour</b>					
		Mate	day	0.024	365.00	8.76	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.600	350.00	210.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				26.60	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				35.91	
		Cost for 1.25 cum = a+b+c+d				394.99	
		<b>Rate per cum = (a+b+c+d)/ 1.25</b>				315.99	
					<b>say</b>	<b>316.00</b>	
2.4 (iii)		<b>B Rubble stone masonry in cement mortar.</b>					
		<b>a) Labour</b>					
		Mate	day	0.030	365.00	10.95	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.750	350.00	262.50	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				30.97	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				41.81	
		Cost for 1.25 cum = a+b+c+d				459.96	
		<b>Rate per cum = (a+b+c+d)/ 1.25</b>				367.97	
					<b>say</b>	<b>368.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.4 (iii)		<b>C Rubble Stone Masonry in mud mortar.</b>					
		<b>a) Labour</b>					
		Mate	day	0.020	365.00	7.30	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.500	350.00	175.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				23.68	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				31.97	
		Cost for 1.25 cum = a+b+c+d				351.68	
		<b>Rate per cum = (a+b+c+d)/ 1.25</b>				281.34	
					say	<b>281.00</b>	
2.4 (iii)		<b>D Dry rubble masonry</b>					
		<b>a) Labour</b>					
		Mate	day	0.018	365.00	6.57	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.450	350.00	157.50	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				22.22	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				30.00	
		Cost for 1.25 cum = a+b+c+d				330.02	
		<b>Rate per cum = (a+b+c+d)/ 1.25</b>				264.02	
					say	<b>264.00</b>	
2.4 (iii)		<b>E Dismantling stone pitching/ dry stone spalls.</b>					
		<b>a) Labour</b>					
		Mate	day	0.016	365.00	5.84	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.400	350.00	140.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.270	421.20	113.72	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				20.77	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				28.03	
		Cost for 1.25 cum = a+b+c+d				308.36	
		<b>Rate per cum = (a+b+c+d)/ 1.25</b>				246.69	
					say	<b>247.00</b>	
2.4		<b>(ix) Removing all type of Hume Pipes and Stacking within a lead of 1000 metres including Earthwork and Dismantling of Masonry Works.</b>					
		<b>Unit = metre</b>					
		<b>Taking output = 1 metre</b>					
		<b>A Up to 600 mm dia</b>					
		<b>a) Labour</b>					
		Mate	day	0.020	365.00	7.30	L-12
		Mazdoor	day	0.520	350.00	182.00	L-13
		<b>b) Overhead charges @ 08% on (a)</b>				15.14	
		<b>c) Contractor's profit @ 10% on (a+b)</b>				20.44	
		<b>Rate per metre = a+b+c</b>				224.89	
					say	<b>225.00</b>	
2.4 (ix)		<b>B Above 600 mm to 900 mm dia</b>					
		<b>a) Labour</b>					
		Mate	day	0.030	365.00	10.95	L-12
		Mazdoor	day	0.700	350.00	245.00	L-13
		<b>b) Overhead charges @ 08% on (a)</b>				20.48	
		<b>c) Contractor's profit @ 10% on (a+b)</b>				27.64	
		<b>Rate per metre = a+b+c</b>				304.07	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
					say	<u>304.00</u>	
2.4 (ix)	C	Above 900 mm					
		a) Labour					
		Mate	day	0.050	365.00	18.25	L-12
		Mazdoor	day	1.200	350.00	420.00	L-13
		b) Overhead charges @ 08% on (a)				35.06	
		c) Contractor's profit @ 10% on (a+b)				47.33	
		Rate per metre = a+b+c				520.64	
					say	<u>521.00</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					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
	I	By Manual Means					
	A	Bituminous courses					
		a) Labour					
		Mate	day	0.060	365.00	21.90	L-12
		Mazdoor for dismantling, loading and unloading	day	1.500	350.00	525.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.380	421.20	160.06	P&M-053
		c) Overhead charges @ 08% on (a+b)				56.56	
		d) Contractor's profit @ 10% on (a+b+c)				76.35	
		Rate per cum = a+b+c+d				839.86	
					say	<u>840.00</u>	
2.5 I	B	Granular courses					
		a) Labour					
		Mate	day	0.040	365.00	14.60	L-12
		Mazdoor for dismantling, loading and unloading.	day	1.000	350.00	350.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.330	421.20	139.00	P&M-053
		c) Overhead charges @ 08% on (a+b)				40.29	
		d) Contractor's profit @ 10% on (a+b+c)				54.39	
		Rate per cum = a+b+c+d				598.27	
					say	<u>598.00</u>	
2.5	II	By Mechanical Means					
	A	Bituminous course					
		a) Labour					
		Mate	day	0.010	365.00	3.65	L-12
		Mazdoor	day	0.300	350.00	105.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.380	421.20	160.06	P&M-053
		Farm tractor with ripper @ 60 cum per hour	hour	0.017	453.60	7.71	P&M-055
		c) Overhead charges @ 08% on (a+b)				22.11	
		d) Contractor's profit @ 10% on (a+b+c)				29.85	
		Rate per cum = a+b+c+d				328.38	
					say	<u>328.00</u>	
2.6	202	Dismantling of Cement Concrete Pavement					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.030	365.00	10.95	L-12
		Semi skilled mazdoor for operating pneumatic tools	day	0.500	420.00	210.00	L-14
		Mazdoors as helpers including loading and unloading	day	0.500	350.00	175.00	L-13
		<b>b) Machinery</b>					
		Air compressor 250 cfm with two leads for pneumatic cutters/ hammers @ 1 cum per hour	hour	1.000	370.80	370.80	P&M-001
		Tractor-trolley	hour	0.400	421.20	168.48	P&M-053
		Joint Cutting Machine with 2-3 blades	hour	1.000	313.83	313.83	P&M-083
		<b>c) Overhead charges @ 08% on (a+b)</b>				99.92	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				134.90	
		<b>Rate per cum = a+b+c+d</b>				1483.88	
					<b>say</b>	<b>1484.00</b>	
		<b>Note</b> 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	<b>Dismantling of Guard Rails</b>					
		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.					
		<b>Unit = running metre</b>					
		<b>Taking output = 1 metre</b>					
		<b>a) Labour</b>					
		Mate	day	0.006	365.00	2.19	L-12
		Mazdoor including loading and unloading	day	0.150	350.00	52.50	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.050	421.20	21.06	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				6.06	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				8.18	
		<b>Rate per metre = a+b+c+d</b>				89.99	
					<b>say</b>	<b>90.00</b>	
2.8	202	<b>Dismantling of Kerb Stone</b>					
		Dismantling kerb stone by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre					
		<b>Unit = running metre</b>					
		<b>Taking output = 10 metre</b>					
		<b>a) Labour</b>					
		Mate	day	0.010	365.00	3.65	L-12
		Mazdoor including loading and unloading	day	0.150	350.00	52.50	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.200	421.20	84.24	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				11.23	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				15.16	
		<b>Cost for 10 m = a+b+c+d</b>				166.78	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per metre = (a+b+c+d)/10				16.68	
					say	<u>17.00</u>	
2.9	202	<b>Dismantling of Kerb Stone Channel</b>					
		Dismantling kerb stone channel by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre					
		<b>Unit = running metre</b>					
		<b>Taking output = 10 metre</b>					
		<b>a) Labour</b>					
		Mate	day	0.015	365.00	5.48	L-12
		Mazdoor including loading and unloading	day	0.225	350.00	78.75	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.300	421.20	126.36	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				16.85	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				22.74	
		Cost for 10 m = a+b+c+d				250.17	
		Rate per metre = (a+b+c+d)/10				25.02	
					say	<u>25.00</u>	
2.10	202	<b>Dismantling of Kilometre Stone</b>					
		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.					
		<b>Unit = Each</b>					
		<b>Taking output = one KM stone</b>					
	<b>A</b>	<b>5th KM stone</b>					
		Quantity of cement concrete = 0.392 cum					
		<b>a) Labour</b>					
		Mate	day	0.130	365.00	47.45	L-12
		Mazdoor	day	0.750	350.00	262.50	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.150	421.20	63.18	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				29.85	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				40.30	
		Rate for one 5th KM stone = a+b+c+d				443.28	
					say	<u>443.00</u>	
	<b>B</b>	<b>Ordinary KM Stone</b>					
		Quantity of cement concrete = 0.269 cum					
		<b>a) Labour</b>					
		Mate	day	0.020	365.00	7.30	L-12
		Mazdoor	day	0.500	350.00	175.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.100	421.20	42.12	P&M-053
		<b>c) Overhead charges @ 08% on (a+b)</b>				17.95	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				24.24	
		Rate for one ordinary KM stone = a+b+c+d				266.61	
					say	<u>267.00</u>	
	<b>C</b>	<b>Hectometre Stone</b>					
		Quantity of cement concrete = 0.048 cum					
		<b>a) Labour</b>					
		Mate	day	0.004	365.00	1.46	L-12
		Mazdoor	day	0.100	350.00	35.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.020	421.20	8.42	P&M-053

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Overhead charges @ 08% on (a+b)				3.59	
		d) Contractor's profit @ 10% on (a+b+c)				4.85	
		Rate for one Hectometre stone = a+b+c+d				53.32	
					<i>say</i>	<u>53.00</u>	

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	<b>Excavation in Soil by Manual Means .</b>					
		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. Including <b>Royalty @ Rs15. per cum</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 120 cum</b>					
		<b>a) Labour</b>					
		Mate	day	1.800	365.00	657.00	L-12
		Mazdoor	day	45.000	350.00	15750.00	L-13
		<b>b) Machinery</b>					
		Truck 5.5 cum capacity	hour	10.000	832.59	8325.90	P&M-057
		<b>c) Overhead charges @ 08% on (a+b)</b>				1978.63	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				2671.15	
		Cost of 120 cum = a+b+c+d				29382.69	
		<b>Rate per cum = (a+b+c+d)/120</b>				244.86	
		<b>Royalty @ Rs.15 per cum</b>				15.00	
		<b>Rate per cum</b>			<b>say</b>	<b>260.00</b>	
		<b>Note</b> 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	<b>Excavation in Ordinary Rock by Manual Means</b>					
		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 Including <b>Royalty @ Rs15. per cum</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 120 cum</b>					
		<b>a) Labour</b>					
		Mate	day	2.800	365.00	1022.00	L-12
		Mazdoor	day	70.000	350.00	24500.00	L-13
		<b>b) Machinery</b>					
		Truck 5.5 cum capacity	hour	10.000	832.59	8325.90	P&M-057
		<b>c) Overhead charges @ 08% on (a+b)</b>				2707.83	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				3655.57	
		Cost for 120 cum = a+b+c+d				40211.31	
		<b>Rate per cum = (a+b+c+d)/120</b>				335.09	
		<b>Royalty @ Rs.15 per cum</b>				15.00	
		<b>Rate per cum</b>			<b>say</b>	<b>350.00</b>	
		<b>Note</b> 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	<b>Excavation in Soil with Dozer with lead upto 100 metres</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 180 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	365.00	29.20	L-12
		Mazdoor	day	2.000	350.00	700.00	L-13
		<b>b) Machinery</b>					
		Dozer, 80 HP @ 30 cum per hour	hour	6.000	4320.00	25920.00	P&M-014
		<b>c) Overhead charges @ 08% on (a+b)</b>				2131.94	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				2878.11	
		Cost for 180 cum = a+b+c+d				31659.25	
		<b>Rate per cum = (a+b+c+d)/180</b>				175.88	
		<b>Royalty @ Rs.15 per cum</b>				15.00	
		<b>Rate per cum</b>			<b>say</b>	<b>191.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.4	301	<b>Excavation in Ordinary Rock with Dozer with lead upto 100 metres</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 108 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	365.00	43.80	L-12
		Mazdoor	day	3.000	350.00	1050.00	L-13
		<b>b) Machinery</b>					
		Dozer, 80 HP @ 20 cum per hour	hour	6.000	4320.00	25920.00	P&M-014
		<b>c) Overhead charges @ 08% on (a+b)</b>				2161.10	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				2917.49	
		Cost for 108 cum = a+b+c+d				32092.39	
		<b>Rate per cum = (a+b+c+d)/108</b>				297.15	
					say	<b>297.00</b>	
		<b>Note</b>					
		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	<b>Excavation in Soil using Hydraulic Excavator CK 90 and Tippers with Disposal upto 1000 metres.</b>					
		Excavation for roadwork in soil with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in 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					
		<b>Unit = cum</b>					
		<b>Taking output = 360 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	365.00	29.20	L-12
		Mazdoor	day	2.000	350.00	700.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator 0.9 cum bucket capacity @ 60 cum per hour	hour	6.000	1512.00	9072.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	16.000	360.00	5760.00	P&M-048
		<b>c) Overhead charges @ 08% on (a+b)</b>				1244.90	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				1680.61	
		Cost for 360 cum = a+b+c+d				18486.71	
		<b>Rate per cum = (a+b+c+d)/360</b>				51.35	
					say	<b>51.00</b>	
3.7	301	<b>Excavation in Ordinary Rock using Hydraulic Excavator CK-90 and Tippers with Disposal upto 1000 metres.</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 240 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	365.00	29.20	L-12
		Mazdoor	day	2.000	350.00	700.00	L-13
		<b>b) Machinery</b>					
		Hydraulic Excavator 0.90 cum bucket capacity @ 36 cum per hour	hour	6.000	1512.00	9072.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	11.000	360.00	3960.00	P&M-048
		<b>c) Overhead charges @ 08% on (a+b)</b>				1100.90	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				1486.21	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 240 cum = a+b+c+d				16348.31	
		Rate per cum = (a+b+c+d)/240				68.12	
					say	<u>68.00</u>	
3.10	301	<b>Excavation in Marshy Soil</b>					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 300 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.080	365.00	29.20	L-12
		Mazdoor	day	2.000	350.00	700.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator 0.90 cum bucket capacity @ 50 cum per hour	hour	6.000	1512.00	9072.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	13.640	360.00	4910.40	P&M-048
		<b>c) Overhead charges @ 08% on (a+b)</b>				1176.93	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				1588.85	
		Cost for 300 cum = a+b+c+d				17477.38	
		Rate per cum = (a+b+c+d)/300				58.26	
					say	<u>58.00</u>	
3.11	301	<b>Removal of Unserviceable Soil with Disposal upto 1000 metres</b>					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 360 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.080	365.00	29.20	L-12
		Mazdoor	day	2.000	350.00	700.00	L-13
		<b>b) Machinery</b>					
		Excavator 0.90 cum bucket capacity @ 60 cum per hour	hour	6.000	1512.00	9072.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	16.360	360.00	5889.60	P&M-048
		<b>c) Overhead charges @ 08% on (a+b)</b>				1255.26	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				1694.61	
		Cost for 360 cum = a+b+c+d				18640.67	
		Rate per cum = (a+b+c+d)/360				51.78	
					say	<u>52.00</u>	
		<b>Note</b> 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.					
3.13	304	<b>Excavation for Structures</b>					
		Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.					
		(i) <b>Ordinary soil</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
		<b>A Manual Means (Depth upto 3 m)</b>					
		<b>a) Labour</b>					
		Mate	day	0.320	365.00	116.80	L-12
		Mazdoor	day	8.000	350.00	2800.00	L-13
		<b>b) Overhead charges @ 08% on (a)</b>				233.34	
		<b>c) Contractor's profit @ 10% on (a+b)</b>				315.01	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 10 cum = a+b+c				3465.16	
		Rate per cum = (a+b+c)/10				346.52	
					say	<u>347.00</u>	
		<b>Note</b> 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>B Mechanical Means (Depth upto 3 m)</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 300 cum</i>					
		a) Labour					
		Mate	day	0.320	365.00	116.80	L-12
		Mazdoor	day	8.000	350.00	2800.00	L-13
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.000	1512.00	9072.00	P&M-026
		c) Overhead charges @ 08% on (a+b)				959.10	
		d) Contractor's profit @ 10% on (a+b+c)				1294.79	
		Cost for 300 cum = a+b+c+d				14242.69	
		Rate per cum = (a+b+c+d)/300				47.48	
					say	<u>47.00</u>	
		<b>Note</b> 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) <b>Ordinary Rock (not requiring blasting)</b>					
		<b>A Manual Means (Depth upto 3 m)</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
		a) Labour					
		Mate	day	0.400	365.00	146.00	L-12
		Mazdoor	day	10.000	350.00	3500.00	L-13
		b) Overhead charges @ 08% on (a)				291.68	
		c) Contractor's profit @ 10% on (a+b)				393.77	
		Cost for 10 cum = a+b+c				4331.45	
		Rate per cum = (a+b+c)/10				433.14	
					say	<u>433.00</u>	
		<b>Note</b> 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>B Mechanical Means</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 216 cum</i>					
		a) Labour					
		Mate	day	0.240	365.00	87.60	L-12
		Mazdoor	day	6.000	350.00	2100.00	L-13
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.000	1512.00	9072.00	P&M-026
		c) Overhead charges @ 08% on (a+b)				900.77	
		d) Contractor's profit @ 10% on (a+b+c)				1216.04	
		Cost for 216 cum = a+b+c+d				13376.40	
		Rate per cum = (a+b+c+d)/216				61.93	
					say	<u>62.00</u>	
		<b>Note</b> 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) <b>Marshy soil</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>A Manual means ( upto 3 m depth)</b>					
		<b>a) Labour</b>					
		Mate/Supervisor	day	0.400	365.00	146.00	L-12
		Mazdoor	day	10.000	350.00	3500.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	2.670	421.20	1124.60	P&M-053
		<b>c) Material</b>					
		Selected earth for refilling	cum	5.000	23.65	118.25	M-163
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				391.11	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				528.00	
		Cost for 10 cum = a+b+c+d+e				5807.96	
		<b>Rate per cum = ( a+b+c+d+e)/ 10</b>				580.80	
					<b>say</b>	<b>581.00</b>	
		<b>Note</b>					
		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					
3.13 (v)		<b>B Mechanical Means</b>					
		<b>a) Labour</b>					
		i) Mate	day	0.080	365.00	29.20	L-12
		ii) Mazdoor for dressing sides, bottom and backfilling	day	2.000	350.00	700.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.170	1512.00	257.04	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.450	360.00	162.00	P&M-048
		<b>c) Material</b>					
		Selected earth for refilling	cum	5.000	23.65	118.25	M-163
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				101.32	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				136.78	
		Cost for 10 cum = a+b+c+d+e				1504.59	
		<b>Rate per cum = (a+b+c+d+e)/10</b>				150.46	
					<b>say</b>	<b>150.00</b>	
		<b>Note</b>					
		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	<b>Scarifying Existing Granular Surface to a Depth of 50 mm by Manual Means</b>					
		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.					
		<b>Unit = sqm</b>					
		<b>Taking output = 100 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.200	365.00	73.00	L-12
		Mazdoor including loading and unloading	day	5.000	350.00	1750.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	1.670	421.20	703.40	P&M-053
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				202.11	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				272.85	
		Cost for 100 sqm = a+b+c+d				3001.37	
		<b>Rate per sqm = (a+b+c+d)/100</b>				30.01	
					<b>say</b>	<b>30.00</b>	
		<b>Note</b>					
		In case material is to be reused at site, transportation cost catered above for disposal shall be deleted.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.15	305.4.3	<b>Scarifying Existing Bituminous Surface to a depth of 50 mm by Mechanical Means</b>					
		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.					
		<b>Unit = sqm</b>					
		<b>Taking output = 100 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.010	365.00	3.65	L-12
		Mazdoor	day	0.250	350.00	87.50	L-13
		<b>b) Machinery</b>					
		Tractor with ripper attachment @ 60 cum per hour	hour	0.080	453.60	36.29	P&M-055
		Front end loader 1 cum bucket capacity @ 25 cum per hour	hour	0.200	936.00	187.20	P&M-017
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.230	360.00	82.80	P&M-048
		<b>c) Overhead charges @ 08% on (a+b)</b>				31.80	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				42.92	
		Cost for 100 sqm = a+b+c+d				472.16	
		<b>Rate per sqm = (a+b+c+d)/100</b>				4.72	
					<b>say</b>	<b>5.00</b>	
3.16	305	<b>Construction of Embankment with Material obtained from Borrowpits</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 100 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	365.00	14.60	L-12
		Mazdoor	day	1.000	350.00	350.00	L-13
		<b>b) Machinery</b>					
		Hydraulic Excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1512.00	2525.04	P&M-026
		Tipper 10 tonne capacity	tonne.km	160 x L	2.88	691.20	Lead =1.5 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				69.12	
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	4320.00	2160.00	P&M-014
		Motor grader for grading @ 100 cum per hour	hour	1.000	2781.00	2781.00	P&M-032
		Water tanker 6 KL capacity	hour	4.000	150.00	600.00	P&M-060
		Vibratory roller 8 -10 tonnes @ 100 cum per hour	hour	1.000	832.59	832.59	P&M-059
		<b>c) Material</b>					
		Cost of water	KL	24.000	240.00	5760.00	M-189
		Compensation for earth taken from private land	cum	100.000	336.67	33666.67	M-092
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				3956.02	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				5340.62	
		Cost for 100 cum = a+b+c+d+e				58746.86	
		<b>Rate per cum = (a+b+c+d+e)/100</b>				587.47	
					<b>say</b>	<b>587.00</b>	
		<b>Note</b> 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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.17	305	<b>Construction of Embankment with Material Deposited from Roadway Cutting</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 100 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.020	365.00	7.30	L-12
		Mazdoor	day	0.500	350.00	175.00	L-13
		<b>b) Machinery</b>					
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	4320.00	2160.00	P&M-014
		Motor grader for grading @ 100 cum per hour	hour	1.000	2781.00	2781.00	P&M-032
		Water tanker 6 KL capacity	hour	4.000	150.00	600.00	P&M-060
		Vibratory roller 8-10 tonnes @ 100 cum per hour	hour	1.000	832.59	832.59	P&M-059
		<b>c) Material</b>					
		Cost of water	KL	24.000	240.00	5760.00	M-189
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				985.27	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				1330.12	
		Rate for 100 cum = a+b+c+d+e				14631.28	
		<b>Rate per cum = (a+b+c+d+e)/100</b>				146.31	
					<b>say</b>	<b>146.00</b>	
		<b>Note</b> 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	<b>Construction of Subgrade and Earthen Shoulders</b>					
		Construction of sub-grade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2					
		<b>Unit = cum</b>					
		<b>Taking output = 100 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	365.00	14.60	L-12
		Mazdoor	day	1.000	350.00	350.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1512.00	2525.04	P&M-026
		Tipper 10 tonne capacity	tonne.km	175xL	2.88	756.00	Lead = 1.5 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				75.60	
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	4320.00	2160.00	P&M-014
		Motor grader for grading @ 50 cum per hour	hour	2.000	2781.00	5562.00	P&M-032
		Water tanker with 6 km lead	hour	4.000	150.00	600.00	P&M-060
		Vibratory roller 8-10 tonnes @ 80 cum per hour	hour	1.250	832.59	1040.74	P&M-059
		<b>c) Material</b>					
		Cost of water	KL	24.000	240.00	5760.00	M-189
		Compensation for earth taken from private land	cum	100.000	336.67	33666.67	M-092
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				4200.85	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				5671.15	
		Cost for 100 cum = a+b+c+d+e				62382.65	
		<b>Rate per cum = (a+b+c+d+e)/100</b>				623.83	
					<b>say</b>	<b>624.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.24	309	<b>Surface Drains in Soil</b>					
		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>					
		<b>A Mechanical means</b>					
		<b>a) Labour</b>					
		Mate	day	0.010	365.00	3.65	L-12
		Mazdoor for dressing of bed and side of drain	day	0.250	350.00	87.50	L-13
		<b>b) Machinery</b>					
		Hydraulic Excavator 0.3 cum bucket capacity @ 30 metres per hour	hour	0.330	1512.00	498.96	P&M-026
		<b>c) Overhead charges @ 08% on (a+b)</b>				47.21	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				63.73	
		Cost for 10 metres = a+b+c+d				701.05	
		<b>Rate per metre = (a+b+c+d) / 10</b>				70.11	
					<i>say</i>	<b>70.00</b>	
3.24		<b>B Manual Means</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	365.00	29.20	L-12
		Mazdoor	day	2.000	350.00	700.00	L-13
		<b>b) Overhead charges @ 08% on (a)</b>				58.34	
		<b>c) Contractor's profit @ 10% on (a+b)</b>				78.75	
		Cost for 10 metres = a+b+c				866.29	
		<b>Rate per metre = (a+b+c)/10</b>				86.63	
					<i>say</i>	<b>87.00</b>	
		<b>Note</b>					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.
3.31	313	<b>Construction of Rock fill Embankment</b>					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 100 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.040	365.00	14.60	L-12
		Mazdoor	day	1.500	350.00	525.00	L-13
		<b>b) Machinery</b>					
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	4320.00	2160.00	P&M-014
		Vibratory road roller 8-10 tonnes @ 100 cum per hour	hour	1.000	832.59	832.59	P&M-059
		Water tanker 6 KL, one trip per hour	hour	2.000	150.00	300.00	P&M-060
		<b>c) Material</b>					
		Cost of water	KL	12.000	240.00	2880.00	M-189
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				536.98	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				724.92	
		Cost for 100 cum = a+b+c+d+e				7974.08	
		<b>Rate per cum = (a+b+c+d+e)/100</b>				79.74	
					<i>say</i>	<b>80.00</b>	
		<b>Note</b>					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.

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					
		<b>Unit = cum</b>					
		<b>Taking output = 225 cum (450 tonne)</b>					
		<b>a) Labour</b>					
		Mate	day	0.400	365.00	146.00	L-12
		Mazdoor skilled	day	2.000	490.00	980.00	L-15
		Mazdoor	day	8.000	350.00	2800.00	L-13
		<b>b) Machinery</b>					
		Wet mix plant @ 75 tonne capacity per hour	hour	6.000	2433.00	14598.00	P&M-094
		Electric generator 125 KVA	hour	6.000	2183.00	13098.00	P&M-018
		Water tanker 6 KL capacity 5 km lead with one trip per hour	hour	4.500	150.00	675.00	P&M-060
		Front end loader 1 cum bucket capacity	hour	6.000	936.00	5616.00	P&M-017
		Tipper 10 tonne	tonne.km	450 x L	2.88	3888.00	Lead =30 km & P&M-058
		Add 10 per cent of cost of carriage to cover loading and unloading				3888.00	
		Motor Grader 110 HP	hour	6.000	2781.00	16686.00	P&M-032
		Vibratory roller 8-10 t	hour	6.000	832.59	4995.54	P&M-059
		<b>c) Material</b>					
		Close graded Granular sub-base Material as per table 400-1					
		<b>For Grading-I Material</b>					
		53 mm to 9.5 mm @ 50 per cent	cum	144.000	1379.31	198620.24	M-013
		9.5 mm to 2.36 mm @ 20 per cent	cum	57.000	1632.64	93060.51	M-017
		2.36 mm below @ 30 per cent	cum	86.400	1762.64	152292.14	M-020
		Cost of water	KL	27.000	240.00	6480.00	M-189
		OR					
		<b>For Grading-II Material</b>					
		26.5 mm to 9.5 mm @ 35 per cent	cum	100.800	1412.64	142394.16	M-015
		9.5 mm to 2.36 mm @ 25 per cent	cum	72.000	1632.64	117550.12	M-017
		2.36 mm below @ 40 per cent	cum	115.200	1762.64	203056.19	M-020
		Cost of water	KL	27.000	240.00	6480.00	M-189
		OR					
		<b>For Grading-III Material</b>					
		9.5 mm to 4.75 mm @ 35 per cent	cum	100.800	1587.64	160034.16	M-016
		4.75 mm to 2.36 mm @ 12.5 per cent	cum	36.000	1762.64	63455.06	M-018
		2.36 mm below @ 52.5 per cent	cum	151.200	1762.64	266511.25	M-020
		Cost of water	KL	27.000	240.00	6480.00	M-189
4.1A	(i)	Rate per cum for grading-I Material					
	d)	Overhead charges @ 08% on (a+b+c)				44225.23	
	e)	Contractor's profit @ 10% on (a+b+c+d)				59704.07	
		Cost for 225 cum = a+b+c+d+e				656744.73	
		Rate per cum = (a+b+c+d+e)/225				2918.87	
						say	2919.00
4.1A	(ii)	Rate per cum for grading-II Material					
	d)	Overhead charges @ 08% on (a+b+c)				45747.44	
	e)	Contractor's profit @ 10% on (a+b+c+d)				61759.05	
		Cost for 225 cum = a+b+c+d+e				679349.50	
		Rate per cum = (a+b+c+d+e)/225				3019.33	
						say	3019.00
4.1A	(iii)	Rate per cum for grading-III Material					
	d)	Overhead charges @ 08% on (a+b+c)				47907.44	
	e)	Contractor's profit @ 10% on (a+b+c+d)				64675.05	
		Cost for 225 cum = a+b+c+d+e				711425.50	
		Rate per cum = (a+b+c+d+e)/225				3161.89	
						say	3162.00

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.2	401	<b>Granular Sub-Base with Coarse Graded Material (Table:- 400- 2)</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 300 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.400	365.00	146.00	L-12
		Mazdoor skilled	day	2.000	490.00	980.00	L-15
		Mazdoor	day	8.000	350.00	2800.00	L-13
		<b>b) Machinery</b>					
		Mortar Grader 110 HP @ 50 cum per hour	hour	6.000	2781.00	16686.00	P&M-032
		Vibratory roller 8 -10 tonne	hour	6.000	832.59	4995.54	P&M-059
		Water tanker 6 KL capacity	hour	3.000	150.00	450.00	P&M-060
		<b>c) Material</b>					
		For coarse graded Granular sub-base Materials per table 400-2					
		<b>For grading-I Material</b>					
		53 mm to 26.5 mm @ 35 per cent	cum	134.400	1345.97	180898.89	M-029
		26.5 mm to 4.75 mm @ 45 per cent	cum	172.800	1512.64	261384.28	M-026
		2.36 mm below @ 20 per cent (Coarse Sand)	cum	76.800	1762.64	135370.79	M-022
		Cost of water	KL	18.000	240.00	4320.00	M-189
		<b>OR</b>					
		<b>For Grading-II Material</b>					
		26.5 mm to 4.75 mm @ 75 per cent	cum	288.000	1512.64	435640.47	M-026
		2.36 mm below @ 25 per cent	cum	96.000	1762.64	169213.49	M-022
		Cost of water	KL	18.000	240.00	4320.00	M-189
		<b>OR</b>					
		<b>For Grading-III Material</b>					
		9.5 mm to 4.75 mm @ 66 per cent	cum	255.000	1587.64	404848.33	M-025
		2.36 mm below @ 34 per cent	cum	129.000	1762.64	227380.63	M-022
		Cost of water	KL	18.000	240.00	4320.00	M-189
4.2		(i) <b>Rate per cum for grading-I Material</b>					
		d) <b>Overhead charges @ 08% on (a+b+c)</b>				48642.52	
		e) <b>Contractor's profit @ 10% on (a+b+c+d)</b>				65667.40	
		Cost for 300 cum = a+b+c+d+e				722341.42	
		<b>Rate per cum = (a+b+c+d+e)/300</b>				2407.80	
					<b>say</b>	<b>2408.00</b>	
4.2		(ii) <b>Rate per cum for grading-II Material</b>					
		d) <b>Overhead charges @ 08% on (a+b+c)</b>				50818.52	
		e) <b>Contractor's profit @ 10% on (a+b+c+d)</b>				68605.00	
		Cost for 300 cum = a+b+c+d+e				754655.02	
		<b>Rate per cum = (a+b+c+d+e)/300</b>				2515.52	
					<b>say</b>	<b>2516.00</b>	
4.2		(iii) <b>Rate per cum for grading-III Material</b>					
		d) <b>Overhead charges @ 08% on (a+b+c)</b>				53008.52	
		e) <b>Contractor's profit @ 10% on (a+b+c+d)</b>				71561.50	
		Cost for 300 cum = a+b+c+d+e				787176.52	
		<b>Rate per cum = (a+b+c+d+e)/300</b>				2623.92	
					<b>say</b>	<b>2624.00</b>	
		<b>Note</b> 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	<b>Lime Stabilisation for Improving Sub-grade</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 300 cum (525 tonne)</b>					
		<b>A By Mechanical Means</b>					
		<b>a) Labour</b>					
		Mate	day	0.360	365.00	131.40	L-12
		Skilled mazdoor for alignment and geometrics	day	1.000	490.00	490.00	L-15
		Mazdoor for spraying lime	day	8.000	350.00	2800.00	L-13
		<b>b) Machinery</b>					
		Tractor with ripper and rotavator attachments @ 60 cum per hour for ripping and 25 cum per hour for mixing	hour	12.000	453.60	5443.20	P&M-055
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2781.00	16686.00	P&M-032
		Vibratory roller 8 - 10 tonne capacity	hour	6.00x0.65*	832.59	3247.10	P&M-059
		Water tanker 6 KL capacity	hour	12.000	150.00	1800.00	P&M-060
		<b>c) Material</b>					
		Lime at site	tonne	15.750	7834.00	123385.50	M-188
		Cost of water	KL	72.000	240.00	17280.00	M-189
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				13701.06	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				18496.43	
		Cost for 300 cum= a+b+c+d+e				203460.68	
		<b>Rate per cum = (a+b+c+d+e)/300</b>				678.20	
					<b>say</b>	<b>678.00</b>	
		<b>Note</b>					
		* 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>B By Manual Means</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 150 cum (263 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	1.440	365.00	525.60	L-12
		Mazdoor skilled	day	1.000	490.00	490.00	L-15
		Mazdoor	day	35.000	350.00	12250.00	L-13
		<b>b) Machinery</b>					
		Vibratory roller 8 - 10 tonne @ 60 cum per hour	hour	2.500	832.59	2081.48	P&M-059
		Water tanker 6 KL capacity	hour	6.000	150.00	900.00	P&M-060
		<b>c) Material</b>					
		Lime at site	tonne	8.000	7834.00	62672.00	M-188
		Cost of water	KL	36.000	240.00	8640.00	M-189
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				7004.73	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				9456.38	
		Cost for 150 cum= a+b+c+d+e				104020.18	
		<b>Rate per cum = (a+b+c+d+e)/150</b>				693.47	
					<b>say</b>	<b>693.00</b>	
4.4	402	<b>Lime Treated Soil for Sub- Base</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 300 cum (525 tonnes)</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>a) Labour</b>					
		Mate	day	0.480	365.00	175.20	L-12
		Mazdoor skilled	day	2.000	490.00	980.00	L-15
		Mazdoor	day	10.000	350.00	3500.00	L-13
		<b>b) Machinery</b>					
		Excavator 0.90 cum bucket capacity	hour	6.000	1512.00	9072.00	P&M-026
		Tipper for carriage of soil	tonne.km	525 x L	2.88	2268.00	Lead =1.5 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				226.80	
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2781.00	16686.00	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	832.59	4995.54	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	441.00	5292.00	P&M-054
		Water tanker 6 KL capacity	hour	12.000	150.00	1800.00	P&M-060
		<b>c) Material</b>					
		Lime at site	tonne	15.750	7834.00	123385.50	M-188
		Cost of water	KL	72.000	240.00	17280.00	M-189
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				14852.88	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				20051.39	
		Cost for 300 cum = a+b+c+d+e				220565.32	
		<b>Rate per cum= (a+b+c+d+e)/300</b>				735.22	
					<b>say</b>	<b>735.00</b>	
4.5	403	<b>Cement Treated Soil Sub Base/ Base</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 300 cum (525 tonnes)</b>					
		<b>For 4 per cent quantity of cement by weight of soil</b>					
		<b>a) Labour</b>					
		Mate	day	0.480	365.00	175.20	L-12
		Mazdoor skilled	day	2.000	490.00	980.00	L-15
		Mazdoor	day	10.000	350.00	3500.00	L-13
		<b>b) Machinery</b>					
		Excavator 0.90 cum bucket capacity	hour	6.000	1512.00	9072.00	P&M-026
		Tipper for carriage of soil	tonne.km	525 x L	2.88	2268.00	Lead =1.5 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				226.80	
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2781.00	16686.00	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	832.59	4995.54	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	441.00	5292.00	P&M-054
		Water tanker 6 KL capacity	hour	12.000	150.00	1800.00	P&M-060
		<b>c) Material</b>					
		Cement at site (@ 4 per cent of 525 tonne)	tonne	21.000	10800.63	226813.23	M-081
		Cost of water	KL	72.000	240.00	17280.00	M-189
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				23127.10	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				31221.59	
		Cost for 300 cum = a+b+c+d+e				343437.46	
		<b>Rate per cum= (a+b+c+d+e)/300</b>				1144.79	
					<b>say</b>	<b>1145.00</b>	
4.6	403	<b>Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Sub base/ Base</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 300 cum (600 tonnes)</b>					
		<b>Quantity of cement assumed as 4 per cent of quantity of crushed rock by weight.</b>					
		<b>a) Labour</b>					
		Mate	day	0.480	365.00	175.20	L-12
		Mazdoor skilled	day	2.000	490.00	980.00	L-15
		Mazdoor	day	10.000	350.00	3500.00	L-13
		<b>b) Machinery</b>					
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2781.00	16686.00	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	832.59	4995.54	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	441.00	5292.00	P&M-054
		Water tanker 6 KL capacity	hour	10.000	150.00	1500.00	P&M-060
		<b>c) Material</b>					
		Cement at site @ 4 per cent by weight of crushed aggregate (600 tonne)	tonne	24.000	10800.63	259215.12	M-081
		<b>Grading of material for sub-base course</b>					
		37.5 mm to 9.5 mm @ 55 per cent	cum	211.200	1392.64	294125.68	M-014
		9.5 mm to 4.75 mm @ 20 per cent	cum	76.800	1587.64	121930.79	M-025
		4.75 mm to 75 micron @ 25 per cent	cum	96.000	1762.64	169213.49	M-019
		Cost of water	KL	60.000	240.00	14400.00	M-189
		<b>or</b>					
		<b>Grading of material for Base course</b>					
		37.5 mm to 9.5 mm @ 32.5 per cent	cum	124.800	1392.64	173801.54	M-028
		9.5 mm to 4.75 mm @ 5 per cent	cum	19.200	1587.64	30482.70	M-025
		4.75 mm to 75 micron @ 62.5 per cent	cum	240.000	1762.64	423033.73	M-023
		Cost of water	KL	60.000	240.00	14400.00	M-189
4.6	(i)	<b>For Sub-Base course</b>					
		d) Overhead charges @ 08% on (a+b+c)				71361.11	
		e) Contractor's profit @ 10% on (a+b+c+d)				96337.49	
		Cost for 300 cum = a+b+c+d+e				1059712.42	
		Rate per cum = (a+b+c+d+e)/300				3532.37	
						<b>say 3532.00</b>	
4.6	(ii)	<b>For Base course</b>					
		d) Overhead charges @ 08% on (a+b+c)				74724.95	
		e) Contractor's profit @ 10% on (a+b+c+d)				100878.68	
		Cost for 300 cum = a+b+c+d+e				1109665.44	
		Rate per cum = (a+b+c+d+e)/300				3698.88	
						<b>say 3699.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.12	406	<b>Wet Mix Macadam</b>					
		Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.					
		<b>Unit = cum</b>					
		<b>Taking output = 225 cum (495 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.480	365.00	175.20	L-12
		Mazdoor skilled	day	2.000	490.00	980.00	L-15
		Mazdoor	day	10.000	350.00	3500.00	L-13
		<b>b) Machinery</b>					
		Wet mix plant of 75 tonne hourly capacity	hour	6.600	2433.00	16057.80	P&M-094
		Electric generator 125 KVA	hour	6.000	2183.00	13098.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	936.00	5616.00	P&M-017
		Paver finisher	hour	6.000	1132.20	6793.20	P&M-035
		Vibratory roller 8 - 10 tonne	hour	6x0.65	832.59	3247.10	P&M-059
		or					
		Smooth 3 wheeled steel roller @ 8-10 tonnes.	hour	12.000			
		Water tanker 6 KL capacity	hour	3.000	150.00	450.00	P&M-060
		Tipper	tonne.km	495 x L	2.88	42768.00	Lead =30 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				4276.80	
		<b>c) Material ( Table 400-11)</b>					
		45 mm to 22.4 mm@ 30 per cent	cum	89.100	3972.94	353988.86	M-034
		22.4 mm to 2.36 mm @ 40 per cent	cum	118.800	4143.77	492280.15	M-031
		2.36 mm to 75 micron@ 30 per cent	cum	89.100	1762.64	157051.27	M-022
		Cost of water	KL	18.000	240.00	4320.00	M-189
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				88368.19	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				119297.06	
		Cost for 225 cum = a+b+c+d+e				1312267.64	
		<b>Rate per cum = (a+b+c+d+e)/225</b>				5832.30	
					<b>say</b>	<b>5832.00</b>	
		<b>Note</b>					
		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	<b>Construction of Median and Island with Soil Taken from Roadway Cutting</b>					
		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					
		<b>Unit = cum</b>					
		<b>Taking output =21 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	365.00	87.60	L-12
		Mazdoor	day	6.000	350.00	2100.00	L-13
		<b>b) Machinery</b>					
		Water tanker 6 KL with 5 km lead and 1 trip per hour	hour	1.000	150.00	150.00	P&M-060
		Plate compactor @ 3.5 cum per hour	hour	6.000	417.78	2506.68	P&M-086
		<b>c) Material</b>					
		Cost of water	KL	6.000	240.00	1440.00	M-189
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				502.74	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Contractor's profit @ 10% on (a+b+c+d)				678.70	
		Cost for 21 cum = a+b+c+d+e				7465.72	
		Rate per cum = (a+b+c+d+e)/21				355.51	
					say	<u>356.00</u>	
		<b>Note</b> 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	<b>Construction of Median and Island with Soil Taken from Borrow Areas</b>					
		Construction of median and Island above road level with approved material brought from borrow pits, spread, sloped and compacted as per clause 407					
		<b>Unit = cum</b>					
		<b>Taking output = 21 cum</b>					
		a) <b>Labour</b>					
		Mate	day	0.160	365.00	58.40	L-12
		Mazdoor	day	4.000	350.00	1400.00	L-13
		b) <b>Machinery</b>					
		Water tanker with 5 km lead	hour	1.000	150.00	150.00	P&M-060
		Plate Compactor @ 3.5 cum per hour	hour	6.000	417.78	2506.68	P&M-086
		Hydraulic Excavator 1.0 cum bucket capacity @60 cum per hour	hour	0.500	1512.00	756.00	P&M-026
		Tipper 10 tonne capacity	tonne.km	52.5 x L	2.88	226.80	Lead =1.5 km & P&M-058
		Add 10 per cent of cost of transportation to cover cost of loading and unloading				22.68	
		c) <b>Material</b>					
		Cost of water	KL	6.000	240.00	1440.00	M-189
		d) <b>Overhead charges @ 08% on (a+b+c)</b>				524.84	
		e) <b>Contractor's profit @ 10% on (a+b+c+d)</b>				708.54	
		Cost for 21 cum = a+b+c+d+e				7793.95	
		Rate per cum = (a+b+c+d+e)/ 21				371.14	
					say	<u>371.00</u>	
		<b>Note</b> 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.					
4.16	409	<b>Footpaths and Separators</b>					
		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..					
		<b>Unit = sqm</b>					
		<b>Taking output = 300 sqm</b>					
		a) <b>Labour</b>					
		Mate	day	1.360	365.00	496.40	L-12
		Mason	day	4.000	490.00	1960.00	L-11
		Mazdoor	day	30.000	350.00	10500.00	L-13
		b) <b>Machinery</b>					
		Vibratory road roller 8 -10 tonnes @60 cum per hour	hour	0.750	832.59	624.44	P&M-059
		Water tanker 6 KL capacity @ 1 trip per hour	hour	2.000	150.00	300.00	P&M-060
		Concrete mixer 0.4/0.28 cum per hour	hour	6.000	270.00	1620.00	P&M-009
		c) <b>Material</b>					
		i) <b>For Granular sub base material</b>					
		53 mm to 26.5 mm @ 35 per cent	cum	20.790	1345.97	27982.80	M-029
		26.5 mm to 4.75 mm @ 45 per cent	cum	26.730	1512.64	40432.88	M-026

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		2.36 mm below @ 20 per cent	cum	11.880	1762.64	20940.17	M-022
		<b>ii) For cement concrete grade M157.5 cum</b>					
		Aggregate 12 mm crushed @ 0.9 cum of concrete	cum	6.750	4006.27	27042.34	M-052
		Sand @ 0.45 cum/cum of concrete	cum	3.380	4289.86	14499.72	M-004
		Cement	tonne	1.880	10800.63	20305.18	M-081
		<b>iii) For cement plaster 1:3</b>					
		Sand	cum	3.840	4289.86	16473.05	M-004
		Cement	tonne	1.830	10800.63	19765.15	M-081
		<b>iv) Pre-cast cement concrete tiles</b>					
		Tiles size 300 x 300 mm and 25 mm thick	each	3300.000	43.07	142131.00	M-184
		<b>v) RCC pipes</b>					
		Pipes 200 mm dia, 2.5 m long for drainage	metre	22.500	175.09	3939.53	M-137
		vi) Cost of water	KL	12.000	240.00	2880.00	M-189
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				28151.41	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				38004.41	
		Cost for 300 sqm = a+b+c+d+e				418048.48	
		<b>Rate per sqm = (a+b+c+d+e)/300</b>				1393.49	
					<b>say</b>	<b>1393.00</b>	

**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	<b>Prime Coat</b>					
		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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 3500 sqm</i>					
		<b>a) Labour</b>					
		Mate	day	0.080	365.00	29.20	L-12
		Mazdoor	day	2.000	350.00	700.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	2.800	414.00	1159.20	P&M-031
		Air compressor 250 cfm	hour	2.800	370.80	1038.24	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	2.000	1245.60	2491.20	P&M-004
		Water tanker 6 KL capacity @ 1 trip per hour	hour	1.000	150.00	150.00	P&M-060
		<b>c) Material</b>					
		Bitumen emulsion @ 0.6 kg per sqm	tonne	2.100	25295.49	53120.53	M-077
		Cost of water	KL	6.000	240.00	1440.00	M-189
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				4810.27	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				6493.86	
		Cost for 3500 sqm = a+b+c+d+e				71432.50	
		<b>Rate per sqm = (a+b+c+d+e)/3500</b>				20.41	
					<i>say</i>	<b>20.00</b>	
		<b>Note</b>					
		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	<b>Tack Coat</b>					
		Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.					
		<i>Unit = sqm</i>					
		<i>Taking output = 3500 sqm</i>					
		<b>a) Labour</b>					
		Mate	day	0.080	365.00	29.20	L-12
		Mazdoor	day	2.000	350.00	700.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	2.800	414.00	1159.20	P&M-031
		Air compressor 250 cfm	hour	2.800	370.80	1038.24	P&M-001
		Emulsion pressure distributor @ 1750 sqm per hour	hour	2.000	1245.60	2491.20	P&M-004
		<b>c) Material</b>					
		Bitumen emulsion @ 0.2 kg per sqm	tonne	0.700	25295.49	17706.84	M-077
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				1849.97	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				2497.47	
		Cost for 3500 sqm = a+b+c+d+e				27472.12	
		<b>Rate per sqm = (a+b+c+d+e)/3500</b>				7.85	
					<i>say</i>	<b>8.00</b>	
		<b>Note</b>					
		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.
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Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.6	507	<b>Dense Graded Bituminous Macadam</b>					
		Providing and laying dense graded bituminous macadam with 40-60 TPH batch type HMP producing an average output of 35 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5 per cent by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects					
		<b>Unit = cum</b>					
		<b>Taking output = 91 cum (210 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.392	365.00	143.08	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	7.500	350.00	2625.00	L-13
		Skilled mazdoor for checking line & levels	day	2.340	490.00	1146.60	L-15
		<b>b) Machinery</b>					
		Batch mix HMP 40-60 TPH @ 35 tonne per hour	hour	6.000	12870.00	77220.00	P&M-022
		Paver finisher hydrostatic with sensor control @ 40 cum per hour	hour	2.280	3105.00	7079.40	P&M-034
		Generator 100 KVA	hour	6.000	810.00	4860.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	936.00	5616.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	210 x L	2.88	18144.00	Lead =30 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				1814.40	
		smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	534.60	2084.94	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	832.59	3247.10	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1328.40	5180.76	P&M-045
		<b>c) Materials</b>					
		<b>Bitumen @ 4.25 per cent of weight of mix</b>	tonne	8.925	28965.49	258517.00	M-074
		<b>Aggregate</b>					
		Total weight of mix = 210 tonnes					
		Weight of bitumen = 8.925 tonnes					
		Weight of aggregate = 210 - 8.925 = 201.08 tonnes					
		<b>Taking density of aggregate = 1.5 ton/cum</b>					
		Volume of aggregate = 134.05 cum					
		<b>Grading - I40 mm (Nominal Size)</b>					
		37.5 - 25 mm 22 per cent	cum	29.491	3956.27	116674.43	M-049
		25 - 10 mm 13 per cent	cum	17.427	4006.27	69815.30	M-046
		10 - 4.75 mm 19 per cent	cum	25.470	4181.27	106494.92	M-040
		4.75 mm and below 44 per cent	cum	58.982	4206.27	248094.35	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	2.681	7834.00	21002.95	M-188
		<b>or</b>					
		<b>Grading - II19 mm (Nominal Size)</b>					
		25 - 10 mm 30 per cent	cum	40.215	4006.27	161112.24	M-046
		10 - 5 mm 28 per cent	cum	37.534	4181.27	156939.88	M-040
		5 mm and below 40 per cent	cum	53.620	4206.27	225540.32	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	2.681	7834.00	21002.95	M-188
		* 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 @ 08% on (a+b+c)				75980.82	
		e) Contractor's profit @ 10% on (a+b+c+d)				102574.11	
		Cost for 91 cum = a+b+c+d+e				1128315.16	
		Rate per cum = (a+b+c+d+e)/91 (For Grading I)				12399.07	
					say	<u>12399.00</u>	
		(ii) For GradingII(19 mm nominal size)					
		d) Overhead charges @ 08% on (a+b+c)				76181.89	
		e) Contractor's profit @ 10% on (a+b+c+d)				102845.56	
		Cost for 91 cum = a+b+c+d+e				1131301.12	
		Rate per cum = (a+b+c+d+e)/91 (For Grading-II)				12431.88	
					say	<u>12432.00</u>	
		<b>Note</b> *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 210 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 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.					
<b>5.8</b>	<b>509</b>	<b>Bituminous Concrete</b>					
		Providing and laying bituminous concrete with 40-60 TPH batch type hot mix plant producing an average output of 35 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 per cent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects					
		<b>Unit = cum</b>					
		<b>Taking output = 89 cum (210 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.392	365.00	143.08	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	7.500	350.00	2625.00	L-13
		Skilled mazdoor for checking line & levels	day	2.340	490.00	1146.60	L-15
		<b>b) Machinery</b>					
		Batch mix HMP 40-60 TPH @ 35 tonne per hour	hour	6.000	12870.00	77220.00	P&M-022

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Paver finisher hydrostatic with sensor control @ 40 cum per hour	hour	2.225	3105.00	6908.63	P&M-034
		Generator 100 KVA	hour	6.000	810.00	4860.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	936.00	5616.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	210 x L	2.88	18144.00	Lead =30 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				1814.40	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	534.60	2084.94	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	832.59	3247.10	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1328.40	5180.76	P&M-045
		<b>c) Material</b>					
		<b>i) Bitumen@ 5 per cent of weight of mix</b>	tonne	10.500	28965.49	304137.65	M-074
		<b>ii) Aggregate</b>					
		Total weight of mix = 210 tonnes					
		Weight of bitumen = 10.5 tonnes					
		Weight of aggregate = 210 -10.50 = 199.50 tonnes					
		<b>Taking density of aggregate = 1.5 ton/cum</b>					
		Volume of aggregate = 133 cum					
		<b>* Grading - I-19 mm (Nominal Size)</b>					
		20 - 10 mm 35 per cent	cum	46.550	4006.27	186491.98	M-045
		10 - 5 mm 23 per cent	cum	30.590	4181.27	127905.12	M-040
		5 mm and below 40 per cent	cum	53.200	4206.27	223773.69	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	2.660	7834.00	20838.44	M-188
		<b>or</b>					
		<b>Grading - II-13 mm (Nominal Size)</b>					
		13.2 - 10 mm 30 per cent	cum	39.900	4006.27	159850.27	M-044
		10 - 5 mm 25 per cent	cum	33.250	4181.27	139027.30	M-040
		5 mm and below 43 per cent	cum	57.190	4206.27	240556.71	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	2.660	7834.00	20838.44	M-188
		<b>*Any one of the alternative may be adopted as per approved design</b>					
		<b>(i) for Grading-I ( 13 mm nominal size )</b>					
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				79370.99	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				107150.84	
		Cost for 89 cum = a+b+c+d+e				1178659.20	
		<b>Rate per cum = (a+b+c+d+e)/89</b>				13243.36	
						<b>say</b>	<b>13243.00</b>
<b>5.8</b>		<b>(ii) for Grading-II(10 mm nominal size)</b>					
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				79472.07	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				107287.29	
		Cost for 89 cum = a+b+c+d+e				1180160.24	
		<b>Rate per cum = (a+b+c+d+e)/89 (For Grading-II)</b>				13260.23	
						<b>say</b>	<b>13260.00</b>
		<b>Note</b>					
		*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 210 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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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.					
<b>5.14</b>	<b>515</b>	<b>Mastic Asphalt</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Providing and laying 25 mm thick mastic asphalt wearing course with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated finegrained hard stone chipping of 13.2 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces is not less than 1000C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.					
		<b>Unit = sqm</b>					
		<b>Taking output = 35.00 sqm (0.87 cum ) assuming a density of 2.3 tonnes/cum.-2 tonnes</b>					
		<b>a) Labour</b>					
		Mate	day	0.440	365.00	160.60	L-12
		Mazdoor	day	10.000	350.00	3500.00	L-13
		Mazdoor skilled	day	1.000	490.00	490.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	0.060	414.00	24.84	P&M-031
		Air compressor 250 cfm	hour	0.060	370.80	22.25	P&M-001
		Mastic cooker 1 tonne capacity	hour	6.000	72.00	432.00	P&M-030
		Bitumen boiler 1500 litres capacity	hour	6.000	230.40	1382.40	P&M-005
		Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.000	421.20	421.20	P&M-053
		<b>c) Material</b>					
		Base mastic (without coarse aggregates) = 60 per cent					
		Coarse aggregate (6.3mm to 13.2 mm) = 40 per cent .					
		Proportion of material required for mastic asphalt with coarse aggregates (based on mix design done by CRRI 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	28965.49	5908.96	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	1762.64	687.43	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	7834.00	2820.24	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	4106.27	2258.45	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	640.25	11.52	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	29.00	14.50	M-074
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				1450.75	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				1958.51	
		Cost for 35.00 sqm = a+b+c+d+e				21543.66	
		<b>Rate per sqm = (a+b+c+d+e)/35</b>				615.53	
					<b>say</b>	<b>616.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.21	522	<b>Crack Prevention Courses</b>					
	(i)	<b>Stress absorbing membrane (SAM) crack width less than 6 mm</b>					
		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.					
		<b>Unit = sqm</b>					
		<b>Taking output = 10500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	365.00	87.60	L-12
		Mazdoor	day	6.000	350.00	2100.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	414.00	2484.00	P&M-031
		Air compressor 250 cfm	hour	6.000	370.80	2224.80	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1245.60	7473.60	P&M-004
		Hydraulic Chip spreader	hour	6.000	3060.00	18360.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	534.60	3207.60	P&M-044
		<b>c) Material</b>					
		Modified binder	tonne	9.450	34895.49	329762.38	M-078
		Crushed stone aggregates 5.6 mm size	cum	105.000	4206.27	441658.59	M-050
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				64588.69	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				87194.73	
		Cost for 10500 sqm = a+b+c+d+e				959141.99	
		<b>Rate per sqm = (a+b+c+d+e)/10500</b>				91.35	
					<b>say</b>	<b>91.00</b>	
5.21	(ii)	<b>Stress absorbing membrane (SAM) with crack width 6 mm to 9 mm</b>					
		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.					
		<b>Unit = sqm</b>					
		<b>Taking output = 10500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	365.00	87.60	L-12
		Mazdoor	day	6.000	350.00	2100.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	414.00	2484.00	P&M-031
		Air compressor 250 cfm capacity	hour	6.000	370.80	2224.80	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1245.60	7473.60	P&M-004
		Hydraulic Chip spreader	hour	6.000	3060.00	18360.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	534.60	3207.60	P&M-044
		<b>c) Material</b>					
		Modified binder	tonne	11.550	34895.49	403042.91	M-078
		Crushed stone chipping 11.2 mm size	cum	105.000	4006.27	420658.59	M-051
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				68771.13	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				92841.02	
		Cost for 10500 sqm = a+b+c+d+e				1021251.25	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per sqm = (a+b+c+d+e)/10500				97.26	
					say	<u>97.00</u>	
5.21	(iii)	<b>Stress absorbing membrane (SAM) crack width above 9 mm and cracked area above 50 per cent</b>					
		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					
		<b>Unit = sqm</b>					
		<b>Taking output = 10500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	365.00	87.60	L-12
		Mazdoor	day	6.000	350.00	2100.00	L-13
		Mazdoor skilled	day	2.000	490.00	980.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	414.00	2484.00	P&M-031
		Air compressor 250 cfm capacity	hour	6.000	370.80	2224.80	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1245.60	7473.60	P&M-004
		Hydraulic Chip spreader	hour	6.000	3060.00	18360.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	534.60	3207.60	P&M-044
		<b>c) Material</b>					
		Modified binder	tonne	15.750	34895.49	549603.97	M-078
		Crushed stone aggregates 11.2 mm size	cum	126.000	4006.27	504790.31	M-051
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				87304.95	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				117861.68	
		Cost for 10500 sqm = a+b+c+d+e				1296478.51	
		Rate per sqm = (a+b+c+d+e)/10500				123.47	
					say	<u>123.00</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	<b>Dry Lean Cement Concrete Sub- base</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 450 cum (990 tonne)</b>					
		<b>a) Labour</b>					
		Mate	day	1.120	365.00	408.80	L-12
		Mazdoor skilled	day	6.000	490.00	2940.00	L-15
		Mazdoor	day	22.000	350.00	7700.00	L-13
		<b>b) Machinery</b>					
		Front end loader 1 cum bucket capacity	hour	6.000	936.00	5616.00	P&M-017
		Cement concrete batch mix plant @ 75 cum per hour	hour	6.000	3005.64	18033.84	P&M-068
		Electric generator 100 KVA	hour	6.000	810.00	4860.00	P&M-080
		Paver with electronic sensor	hour	6.000	3105.00	18630.00	P&M-034
		Vibratory roller 8-10 t capacity	hour	8.000	832.59	6660.72	P&M-059
		Water tanker 6 KL capacity	hour	8.000	150.00	1200.00	P&M-060
		Tipper	tonne.km	990 x L	2.88	85536.00	Lead =30 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				8553.60	
		<b>c) Material</b>					
		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	4006.00	1622430.00	M-052 and M-054
		Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete	cum	203.000	4289.86	870841.01	M-004
		Cement @ 150 kg/cum of concrete	tonne	67.500	10800.63	729042.53	M-081
		Cost of water	KL	48.000	240.00	11520.00	M-189
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				271517.80	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				366549.03	
		Cost for 205 cum = a+b+c+d+e				4032039.32	
		<b>Rate per cum = (a+b+c+d+e)/450</b>				8960.09	
					<b>say</b>	<b>8960.00</b>	
		<b>Note</b>					
		Quantity provided for aggregate is for estimating purpose. Exact quantity shall be as per mix design.					
6.2	602	<b>Cement Concrete Pavement</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 1050 cum (2415 tonne)</b>					
		<b>a) Labour</b>					
		Mate	day	2.000	365.00	730.00	L-12
		Mazdoor skilled	day	15.000	490.00	7350.00	L-15
		Mazdoor	day	35.000	350.00	12250.00	L-13
		<b>b) Machinery</b>					
		Road Sweeper @ 1250 sqm per hour	hour	2.800	414.00	1159.20	P&M-031
		Front end loader 1 cum bucket capacity	hour	18.000	936.00	16848.00	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	7013.16	42078.96	P&M-067
		Electric generator 250 KVA	hour	6.000	700.00	4200.00	P&M-081
		Slip form paver with electronic sensor	hour	6.000	3330.00	19980.00	P&M-006
		Water tanker 6 KL capacity	hour	36.000	150.00	5400.00	P&M-060
		Transit truck agitator 5 cum capacity.	tonne.km	2415xL	2.88	208656.00	Lead =30 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				20865.60	
		Concrete joint cutting machine .	hour	12.000	313.83	3765.96	
		Texturing machine .	hour	12.000	105.44	1265.28	
		<b>c) Material</b>					
		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	4006.00	3785670.00	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	4289.86	2029102.45	M-004
		Cement 43 grade @ 400 kg/cum of concrete	tonne	414.000	10800.63	4471460.82	M-081
		32 mm mild steel dowel bars of grade S 240	tonne	9.450	56032.85	529510.43	M-126
		16 mm deformed steel tie bars of grade S 415	tonne	1.170	48832.85	57134.43	M-082
		Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	3675.000	15.80	58065.00	M-164
		Pre moulded Joint filler, 25 mm thick for expansion joint.	sqm	16.330	987.63	16128.00	M-141
		Joint sealant	kg	875.000	25.28	22120.00	M-120
		Sealant primer	kg	116.670	12.64	1474.71	M-097
		Plastic sheath, 1.25 mm thick for dowel bars	sqm	46.670	15.80	737.39	M-138
		Curing compound	liter	1850.000	126.41	233858.50	M-090
		Super plastisizer admixture IS marked as per 9103-1999 @ 0.5 per cent by weight of cement	kg	2070.000	158.02	327101.40	M-180
		Cost of water	KL	216.000	240.00	51840.00	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				115842.03	
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				963567.53	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				1300816.17	
		Cost for 1050cum = a+b+c+d+e				14308977.86	
		<b>Rate per cum = (a+b+c+d+e)/1050</b>				13627.60	
					<b>say</b>	<b><u>13628.00</u></b>	
		<b>Note</b>					The quantities for cement, coarse aggregate and fine aggregates are for estimating only .The exact quantities will be as per mix design.

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	<b>Cast in Situ Cement Concrete M20 Kerb</b>						
		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						
		<b>Unit = Running metre</b>						
		<b>Taking output = 360 metre</b>						
	A.	<b>Using Concrete Mixer</b>						
		<b>Cement Concrete</b>						
		Cement concrete of grade M20 = 12.60 cum						
		Cement concrete of grade M10 for base= 11.61 cum						
		Total Concrete = <b>24.21 cu.m</b>						
		<b>a) Labour</b>						
		Mate	day	0.720	365.00	262.80	L-12	
		Mason	day	2.000	490.00	980.00	L-11	
		Mazdoor	day	16.000	350.00	5600.00	L-13	
		<b>b) Machinery</b>						
		Kerb casting machine @ 60 metres/hour	hour	6.000	360.00	2160.00	P&M-029	
		Concrete mixer 0.48/0.28 cum capacity	hour	12.000	270.00	3240.00	P&M-009	
		Water tanker6 KL capacity	hour	5.000	150.00	750.00	P&M-060	
		<b>c) Material</b>						
		Crushed stone aggregate 20 mm nominal size 59 per cent	cum	21.790	4006.27	87296.67	M-053	
		Coarse sand 30 per cent	cum	10.900	4289.86	46759.44	M-004	
		Cement 11 per cent	tonne	5.700	10800.63	61563.59	M-081	
		Cost of water	KL	30.000	240.00	7200.00	M-189	
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				17265.00		
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				23307.75		
		Cost for 360 meter = a+b+c+d+e				256385.26		
		<b>Rate per metre = (a+b+c+d+e)/360</b>				712.18		
					<b>say</b>	<b>712.00</b>		
	B	<b>Using Concrete Batching and Mixing Plant</b>						
		<b>Cement Concrete</b>						
		Cement concrete of grade M20 = 12.60 cum						
		Cement concrete of grade M10 for base = 11.61 cum						
		Total Concrete = <b>24.21 cu.m</b>						
		<b>a) Labour</b>						
		Mate	day	0.120	365.00	43.80	L-12	
		Mason	day	1.000	490.00	490.00	L-11	
		Mazdoor	day	2.000	350.00	700.00	L-13	
		<b>b) Machinery</b>						
		Kerb casting machine @ 60 metres/hour	hour	6.000	360.00	2160.00	P&M-029	
		Concrete batching and mixing plant @ 15 cum/hr.	hour	1.600	2160.00	3456.00	P&M-003	
		Water tanker6 KL capacity	hour	5.000	150.00	750.00	P&M-060	
		Tipper 5.5 cum capacity	hour	6.000	360.00	2160.00	P&M-048	
		<b>c) Material</b>						
		Crushed stone aggregate 20 mm nominal size 59 per cent	cum	21.790	4006.27	87296.67	M-053	
		Coarse sand 30 per cent	cum	10.900	4289.86	46759.44	M-004	
		Cement 11 per cent	tonne	5.700	10800.63	61563.59	M-081	
		Cost of water	KL	30.000	240.00	7200.00	M-189	
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				17006.36		
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				22958.59		
		Cost for 360 meter = a+b+c+d+e				252544.46		
		<b>Rate per metre = (a+b+c+d+e)/360</b>				701.51		
					<b>say</b>	<b>702.00</b>		
8.2	408	<b>Cast in Situ Cement Concrete M 20 Kerb with Channel</b>						
		Construction of cement concrete kerb with channel with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M10 grade foundation 150 mm thick, kerb channel 300 mm wide, 50 mm thick in PCCM20 grade, sloped towards the kerb, kerb stone with channel laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408						

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	A	<b>Using Concrete Mixer</b>					
		<i>Unit = Running metre</i>					
		<i>Taking output = 300 metre length</i>					
		<b>Cement Concrete</b>					
		Cement concrete of grade M20= 17.48 cum					
		Cement concrete of grade M10 for base = 23.18 cum					
		Total Concrete = <b>40.66 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.720	365.00	262.80	L-12
		Mason	day	2.000	490.00	980.00	L-11
		Mazdoor	day	16.000	350.00	5600.00	L-13
		<b>b) Machinery</b>					
		Kerb casting machine @ 50 metres/hour for laying kerb and channel	hour	6.000	360.00	2160.00	P&M-029
		Concrete mixer 0.48/0.28	hour	16.000	270.00	4320.00	P&M-009
		Water tanker 6 KL capacity	hour	6.000	150.00	900.00	P&M-060
		<b>c) Material</b>					
		Crushed stone aggregate 20 mm nominal size 60 per cent	cum	36.590	4006.27	146589.50	M-053
		Coarse sand 30 per cent	cum	18.300	4289.86	78504.39	M-004
		Cement 10 per cent	tonne	9.010	10800.63	97313.68	M-081
		Cost of water	KL	36.000	240.00	8640.00	M-189
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				27621.63	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				37289.20	
		Cost for 360 meter = a+b+c+d+e				410181.20	
		<b>Rate per metre = (a+b+c+d+e)/300</b>				1367.27	
					<b>say</b>	<b>1367.00</b>	
8.2	B	<b>Using Concrete Batching and Mixing Plant</b>					
		<i>Unit = Running metre</i>					
		<i>Taking output = 300 metre length</i>					
		<b>Cement Concrete</b>					
		Cement concrete of grade M20= 17.48 cum					
		Cement concrete of grade M10 for base = 23.18 cum					
		Total Concrete = <b>40.66 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	365.00	43.80	L-12
		Mason	day	1.000	490.00	490.00	L-11
		Mazdoor	day	2.000	350.00	700.00	L-13
		<b>b) Machinery</b>					
		Kerb casting machine @ 50 metres/hour for laying kerb and channel	hour	6.000	360.00	2160.00	P&M-029
		Concrete batching and mixing plant @ 15 cum/hr.	hour	2.700	2160.00	5832.00	P&M-003
		Water tanker 6 KL capacity	hour	6.000	150.00	900.00	P&M-060
		Tipper of 5.5 cum capacity	hour	6.000	360.00	2160.00	P&M-048
		<b>c) Material</b>					
		Crushed stone aggregate 20 mm nominal size 60 per cent	cum	36.590	4006.27	146589.50	M-053
		Coarse sand 30 per cent	cum	18.300	4289.86	78504.39	M-004
		Cement 10 per cent	tonne	9.010	10800.63	97313.68	M-081
		Cost of water	KL	36.000	240.00	8640.00	M-189
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				27466.67	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				37080.00	
		Cost for 300 meter = a+b+c+d+e				407880.04	
		<b>Rate per metre = (a+b+c+d+e)/300</b>				1359.60	
					<b>say</b>	<b>1360.00</b>	
8.3	801	<b>Printing New Letter and Figures of any Shade</b>					
		Printing new letter and figures of any shade with synthetic enamel paint black or any other approved colour to give an even shade					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	(i)	<b>Hindi</b> ( Matras commas and the like not to be measured and paid for Half letter shall be counted as half )					
		<b>Details for 100 letters of 16 cm height i.e. 1600 cm</b>					
		<b>Unit = per cm height per letter</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	365.00	43.80	L-12
		Painter	day	2.000	490.00	980.00	L-18
		Mazdoor	day	1.000	350.00	350.00	L-13
		<b>b) Material</b>					
		Paint	Litre	0.700	233.78	163.65	M-131
		<b>c) Overhead charges @ 08% on (a+b)</b>				123.00	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				166.04	
		Cost for 1600 cm = a+b+c+d				1826.49	
		<b>Rate per cm height per letter = (a+b+c+ d)/1600</b>				1.14	
					<b>say</b>	<b>1.10</b>	
8.3	(ii)	<b>English and Roman</b>					
		Hyphens and the like not to be measured and paid for					
		Detail for 100 letters of 16 cm height. i.e.1600 cm					
		Unit = per cm height per letter					
		<b>a) Labour</b>					
		Mate	day	0.070	365.00	25.55	L-12
		Painter 1st class	day	1.250	490.00	612.50	L-18
		Mazdoor	day	0.500	350.00	175.00	L-13
		<b>b) Material</b>					
		Paint	Litre	0.500	233.78	116.89	M-131
		<b>c) Overhead charges @ 08% on (a+b)</b>				74.40	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				100.43	
		Cost for 1600 cm = a+b+c+d				1104.77	
		<b>Rate per cm height per letter = (a+b+c +d)/1600</b>				0.69	
					<b>say</b>	<b>0.70</b>	
8.4	801	<b>Retro-Reflectorised Traffic Signs</b>					
		Providing and fixing of retro- reflectorised cautionary, mandatory and informatory sign as per IRC :67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing					
		<b>Unit = Each</b>					
		<b>Taking output = one traffic sign</b>					
		<b>i) Excavation for foundation</b>	cum	0.216	347.00	74.95	Item No. 3.13
		<b>ii) Cement concrete M15 grade</b>	cum	0.120	13016.00	1561.92	Item 12.8 (A)
		<b>iii) Painting angle iron post two coats</b>	sqm	0.430	73.00	31.39	Item 8.9
		<b>a) Labour (For fixing at site)</b>					
		Mate	day	0.010	365.00	3.65	L-12
		Mazdoor	day	0.250	350.00	87.50	L-13
		<b>b) Material</b>					
		Mild steel angle iron 75 x 75 x 6 mm	kg	19.000	64.33	1222.32	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	8965.58	3137.95	M-061
		or					
	( ii )	60 cm equilateral triangle	sqm	0.156	8965.58	1398.63	M-061

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		or					
		( iii ) 60 cm circular	sqm	0.283	8965.58	2537.26	M-061
		or					
		( iv ) 80 mm x 60 mm rectangular	sqm	0.480	8965.58	4303.48	M-061
		or					
		( v ) 60 cm x 45 cm rectangular	sqm	0.270	8965.58	2420.71	M-061
		or					
		(vi) 60 cm x 60 cm square	sqm	0.360	8965.58	3227.61	M-061
		or					
		( vii ) 90 cm high octagon	sqm	0.672	8965.58	6024.87	M-061
		c) Machinery					
		Tractor-trolley	hour	0.010	421.20	4.21	P&M-053
		( i ) 90 cm equilateral triangle					
		d) Overhead charges @ 08% on (a+b+c)				356.45	
		e) Contractor's profit @ 10% on (a+b+c+d)				481.21	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				6961.56	
					say	<u>6962.00</u>	
		( ii ) 60 cm equilateral triangle					
		d) Overhead charges @ 08% on (a+b+c)				217.31	
		e) Contractor's profit @ 10% on (a+b+c+d)				293.36	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				4895.25	
					say	<u>4895.00</u>	
		( iii ) 60 cm circular					
		d) Overhead charges @ 08% on (a+b+c)				308.40	
		e) Contractor's profit @ 10% on (a+b+c+d)				416.33	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				6247.94	
					say	<u>6248.00</u>	
		( iv ) 80 mm x 60 mm rectangular					
		d) Overhead charges @ 08% on (a+b+c)				449.69	
		e) Contractor's profit @ 10% on (a+b+c+d)				607.09	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				8346.21	
					say	<u>8346.00</u>	
		( v ) 60 cm x 45 cm rectangular					
		d) Overhead charges @ 08% on (a+b+c)				299.07	
		e) Contractor's profit @ 10% on (a+b+c+d)				403.75	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				6109.47	
					say	<u>6109.00</u>	
		(vi) 60 cm x 60 cm square					
		d) Overhead charges @ 08% on (a+b+c)				363.62	
		e) Contractor's profit @ 10% on (a+b+c+d)				490.89	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				7068.07	
					say	<u>7068.00</u>	
		( vii ) 90 cm high octagon					
		d) Overhead charges @ 08% on (a+b+c)				587.40	
		e) Contractor's profit @ 10% on (a+b+c+d)				793.00	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				10391.22	
					say	<u>10391.00</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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Providing and erecting direction and place identification retro-reflectorised sign as per IRC:67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 2 mm thick with area not exceeding 0.9 sqm supported on a mild steel single angle iron post 75 x 75 x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 x 45 x 60 cm, 60 cm below ground level as per approved drawing					
		<b>Unit = sqm</b>					
		<b>Taking output = 0.9 sqm</b>					
		<b>i) Excavation for foundation</b>	cum	0.216	347.00	74.95	Item No. 3.13
		<b>ii) Cement concrete M15 grade</b>	cum	0.120	13016.00	1561.92	Item 12.8 (A)
		<b>iii) Painting angle iron post two coats</b>	sqm	0.430	73.00	31.39	Item 8.9
		<b>a) Labour (For fixing at site)</b>					
		Mate	day	0.010	365.00	3.65	L-12
		Mazdoor	day	0.200	350.00	70.00	L-13
		<b>b) Material</b>					
		Mild steel angle iron 75 mm x 75 mm x 6 mm, 2.85 metres long	kg	19.000	64.33	1222.32	M-179 /1000
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting of size 0.9 sqm	sqm	0.900	8965.58	8069.02	M-061
		Add 2 per cent of cost of materials for drilling holes, nuts, bolts, fabrication etc.					
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.020	421.20	8.42	P&M-053
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				749.87	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				1012.33	
		Cost for 0.9 sqm =i+ii+iii+ a+b+c+d+e				12803.89	
		<b>Rate per sqm (for sign having area upto 0.9 sqm) = (I+ii+iii+a+b+c+d+e)/0.90</b>				14226.54	
					<b>say</b>	<b>14227.00</b>	
	<b>Note</b>	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					
<b>8.6</b>	<b>801</b>	<b>Direction and Place Identification Signs with size more than 0.9 sqm size Board.</b>					
		Providing and erecting direction and place identification retro-reflectorised sign as per IRC :67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 2 mm thick with area exceeding 0.9 sqm supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm, 2 Nos. firmly fixed to the ground by means of properly designed foundation with M 15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing					
		<b>Unit = sqm</b>					
		<b>Taking output = 1.50 sqm</b>					
		<b>i) Excavation for foundation</b>	cum	0.430	347.00	149.21	Item No. 3.13
		<b>ii) Cement concrete M15 grade</b>	cum	0.240	13016.00	3123.84	Item 12.8 (A)
		<b>iii) Painting angle iron post 2 coats</b>	sqm	0.860	73.00	62.78	Item 8.9
		<b>a) Labour (For fixing at site)</b>					
		Mate	day	0.010	365.00	3.65	L-12
		Mazdoor	day	0.300	350.00	105.00	L-13
		<b>b) Material</b>					
		Mild steel angle iron 75 mm x 75 mm x 6 mm, 2.85 metres long, 2 nos	kg	38.000	64.33	2444.65	M-179 /1000
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting	sqm	1.500	8965.58	13448.37	M-061

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add 2 per cent of cost of materials for drilling holes, nuts, bolts, fabrication etc.					
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.020	421.20	8.42	P&M-053
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				1272.12	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				1728.22	
		Cost for 1.5 sqm =I+ii+ii+ a+b+c+d+e				22346.26	
		<b>Rate per sqm ( for sign having area more than 0.9 sqm) = ( i+ii+iii+a+b+c+d+e)/1.50</b>				24829.18	
					<b>say</b>	<b>24829.00</b>	
		<b>Note</b> 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	<b>Overhead Signs</b>					
		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					
		<b>A Truss and Vertical Support</b>					
		<b>Unit = tonne</b>					
		<b>Taking output = 1 tonne</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	365.00	87.60	L-12
		Blacksmith	day	2.000	490.00	980.00	L-02
		Mazdoor including for handling & fixing at site.	day	4.000	350.00	1400.00	L-13
		<b>b) Material</b>					
		Aluminium alloy/galvanised steel including 5 per cent wastage	tonne	1.050	38423.91	40345.11	M-060
		Add 1 per cent on cost of material for nuts, bolts and drilling and welding consumables				403.45	
		Add 15 per cent on cost of material for fabrication of trusses as per approved design				6112.28	
		<b>c) Machinery</b>					
		Crane 3 tonne capacity	hour	3.000	414.00	1242.00	P&M-013
		Truck	hour	0.500	832.59	416.30	P&M-057
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				4078.94	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				5506.57	
		<b>Rate per tonne = (a+b+c+d+e)</b>				60572.24	
					<b>say</b>	<b>60572.00</b>	
8.7	B	<b>Aluminium Alloy Plate for Over Head Sign</b>					
		<b>Unit = sqm</b>					
		<b>Taking output = 1 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.020	365.00	7.30	L-12
		Blacksmith	day	0.100	490.00	49.00	L-02
		Mazdoor	day	0.150	350.00	52.50	L-13
		<b>b) Material</b>					
		Aluminium alloy plate,2 mm thick, fixed with high intensity grade sheeting vide clause 801.3	sqm	1.000	9605.98	9605.98	M-059
		<b>Miscellaneous</b>					
		Add 1 per cent of cost of labour for lifting arrangement, like ladders, pulleys, ropes etc				1.09	
		<b>c) Overhead charges @ 08% on (a+b)</b>				777.27	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				1049.31	
		<b>Rate per sqm = (a+b+c+d)</b>				11542.45	
					<b>say</b>	<b>11542.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Note</b>					
		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.					
<b>8.8</b>	<b>803</b>	<b>Painting Two Coats on New Concrete Surfaces</b>					
		Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces					
		<b>Unit = sqm</b>					
		<b>Taking output = 40 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	365.00	43.80	L-12
		Painter	day	2.000	490.00	980.00	L-18
		Mazdoor	day	1.000	350.00	350.00	L-13
		<b>b) Material</b>					
		Paint conforming to requirement of clause 803.3.	Litre	6.000	233.78	1402.68	M-132
		Add for scaffolding @ 1 per cent of labour cost where required				14.03	
		Add @ 5 per cent cost of labour and materials to prepare the surface by filling minuts roughness on the surface and priming the surface before laying 2 coats of painting.				138.82	
		<b>c) Overhead charges @ 08% on (a+b)</b>				234.35	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				316.37	
		Cost for 40 sqm = a+b+c+d				3480.04	
		<b>Rate per sqm = (a+b+c+d)/40</b>				87.00	
					<b>say</b>	<b>87.00</b>	
<b>8.9</b>	<b>803</b>	<b>Painting on Steel Surfaces</b>					
		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					
		<b>Unit = sqm</b>					
		<b>Taking output = 10 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.030	365.00	10.95	L-12
		Painter	day	0.450	490.00	220.50	L-18
		Mazdoor	day	0.250	350.00	87.50	L-13
		<b>b) Material</b>					
		Paint ready mixed approved brand.	Litre	1.250	233.78	292.23	M-131
		Add @ 1 per cent on cost of material for scaffolding				2.92	
		Add @ 5 per cent cost of labour and materials to prepare the surface by filling minuts roughness on the surface and priming the surface before laying 2 coats of painting.				30.56	
		<b>c) Overhead charges @ 08% on (a+b)</b>				51.57	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				69.62	
		Cost for 10 sqm = a+b+c+d				765.85	
		<b>Rate per sqm= (a+b+c+d)/10</b>				76.59	
					<b>say</b>	<b>77.00</b>	
<b>8.11</b>	<b>803</b>	<b>Painting Lines, Dashes, Arrows etc on Roads in Two Coats on New Work</b>					
		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					
		<b>(i) Over 10 cm in width</b>					
		<b>Unit = sqm</b>					
		<b>Taking output = 10 sqm</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.090	365.00	32.85	L-12
		Painter	day	0.550	490.00	269.50	L-18
		Mazdoor	day	1.550	350.00	542.50	L-13
		b) Material					
		Road marking Paint as per IS :164	Litre	1.480	233.78	345.99	M-132
		c) Overhead charges @ 08% on (a+b)				95.27	
		d) Contractor's profit @ 10% on (a+b+c)				128.61	
		Cost for 10 sqm = a+b+c+d				1414.72	
		Rate per sqm = (a+b+c+d)/10				141.47	
					say	<u>141.00</u>	
8.11	(ii)	Up to 10 cm in width					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.070	365.00	25.55	L-12
		Painter	day	0.350	490.00	171.50	L-18
		Mazdoor	day	1.350	350.00	472.50	L-13
		b) Material					
		Road marking paint	Litre	1.480	233.78	345.99	M-132
		c) Overhead charges @ 08% on (a+b)				81.24	
		d) Contractor's profit @ 10% on (a+b+c)				109.68	
		Cost for 10 sqm = a+b+c+d				1206.47	
		Rate per sqm = (a+b+c+d)/10				120.65	
					say	<u>121.00</u>	
8.13	803	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.					
		Unit = sqm					
		Taking output = 640 sqm					
		a) Labour					
		Mate	day	0.500	365.00	182.50	L-12
		Mazdoor	day	2.000	350.00	700.00	L-13
		b) Machinery					
		Road marking machine @ 80 sqm per hour	hour	8.000	108.00	864.00	P&M-043
		Tractor-trolley	hour	8.000	421.20	3369.60	P&M-053
		c) Material					
		Hot applied thermoplastic compound	Litre	2000.000	205.58	411160.00	M-118
		Reflectorising glass beads	kg	200.000	66.81	13362.00	M-152
		d) Overhead charges @ 08% on (a+b+c)				34371.05	
		e) Contractor's profit @ 10% on (a+b+c+d)				46400.91	
		Cost for 640 sqm = a+b+c+d+e				510410.06	
		Rate per sqm = a+b+c+d+e)/640				850.68	
					say	<u>851.00</u>	
	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 M15grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and printing etc					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	(i)	5th kilometre stone (precast)					
		<i>Unit = Nos.</i>					
		<i>Taking output = 6 Nos.</i>					
		a) M-15 grade of concrete	cum	2.350	13016.00	30587.60	Item 12.8 (A)
		b) Steel reinforcement @ 5 kg per sqm	kg	22.080	72.60	1603.05	Item 13.6 /1000
		c) Excavation in soil for foundation	cum	1.680	347.00	582.96	Item No. 3.13
		d) Painting two coats on concrete surface	sqm	9.850	83.00	817.55	Item 8.8
		e) Lettering on km post (average 30 letters of 10 cm height each)	per cm per letter	1800.000	0.70	1260.00	Item 8.3
		<b>Transportation and fixing</b>					
		f) Labour					
		Mate	day	0.260	365.00	94.90	L-12
		Mason	day	0.600	490.00	294.00	L-11
		Mazdoor including loading/unloading	day	6.000	350.00	2100.00	L-13
		g) Machinery					
		Tractor-trolley	hour	6.000	421.20	2527.20	P&M-053
		h) Overhead charges @ 08% on (f+g)				401.29	
		i) Contractor's profit @ 10% on (f+g+h)				541.74	
		Cost for 6 Nos. 5th km stone = a+b+c+ d+e +f+g+h +i				40810.29	
		Rate for each 5th km stone = (a+b+c+ d+e +f+g+h +i ) /6				6801.71	
					<b>say</b>	<b>6802.00</b>	
8.14	(ii)	Ordinary kilometer stone (precast)					
		<i>Unit = Nos.</i>					
		<i>Taking output = 14 Nos.</i>					
		a) M-15 grade of concrete	cum	3.770	13016.00	49070.32	Item 12.8 (A)
		b) Steel reinforcement @ 5 kg per sqm	kg	26.320	72.60	1910.88	Item 13.6 /1000
		c) Excavation in soil for foundation	cum	2.770	347.00	961.19	Item No. 3.13
		d) Painting two coats on concrete surface	sqm	11.410	83.00	947.03	Item 8.8
		e) Lettering on km post ( average 12 letters of 10 cm height each)	per cm per letter	1680.000	0.70	1176.00	Item 8.3
		<b>Transportation and fixing</b>					
		f) Labour					
		Mate	day	0.320	365.00	116.80	L-12
		Mason	day	1.000	490.00	490.00	L-11
		Mazdoor	day	7.000	350.00	2450.00	L-13
		g) Machinery					
		Tractor-trolley	hour	6.000	421.20	2527.20	P&M-053
		h) Overhead charges @ 08% on (f+g)				446.72	
		i) Contractor's profit @ 10% on (f+g+h)				603.07	
		Cost for 14 Nos. ordinary km stone = (a+b+ c +d+e+f+g+h+i)				60699.22	
		Rate for each ordinary km stone = (a+b+ c +d+e+f+g+h+i) /14				4335.66	
					<b>say</b>	<b>4336.00</b>	
8.14	(iii)	Hectometer stone (precast)					
		<i>Unit = Nos.</i>					
		<i>Taking output = 33 Nos.</i>					
		a) M-15 grade of concrete	cum	1.580	13016.00	20565.28	Item 12.8 (A)
		b) Steel reinforcement @ 5 kg per sqm	kg	66.000	72.60	4791.73	Item 13.6 /1000
		c) Excavation in soil for foundation	cum	1.390	347.00	482.33	Item No. 3.13
		d) Painting two coats on concrete surface	sqm	6.270	83.00	520.41	Item 8.8

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Lettering on km post (average 1 letter of 10 cm height each)	per cm per letter	330.000	0.70	231.00	Item 8.3
		Transportation and fixing					
		f) Labour					
		Mate	day	0.340	365.00	124.10	L-12
		Mason	day	1.500	490.00	735.00	L-11
		Mazdoor	day	7.000	350.00	2450.00	L-13
		g) Machinery					
		Tractor-trolley	hour	6.000	421.20	2527.20	P&M-053
		h) Overhead charges @ 08% on (f+g)				466.90	
		i) Contractor's profit @ 10% on (f+g+h)				630.32	
		Cost for 33 Nos. Hectometer stone = (a+b +c +d+e+f+g+h+i)				33524.28	
		Rate for each Hectometer stone = (a+b +c +d+e+f+g+h+i) 33				1015.89	
					say	1016.00	
		Note					The rate for excavation, cement concrete, steel reinforcement, painting and lettering may be taken from respective chapters.
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	365.00	14.60	L-12
		Mazdoor for fixing	day	1.000	350.00	350.00	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	815.81	24474.30	M-091
		Add 10 per cent cost of material for installation				2447.43	
		c) Overhead charges @ 08% on (a+b)				2182.91	
		d) Contractor's profit @ 10% on (a+b+c)				2946.92	
		Cost for 30 Nos. delineators = (a+b+ c+d)				32416.16	
		Rate per delineators = (a+b+c+d) /30				1080.54	
					say	1081.00	
		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	13016.00	16270.00	Item 12.8 (A)
		b) Steel reinforcement	kg	79.800	72.60	5793.64	Item 13.6 /1000
		c) Excavation in soil	cum	10.720	347.00	3719.84	Item No. 3.13
		d) Lettering, each 10 cm high	per letter per cm high	2280.000	0.70	1596.00	Item 8.3
		Transportation and fixing					
		e) Labour					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mate	day	0.570	365.00	208.05	L-12
		Mazdoor	day	14.250	350.00	4987.50	L-13
		<b>f) Machinery</b>					
		Tractor-trolley	hour	6.000	421.20	2527.20	P&M-053
		<b>g) Material</b>					
		Stone spall	cum	11.970	2106.00	25208.82	M-001
		<b>h) Overhead charges @ 08% on (e+f+g)</b>				2634.53	
		<b>i) Contractor's profit @ 10% on (e+f+g+h)</b>				3556.61	
		Cost for 57 Nos. boundary pillar = (a+b +c+d +e+ f+g+h+i )				66502.18	
		<b>Rate for each boundary pillar = (a+b+c+d+e+ f+g+h+i)/57</b>				1166.70	
					<b>say</b>	<b>1167.00</b>	
		<b>Note</b>					
		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	<b>G.I Barbed Wire Fencing 1.2 Metre High</b>					
		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					
		<b>Unit = per running metre</b>					
		Taking output = 30 metres					
		<b>a) Labour</b>					
		Mate	day	0.090	365.00	32.85	L-12
		Blacksmith	day	0.250	490.00	122.50	L-02
		Mazdoor	day	2.000	350.00	700.00	L-13
		<b>b) Material</b>					
		Barbed wire 335 metres length @ 9.38 kg per 100 metres	kg	31.420	55.64	1748.21	M-063
		MS angle iron 40 mm x 40mm x 6 mm, 23 metres in length @ 3.5 kg per metre	kg	80.500	64.33	5178.79	M-179 /1000
		Add for GI staple binding wire, drilling holes etc. @ 2 per cent of the cost of material				138.54	
		<b>c) Painting</b>					
		Applying two coats of painting on exposed surface of angle iron posts ( Rate as per item no. 8.9)	sqm	2.110	73.00	154.03	Item 8.9
		<b>d) Overhead charges @ 08% on (a+b)</b>				633.67	
		<b>e) Contractor's profit @ 10% on (a+b+d)</b>				855.46	
		Cost for 30 metres fencing = a+b+c+d+e				9564.05	
		<b>Rate per metre = (a+b+c+d+e)/30</b>				318.80	
					<b>say</b>	<b>319.00</b>	
		<b>Note</b>					
		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	<b>G.I Barbed Wire Fencing 1.8 Metre High</b>					
		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					
		<b>Unit = per running metre</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Taking output = 30 metres					
		<b>a) Labour</b>					
		Mate	day	0.120	365.00	43.80	L-12
		Blacksmith	day	0.400	490.00	196.00	L-02
		Mazdoor	day	2.500	350.00	875.00	L-13
		<b>b) Material</b>					
		Barbed wire 428 metres length @ 9.38 kg per 100 metres	kg	40.150	55.64	2233.95	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	64.33	9778.59	M-179 /1000
		Add for GI staple, binding wire, drilling holes etc. @ 2 per cent of the cost of material				240.25	
		<b>c) Painting</b>					
		Applying two coats of painting on exposed surface of angle iron posts	sqm	3.960	73.00	289.08	Item 8.9
		<b>d) Overhead charges @ 08% on (a+b)</b>				1069.41	
		<b>e) Contractor's profit @ 10% on (a+b+d)</b>				1443.70	
		Cost for 30 metres fencing = a+b+c+d+e				16169.78	
		<b>Rate per metre fencing = (a+b+c +d+e)/30</b>				538.99	
					<b>say</b>	<b>539.00</b>	
		<b>Note</b> 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.					
8.20	808	<b>Tubular Steel Railing on Medium Weight Steel Channel ( ISMC series) 100 mm x 50 mm</b>					
		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					
		<b>Unit = Running metre</b>					
		Taking output = 10metres					
		<b>i) Excavation for foundation (6 Nos)6 x 0.6 x 0.6 x 0.6</b>	cum	1.296	347.00	449.71	Item No. 3.13
		<b>ii) Foundation concrete M-15 grade PCC 6 x 0.6 x 0.6 x 0.3</b>	cum	0.648	13016.00	8434.37	Item 12.8 (A)
		<b>iii) Painting of pipe</b>	sqm	4.710	73.00	343.83	Item 8.9
		<b>iv) Painting of channel section 6 nos,1.8 metres each 0.2 x 1.8 x 6 = 2.16</b>	sqm	2.160	73.00	157.68	Item 8.9
		<b>a) Labour (For fixing at site)</b>					
		Mate	day	0.010	365.00	3.65	L-12
		Mazdoor	day	0.250	350.00	87.50	L-13
		Plumber	day	0.010	490.00	4.90	L-02
		<b>b) Material</b>					
		Steel pipe 50 mm external dia as per IS:1239	metre	30.000	229.34	6880.20	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	64.33	6392.11	M-179 /1000
		Add for drilling holes @ 2 per cent of cost of channels				127.84	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.040	421.20	16.85	P&M-053
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				1830.54	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				2471.23	
		Cost for 10 metre =i+ii+iii+iv+ a+b+c+d+e				27200.42	
		<b>Rate per metre = (i+ii+iii+iv+a+b+c+d+e)/10</b>				2720.04	
					<b>say</b>	<b>2720.00</b>	
8.21	808	<b>Tubular Steel Railing on Precast RCC Posts, 1.2 m High Above Ground Level</b>					
		Providing, fencing and erecting 50 mm dia painted steel pipe railing in 3 rows on precast M20 grade RCC vertical posts1.8 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					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = Running metre</b>					
		Taking output = 10metres					
		i) Excavation for foundation (6 Nos)6 x 0.6 x 0.6 x 0.6	cum	1.296	347.00	449.71	Item No. 3.13
		ii) Foundation concrete M - 15 grade PCC 6 x 0.6 x 0.6 x 0.3	cum	0.648	13016.00	8434.37	Item 12.8 (A)
		iii) RCC M - 20 for pre cast posts 6 nos of 1.8 metres each	cum	0.320	16056.00	5137.92	Item 14.1(A)
		iv) Painting of pipe	sqm	4.710	73.00	343.83	Item 8.9
		<b>a) Labour</b>					
		Mate	day	0.014	365.00	5.11	L-12
		Mazdoor	day	0.350	350.00	122.50	L-13
		Plumber	day	0.010	490.00	4.90	L-02
		<b>b) Material</b>					
		Steel pipe 50 mm dia as per IS:1239	metre	30.000	229.34	6880.20	M-175
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.250	421.20	105.30	P&M-053
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				569.44	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				768.75	
		Cost for 10 metre =i+ii+iii+iv+ a+b+c+d+e				22822.03	
		<b>Rate per metre = (i+ii+iii+iv+a+b+c+d+e)/10</b>				2282.20	
					<b>say</b>	<b>2282.00</b>	
<b>8.22</b>	<b>809</b>	<b>Reinforced Cement Concrete Crash Barrier</b>					
		Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-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					
		<b>Unit = Linear metre</b>					
		Taking output = 10 m					
		(i) <b>a) M 20 grade concrete</b>					
		M 20 grade concrete	cum	3.000	16056.00	48168.00	Item 14.1(A)
		<b>b) Labour</b>					
		Mate	day	0.040	365.00	14.60	L-12
		Mazdoor	day	1.000	350.00	350.00	L-13
		<b>c) Material</b>					
		HYSD steel reinforcement including dowel bars	tonne	0.280	48832.85	13673.20	M-082
		Pre-moulded asphalt filler board	sqm	0.320	987.63	316.04	M-144
		<b>d) Overhead charges @ 08% on (b+c)</b>				1148.31	
		<b>e) Contractor's profit @ 10% on (b+c+d)</b>				1550.21	
		Cost for 10 metre = a+b+c+d+e				65220.36	
		<b>Rate per metre = (a+b+c+d+e)/10</b>				6522.04	
					<b>say</b>	<b>6522.00</b>	
		<b>Note</b>					
		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.					
<b>8.23</b>	<b>810</b>	<b>Metal Beam Crash Barrier</b>					
	<b>A</b>	<b>Type - A, "W" : Metal Beam Crash Barrier</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 810					
		<b>Unit = Running metre</b>					
		Taking output = 4.5 metre length					
		<b>a) Labour</b>					
		Mate	day	0.060	365.00	21.90	L-12
		Blacksmith	day	0.500	490.00	245.00	L-02
		Mazdoor	day	1.000	350.00	350.00	L-13
		<b>b) Machinery</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Tractor-trolley	hour	0.100	421.20	42.12	P&M-053
		<b>c) Material</b>					
		Corrugated sheet,3 mm thick, "W" beam section railing,4.5 m in length	kg	41.210	64.33	2651.16	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	64.33	5697.32	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	64.33	1044.77	M-179 /1000
		Nuts and bolts	kg	20.000	63.24	1264.81	M-130
		Add 25 per cent of the cost of material for fabrication, nuts, bolts and washers etc.)				2664.51	
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				1118.53	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				1510.01	
		Cost for 4.5 metre = a+b+c+d+e				16610.12	
		<b>Rate per metre = (a+b+c+d+e)/4.5</b>				3691.14	
					<b>say</b>	<b>3691.00</b>	
8.23	B	<b>Type - B, "THRIE" : Metal Beam Crash Barrier</b>					
		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 fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a space of channel section 150 x 75 x 5 mm, 546 mm long complete as per clause 810					
		<b>Unit = Running metre</b>					
		Taking output = 4.5 metre length					
		<b>a) Labour</b>					
		Mate	day	0.060	365.00	21.90	L-12
		Blacksmith	day	0.500	490.00	245.00	L-02
		Mazdoor	day	1.000	350.00	350.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.100	421.20	42.12	P&M-053
		<b>c) Material</b>					
		Corrugated sheet,3 mm thick, "Thrie" beam section railing,4.5 m in length	kg	72.940	48.65	3548.53	M-088
		Channel post 150 x 75 x 5 mm, 2 m long,3 Nos @ 16.4 kg per metre	kg	98.400	64.33	6330.35	M-179 /1000
		Spacer 150 x 75 x 5 mm channel 0.546 m long,3 Nos	kg	26.860	64.33	1727.98	M-179 /1000
		Nuts and bolts	kg	30.000	63.24	1897.22	M-130
		Add 15 per cent of the cost of material for fabrication, nuts, bolts and washers etc.)				2025.61	
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				1295.10	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				1748.38	
		Cost for 4.5 metre = a+b+c+d+e				19232.19	
		<b>Rate per metre= (a+b+c+d+e)/4.5</b>				4273.82	
					<b>say</b>	<b>4274.00</b>	
		<b>Note</b>					
		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.					
8.35	Suggestive	<b>Road Markers/Road Stud with Lense Reflector</b>					
		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					
		<b>Unit = Nos</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Taking output = 50Nos					
		<b>a) Labour</b>					
		Mate	day	0.040	365.00	14.60	L-12
		Mazdoor	day	1.000	350.00	350.00	L-13
		<b>b) Material</b>					
		Aluminium studs 100 x 100 mm fitted with lense reflectors	each	50.000	173.81	8690.50	M-062
		Add 10 per cent of cost of material for fixing and installation				869.05	
		<b>c) Overhead charges @ 08% on (a+b)</b>				793.93	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				1071.81	
		Cost for 50 studs = a+b+c+d				11789.89	
		<b>Rate per studs = (a+b+c+d)/50</b>				235.80	
					<b>say</b>	<b><u>236.00</u></b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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CHAPTER-9							
PIPE CULVERTS							
Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
9.1	408	<b>PCC 1:3:6 in Foundation</b>					
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.640	365.00	233.60	L-12
		Mason	day	1.000	490.00	490.00	L-11
		Mazdoor	day	15.000	350.00	5250.00	L-13
		<b>b) Material</b>					
		40mm Aggregate at site	cum	13.800	3906.27	53906.56	M-055
		Sand at site	cum	6.900	4289.86	29600.01	M-004
		Cement at site	tonne	3.300	10800.63	35642.08	M-081
		Cost of water	KL	18.000	240.00	4320.00	M-189
		<b>c) Machinery</b>					
		Concrete mixer 0.4/ 0.28 cum	hour	6.000	270.00	1620.00	P&M-009
		Generator set 33 KVA	hour	6.000	432.00	2592.00	P&M-079
		Water tanker 6 KL capacity	hour	3.000	150.00	450.00	P&M-060
		<b>d) Overhead charges @ 08% on (a+b+c)</b>				10728.34	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				14483.26	
		Cost for 15 cum = a+b+c+d+e				159315.85	
		<b>Rate per cum = (a+b+c+d+e)/15</b>				10621.06	
						<b>say 10621.00</b>	
		<b>Note</b>					Vibrator is a part of minor T & P which is already included in overhead charges of the contractor.
9.2	2900	<b>Laying Reinforced Cement Concrete Pipe NP4 / Prestressed Concrete Pipe on First Class Bedding in Single Row .</b>					
		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.					
		<b>Unit = metre</b>					
		<b>Taking output = 12.5 metres ( 5 pipes of 2.5 m length each )</b>					
		<b>A 1000 mm dia</b>					
		<b>a) Labour</b>					
		Mate	day	0.180	365.00	65.70	L-12
		Mason	day	0.500	490.00	245.00	L-11
		Mazdoor	day	4.000	350.00	1400.00	L-13
		<b>b) Material</b>					
		Sand at site	cum	0.070	4289.86	300.29	M-004
		Cement at site	tonne	0.050	10800.63	540.03	M-081
		RCC pipe NP-4 /prestressed concrete pipe including collar at site	metre	12.500	2961.97	37024.63	M-149
		Granular material passing 5.6 mm sieve for bedding	cum	4.500	1950.16	8775.73	M-009
		<b>c) Overhead charges @ 08% on (a+b)</b>				3868.11	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				5221.95	
		Cost for 12.5 metres = a+b+c+d				57441.44	
		<b>Rate per metre = (a+b+c+d)/12.5</b>				4595.32	
						<b>say 4595.00</b>	
		<b>Note</b>					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
9.2		<b>B 1200 mm dia</b>					
		<b>a) Labour</b>					
		Mate	day	0.280	365.00	102.20	L-12
		Mason	day	1.000	490.00	490.00	L-11
		Mazdoor	day	6.000	350.00	2100.00	L-13
		<b>b) Material</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Sand at site	cum	0.090	4289.86	386.09	M-004
		Cement at site	tonne	0.070	10800.63	756.04	M-081
		RCC pipe NP-4/prestressed concrete pipe including collar at site	metre	12.500	4210.99	52637.38	M-150
		Granular material passing 5-6 mm sieve for class bedding	cum	5.000	1950.16	9750.81	M-009
		<b>c) Overhead charges @ 08% on (a+b)</b>				5297.80	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				7152.03	
		Cost for 12.5 metres = a+b+c+d				78672.35	
		<b>Rate per metre= (a+b+c+d)/12.5</b>				6293.79	
					<b>say</b>	<b>6294.00</b>	
		<b>Note</b>					
		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	<b>Laying Reinforced Cement Concrete Pipe NP4 / Prestressed Concrete Pipe on First Class Bedding in Double Row .</b>					
		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.					
		<b>Unit = metre</b>					
		<b>Taking output = 12.5 metres ( 10 pipes of 2.5 m length each in two rows.)</b>					
		<b>A</b>					
		<b>1000 mm dia</b>					
		<b>a) Labour</b>					
		Mate	day	0.360	365.00	131.40	L-12
		Mason	day	1.000	490.00	490.00	L-11
		Mazdoor	day	8.000	350.00	2800.00	L-13
		<b>b) Material</b>					
		Sand at site	cum	0.140	4289.86	600.58	M-004
		Cement at site	tonne	0.100	10800.63	1080.06	M-081
		RCC pipe NP-4/prestressed concrete pipe including collar at site	metre	25.000	2961.97	74049.25	M-149
		Granular material passing 5.6 mm sieve for bedding	cum	12.500	1950.16	24377.04	M-009
		<b>c) Overhead charges @ 08% on (a+b)</b>				8282.27	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				11181.06	
		Cost for 12.5 metres = a+b+c+d				122991.65	
		<b>Rate per metre = (a+b+c+d)/12.5</b>				9839.33	
		<b>Note</b>					
		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		<b>B</b>					
		<b>1200 mm dia</b>					
		<b>a) Labour</b>					
		Mate	day	0.560	365.00	204.40	L-12
		Mason	day	2.000	490.00	980.00	L-11
		Mazdoor	day	12.000	350.00	4200.00	L-13
		<b>b) Material</b>					
		Sand at site	cum	0.180	4289.86	772.17	M-004
		Cement at site	tonne	0.140	10800.63	1512.09	M-081
		RCC pipe NP-4 /prestressed concrete pipe including collar at site	metre	25.000	4210.99	105274.75	M-150
		Granular material passing 5-6 mm sieve for class bedding	cum	13.750	1950.16	26814.74	M-009

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Overhead charges @ 08% on (a+b)				11180.65	
		d) Contractor's profit @ 10% on (a+b+c)				15093.88	
		Cost for 12.5 metres = a+b+c+d				166032.68	
		<b>Rate per metre= (a+b+c+d)/12.5</b>				13282.61	
		<b>Note</b>					
		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	<b>13283.00</b>	

CHAPTER-12								
FOUNDATIONS								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.1	304		<b>Excavation for Structures</b>					
			Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.					
		I	<b>Ordinary soil</b>					
			<i>Unit = cum</i>					
			<i>Taking output = 10 cum</i>					
		A	<b>Manual Means</b>					
		(i)	<b>Depth upto 3 m</b>					
		a)	<b>Labour</b>					
			Mate	day	0.14	365.00	51.10	L-12
			Mazdoor	day	3.50	350.00	1225.00	L-13
		b)	<b>Overhead charges @ 20% on (a)</b>				255.22	
		c)	<b>Contractor's profit @ 10% on (a+b)</b>				153.13	
			Cost for 10 cum = a+b+c				1684.45	
			<b>Rate per cum = (a+b+c)/10</b>				168.45	
							<b>say 168.00</b>	
		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)	<b>Depth 3 m to 6 m</b>					
		a)	<b>Labour</b>					
			Mate/Supervisor	day	0.18	365.00	65.70	L-12
			Mazdoor	day	4.50	350.00	1575.00	L-13
		b)	<b>Overhead charges @ 20% on (a)</b>				328.14	
		c)	<b>Contractor's profit @ 10% on (a+b)</b>				196.88	
			Cost for 10 cum = a+b+c				2165.72	
			<b>Rate per cum = (a+b+c)/10</b>				216.57	
							<b>say 217.00</b>	
		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)	<b>Depth above 6 m</b>					
		a)	<b>Labour</b>					
			Mate/Supervisor	day	0.24	365.00	87.60	L-12
			Mazdoor	day	6.00	350.00	2100.00	L-13
		b)	<b>Overhead charges @ 20% on (a)</b>				437.52	
		c)	<b>Contractor's profit @ 10% on (a+b)</b>				262.51	
			Cost for 10 cum = a+b+c				2887.63	
			<b>Rate per cum = (a+b+c)/10</b>				288.76	
							<b>say 289.00</b>	
		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	<b>Mechanical Means</b>					
		(i)	<b>Depth upto 3 m</b>					
			<i>Unit = cum</i>					
			<i>Taking output = 240 cum</i>					
		a)	<b>Labour</b>					
			Mate	day	0.32	365.00	116.80	L-12
			Mazdoor	day	8.00	350.00	2800.00	L-13
		b)	<b>Machinery</b>					
			Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1512.00	9072.00	P&M-026
		c)	<b>Overhead charges @ 20% on (a+b)</b>				2397.76	
		d)	<b>Contractor's profit @ 10% on (a+b+c)</b>				1438.66	
			Cost for 240 cum = a+b+c+d				15825.22	
			<b>Rate per cum = (a+b+c+d)/240</b>				65.94	
							<b>say 66.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Note</b> 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)	<b>Depth 3 m to 6 m</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 210 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.32	365.00	116.80	L-12
		Mazdoor	day	8.00	350.00	2800.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1512.00	9072.00	P&M-026
		<b>c) Overhead charges @ 20% on (a+b)</b>				2397.76	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				1438.66	
		Cost for 210 cum = a+b+c+d				15825.22	
		<b>Rate per cum = (a+b+c+d)/210</b>				75.36	
					<b>say</b>	<b>75.00</b>	
		<b>Note</b> 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)	<b>Depth above 6m</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 180 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.40	365.00	146.00	L-12
		Mazdoor	day	10.00	350.00	3500.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1512.00	9072.00	P&M-026
		<b>c) Overhead charges @ 20% on (a+b)</b>				2543.60	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				1526.16	
		Cost for 180 cum = a+b+c+d				16787.76	
		<b>Rate per cum = (a+b+c+d)/180</b>				93.27	
					<b>say</b>	<b>93.00</b>	
		<b>Note</b> 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	V	<b>Marshy Soil</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 10 cum</b>					
		<b>Depth upto 3 m</b>					
	A	<b>Manual means</b>					
		<b>a) Labour</b>					
		Mate/Supervisor	day	0.40	365.00	146.00	L-12
		Mazdoor	day	10.00	350.00	3500.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley for removal.	hour	2.67	421.20	1124.60	P&M-053
		<b>c) Overhead charges @ 20% on (a+b)</b>				954.12	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				572.47	
		Cost for 10 cum = a+b+c+d				6297.20	
		<b>Rate per cum = (a+b+c+d)/ 10</b>				629.72	
					<b>say</b>	<b>630.00</b>	
		<b>Note</b> 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-IA (ii) to (iii) for ordinary soil					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.1 (V)		B	Mechanical Means					
			a) Labour					
			Mate	day	0.08	365.00	29.20	L-12
			Mazdoor for dressing sides, bottom and backfilling	day	2.00	350.00	700.00	L-13
			b) Machinery					
			Hydraulic excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.17	1512.00	257.04	P&M-026
			Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.45	360.00	162.00	P&M-048
			c) Overhead charges @ 20% on (a+b)				229.65	
			d) Contractor's profit @ 10% on (a+b+c)				137.79	
			Cost for 10 cum = a+b+c+d				1515.68	
			Rate per cum = (a+b+c+d)/10				151.57	
						say	<u>152.00</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-IB (ii) to (iii) for ordinary soil					
		VI	Back Filling in Marshy Foundation Pits					
			Unit : Cum					
			Taking Output : 6 cum					
			a) Labour					
			Mate	day	0.12	365.00	43.80	L-12
			Mazdoor for dressing sides, bottom and backfilling	day	3.00	350.00	1050.00	L-13
			b) Machinery					
			Tractor-trolley for transportation	hour	2.00	421.20	842.40	P&M-053
			c) Overhead charges @ 20% on (a+b)				387.24	
			d) Contractor's profit @ 10% on (a+b+c)				232.34	
			Cost for 6 cum = a+b+c+d				2555.78	
			Rate per cum = (a+b+c+d)/6				425.96	
						say	<u>426.00</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	365.00	3.65	L-12
			Mazdoor	day	0.30	350.00	105.00	L-13
			b) Material					
			Sand (assuming 20 per cent voids)	cum	1.20	4139.86	4967.83	M-006
			c) Overhead charges @ 20% on (a+b)				1015.30	
			d) Contractor's profit @ 10% on (a+b+c)				609.18	
			Rate per cum = a+b+c+d				6700.95	
						say	<u>6701.00</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	365.00	233.60	L-12
			Mason	day	1.00	490.00	490.00	L-11

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		Mazdoor	day	15.00	350.00	5250.00	L-13	
		<b>b) Material</b>						
		40 mm Aggregate	cum	13.50	3906.27	52734.68	M-055	
		coarse Sand	cum	6.75	4289.86	28956.54	M-004	
		cement	tonne	3.45	10800.63	37262.17	M-081	
		Cost of water	KL	18.00	240.00	4320.00	M-189	
		<b>c) Machinery</b>						
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	270.00	1620.00	P&M-009	
		Generator 33 KVA	hour	6.00	432.00	2592.00	P&M-079	
		Water tanker 6 KL capacity	hour	2.00	150.00	300.00	P&M-060	
		<b>d) Overhead charges @ 20% on (a+b+c)</b>				26751.80		
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				16051.08		
		Cost for 15 cum = a+b+c+d+e				176561.86		
		<b>Rate per cum = (a+b+c+d+e)/15</b>				11770.79		
					<b>say</b>	<b>11771.00</b>		
		<b>Note</b>	Vibrator is a part of minor T & P which is already included in overhead charges of the contractor.					
12.8	1500, 1700 & 2100	<b>Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.</b>						
		<b>A</b>						
		<b>PCC Grade M15</b>						
		<b>Unit = cum</b>						
		<b>Taking output = 15 cum</b>						
		<b>a) Material</b>						
		Cement	tonne	4.13	10800.63	44606.60	M-081	
		Coarse sand	cum	6.75	4289.86	28956.54	M-004	
		40 mm Aggregate	cum	8.10	3906.27	31640.81	M-055	
		20 mm Aggregate	cum	4.05	4006.27	16225.40	M-053	
		10 mm Aggregate	cum	1.35	4006.27	5408.47	M-051	
		<b>b) Labour</b>						
		Mate	day	0.86	365.00	313.90	L-12	
		Mason	day	1.50	490.00	735.00	L-11	
		Mazdoor	day	20.00	350.00	7000.00	L-13	
		<b>c) Machinery</b>						
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	270.00	1620.00	P&M-009	
		Generator 63 KVA	hour	6.00	951.39	5708.34	P&M-019	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>9482.00</b>				
		<b>d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery</b>				5688.60		
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				29580.73		
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				17748.44		
		Cost for 15 cum = a+b+c+d+e+f				195232.83		
		<b>Rate per cum = (a+b+c+d+e+f)/15</b>				13015.52		
					<b>say</b>	<b>13016.00</b>		
		<b>Note</b>	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>B</b>						
		<b>PCC Grade M20</b>						
		<b>Unit : cum</b>						
		<b>Taking output = 15 cum</b>						
		<b>a) Material</b>						
		Cement	tonne	5.16	10800.63	55731.25	M-081	
		Coarse sand	cum	6.75	4289.86	28956.54	M-004	
		40 mm Aggregate	cum	5.40	3906.27	21093.87	M-055	
		20 mm Aggregate	cum	5.40	4006.27	21633.87	M-053	
		10 mm Aggregate	cum	2.70	4006.27	10816.94	M-051	
		<b>b) Labour</b>						
		Mate	day	0.86	365.00	313.90	L-12	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mason	day	1.50	490.00	735.00	L-11
		Mazdoor	day	20.00	350.00	7000.00	L-13
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	270.00	1620.00	P&M-009
		Generator 33 KVA	hour	6.00	432.00	2592.00	P&M-079
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>10033.00</b>			
		d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery				6019.73	
		e) Overhead charges @ 20% on (a+b+c+d)				31302.62	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				18781.57	
		Cost for 15 cum = a+b+c+d+e+f				206597.29	
		Rate per cum = (a+b+c+d+e+f)/15				13773.15	
					<b>say</b>	<b>13773.00</b>	
<b>12.8</b>	<b>C</b>	<b>RCC Grade M20</b>					
	<b>Case I</b>	<b>Using Concrete Mixer</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	5.21	10800.63	56271.28	M-081
		Coarse sand	cum	6.75	4289.86	28956.54	M-004
		20 mm Aggregate	cum	8.10	4006.27	32450.81	M-053
		10 mm Aggregate	cum	5.40	4006.27	21633.87	M-051
		<b>b) Labour</b>					
		Mate	day	0.86	365.00	313.90	L-12
		Mason	day	1.50	490.00	735.00	L-11
		Mazdoor	day	20.00	350.00	7000.00	L-13
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	270.00	1620.00	P&M-009
		Generator 33 KVA	hour	6.00	432.00	2592.00	P&M-079
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>10105.00</b>			
		d) Formwork @ 4 per cent on (a+b+c)				6062.94	
		e) Overhead charges @ 20% on (a+b+c+d)				31527.27	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				18916.36	
		Cost for 15 cum = a+b+c+d+e+f				208079.96	
		Rate per cum = (a+b+c+d+e+f)/15				13872.00	
					<b>say</b>	<b>13872.00</b>	
<b>12.8 C</b>	<b>Case II</b>	<b>With Batching Plant, Transit Mixer and Concrete Pump</b>					
		<b>Unit : cum</b>					
		<b>Taking Output = 120 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	41.66	10800.63	449954.25	M-081
		Coarse Sand	cum	54.00	4289.86	231652.29	M-004
		20 mm Aggregate	cum	64.80	4006.27	259606.45	M-053
		10 mm Aggregate	cum	43.20	4006.27	173070.96	M-051
		<b>b) Labour</b>					
		Mate	day	0.84	365.00	306.60	L-12
		Mason	day	3.00	490.00	1470.00	L-11
		Mazdoor	day	18.00	350.00	6300.00	L-13
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2592.00	15552.00	P&M-002
		Generator 100 KVA	hour	6.00	810.00	4860.00	P&M-080
		Loader 1 cum capacity	hour	6.00	936.00	5616.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1080.00	16200.00	P&M-049
		Lead beyond 1 km, L-lead in km	tonne.km	300L	6.44	57960.00	P&M-050 Lead= 30 km
		Concrete Pump	hour	6	297.00	1782.00	P&M-007

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>10203.00</b>			
		d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery				48973.22	
		e) Overhead charges @ 20% on (a+b+c+d)				254660.75	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				152796.45	
		Cost for 120 cum = a+b+c+d+e+f				1680760.97	
		Rate per cum = ( a+b+c+d+e+f )/120				14006.34	
					<b>say</b>	<b>14006.00</b>	
12.8	D	PCC Grade M25					
	Case I	Using Concrete Mixer					
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		a) Material					
		Cement	tonne	5.99	10800.63	64695.77	M-081
		Coarse sand	cum	6.75	4289.86	28956.54	M-004
		40 mm Aggregate	cum	5.40	3906.27	21093.87	M-055
		20 mm Aggregate	cum	5.40	4006.27	21633.87	M-053
		10 mm Aggregate	cum	2.70	4006.27	10816.94	M-051
		b) Labour					
		Mate	day	0.86	365.00	313.90	L-12
		Mason	day	1.50	490.00	735.00	L-11
		Mazdoor	day	20.00	350.00	7000.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	270.00	1620.00	P&M-009
		Generator 33 KVA	hour	6.00	432.00	2592.00	P&M-079
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>10631.00</b>			
		d) Formwork @ 3.75 per cent of (a+b+c)				5979.67	
		e) Overhead charges @ 20% on (a+b+c+d)				33087.51	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				19852.51	
		Cost for 15 cum = a+b+c+d+e+f				218377.57	
		Rate per cum = ( a+b+c+d+e+f )/15				14558.50	
					<b>say</b>	<b>14559.00</b>	
12.8 D	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		<b>Unit : cum</b>					
		<b>Taking Output = 120 cum</b>					
		a) Material					
		Cement	tonne	47.95	10800.63	517890.21	M-081
		Coarse sand	cum	54.00	4289.86	231652.29	M-004
		40 mm Aggregate	cum	43.20	3906.27	168750.96	M-055
		20 mm Aggregate	cum	43.20	4006.27	173070.96	M-053
		10 mm Aggregate	cum	21.60	4006.27	86535.48	M-051
		b) Labour					
		Mate	day	0.84	365.00	306.60	L-12
		Mason	day	3.00	490.00	1470.00	L-11
		Mazdoor	day	18.00	350.00	6300.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2592.00	15552.00	P&M-002
		Generator 100 KVA	hour	6.00	810.00	4860.00	P&M-080
		Loader 1 cum capacity	hour	6.00	936.00	5616.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1080.00	16200.00	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.44	57960.00	P&M-050 Lead= 30 km
		Concrete Pump	hour	6	297.00	1782.00	P&M-007
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>10733.00</b>			
		d) Formwork @ 3.75 per cent of cost of concrete i.e. cost of material, labour and machinery				48297.99	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Overhead charges @ 20% on (a+b+c+d)				267248.90	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				160349.34	
		cost of 120 cum = a+b+c+d+e+f				1763842.74	
		Rate per cum = (a+b+c+d+e+f)/120				14698.69	
					say	<u>14699.00</u>	
12.8	E	RCC Grade M25					
	Case I	Using Concrete Mixer					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Cement	tonne	6.05	10800.63	65343.81	M-081
		Coarse sand	cum	6.75	4289.86	28956.54	M-004
		20 mm Aggregate	cum	8.10	4006.27	32450.81	M-053
		10 mm Aggregate	cum	5.40	4006.27	21633.87	M-051
		b) Labour					
		Mate	day	0.86	365.00	313.90	L-12
		Mason	day	1.50	490.00	735.00	L-11
		Mazdoor	day	20.00	350.00	7000.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	270.00	1620.00	P&M-009
		Generator 33 KVA	hour	6.00	432.00	2592.00	P&M-079
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		10710.00			
		d) Formwork @ 3.75 per cent of a+b+c.				6024.22	
		e) Overhead charges @ 20% on (a+b+c+d)				33334.03	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				20000.42	
		cost of 15 cum = a+b+c+d+e+f				220004.59	
		Rate per cum (a+b+c+d+e+f)/15				14666.97	
					say	<u>14667.00</u>	
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	10800.63	522534.48	M-081
		Coarse sand	cum	54.00	4289.86	231652.29	M-004
		20 mm Aggregate	cum	64.80	4006.27	259606.45	M-053
		10 mm Aggregate	cum	43.20	4006.27	173070.96	M-051
		b) Labour					
		Mate	day	0.84	365.00	306.60	L-12
		Mason	day	3.00	490.00	1470.00	L-11
		Mazdoor	day	18.00	350.00	6300.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2592.00	15552.00	P&M-002
		Generator 100 KVA	hour	6.00	810.00	4860.00	P&M-080
		Loader 1 cum capacity 1 cum	hour	6.00	936.00	5616.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1080.00	16200.00	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.44	57960.00	P&M-050 Lead= 30 km
		Concrete Pump	hour	6.00	297.00	1782.00	P&M-007
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		10808.00			
		d) Formwork @ 3.75 per cent on cost of concrete i.e. cost of material, labour and machinery				48634.15	
		e) Overhead charges @ 20% on (a+b+c+d)				269108.99	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				161465.39	
		cost of 120 cum = a+b+c+d+e+f				1776119.31	
		Rate per cum (a+b+c+d+e+f)/120				14800.99	
					say	<u>14801.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.8	F	PCC Grade M30					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
	a)	Material					
		Cement	tonne	6.08	10800.63	65667.83	M-081
		Coarse sand	cum	6.75	4289.86	28956.54	M-004
		40 mm Aggregate	cum	5.40	3906.27	21093.87	M-055
		20 mm Aggregate	cum	5.40	4006.27	21633.87	M-053
		10 mm Aggregate	cum	2.70	4006.27	10816.94	M-051
	b)	Labour					
		Mate	day	0.86	365.00	313.90	L-12
		Mason	day	1.50	490.00	735.00	L-11
		Mazdoor	day	20.00	350.00	7000.00	L-13
	c)	Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	270.00	1620.00	P&M-009
		Generator 33 KVA	hour	6.00	432.00	2592.00	P&M-079
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>10696.00</b>			
	d)	Formwork @ 3.50 per cent of cost of concrete i.e. cost of material, labour and machinery				5615.05	
	e)	Overhead charges @ 20% on (a+b+c+d)				33209.00	
	f)	Contractor's profit @ 10% on (a+b+c+d+e)				19925.40	
		cost of 15 cum = a+b+c+d+e+f				219179.39	
		Rate per cum (a+b+c+d+e+f)/15				14611.96	
					<b>say</b>	<b>14612.00</b>	
12.8 F	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit : cum</i>					
		<i>Taking Output = 120 cum</i>					
	a)	Material					
		Cement	tonne	48.60	10800.63	524910.62	M-081
		Coarse sand	cum	54.00	4289.86	231652.29	M-004
		40 mm Aggregate	cum	43.20	3906.27	168750.96	M-055
		20 mm Aggregate	cum	43.20	4006.27	173070.96	M-053
		10 mm Aggregate	cum	21.60	4006.27	86535.48	M-051
	b)	Labour					
		Mate	day	0.84	365.00	306.60	L-12
		Mason	day	3.00	490.00	1470.00	L-11
		Mazdoor	day	18.00	350.00	6300.00	L-13
	c)	Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2592.00	15552.00	P&M-002
		Generator 100 KVA	hour	6.00	810.00	4860.00	P&M-080
		Loader 1 cum capacity	hour	6.00	936.00	5616.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1080.00	16200.00	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.44	57960.00	P&M-050 Lead= 30 km
		Concrete Pump	hour	6.00	297.00	1782.00	P&M-007
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>10792.00</b>			
	d)	Formwork @ 3.50 per cent of cost of concrete i.e. cost of material, labour and machinery				45323.84	
	e)	Overhead charges @ 20% on (a+b+c+d)				268058.15	
	f)	Contractor's profit @ 10% on (a+b+c+d+e)				160834.89	
		cost of 120 cum = a+b+c+d+e+f				1769183.80	
		Rate per cum (a+b+c+d+e+f)/120				14743.20	
					<b>say</b>	<b>14743.00</b>	
12.8	G	RCC Grade M30					
	Case I	Using Concrete Mixer					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	6.10	10800.63	65883.84	M-081
		Coarse sand	cum	6.75	4289.86	28956.54	M-004
		20 mm Aggregate	cum	8.10	4006.27	32450.81	M-053
		10 mm Aggregate	cum	5.40	4006.27	21633.87	M-051
		<b>b) Labour</b>					
		Mate	day	0.86	365.00	313.90	L-12
		Mason	day	1.50	490.00	735.00	L-11
		Mazdoor	day	20.00	350.00	7000.00	L-13
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	270.00	1620.00	P&M-009
		Generator 33 KVA	hour	6.00	432.00	2592.00	P&M-079
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>10746.00</b>			
		<b>d) Formwork @ 3.5 per cent on cost of concrete i.e. cost of material, labour and machinery</b>				5641.51	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				33365.49	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				20019.30	
		cost of 15 cum = a+b+c+d+e+f				220212.25	
		<b>Rate per cum = (a+b+c+d+e+f)/15</b>				14680.82	
					<b>say</b>	<b>14681.00</b>	
12.8 G	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<b>Unit = cum</b>					
		<b>Taking output = 120 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	48.80	10800.63	527070.74	M-081
		Coarse sand	cum	54.00	4289.86	231652.29	M-004
		20 mm Aggregate	cum	64.80	4006.27	259606.45	M-053
		10 mm Aggregate	cum	43.20	4006.27	173070.96	M-051
		<b>b) Labour</b>					
		Mate	day	0.84	365.00	306.60	L-12
		Mason	day	3.00	490.00	1470.00	L-11
		Mazdoor	day	18.00	350.00	6300.00	L-13
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2592.00	15552.00	P&M-002
		Generator 100 KVA	hour	6.00	810.00	4860.00	P&M-080
		Loader 1 cum capacity	hour	6.00	936.00	5616.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1080.00	16200.00	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.44	57960.00	P&M-050 Lead= 30 km
		Concrete Pump	hour	6.00	297.00	1782.00	P&M-007
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>10846.00</b>			
		<b>d) Formwork @ 3.5 per cent of cost of concrete i.e. cost of material, labour and machinery</b>				45550.65	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				269399.54	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				161639.72	
		cost of 120 cum = a+b+c+d+e+f				1778036.95	
		<b>Rate per cum (a+b+c+d+e+f)/120</b>				14816.97	
					<b>say</b>	<b>14817.00</b>	
12.8	H	RCC Grade M35					
	Case I	Using Concrete Mixer					
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	6.33	10800.63	68367.99	M-081

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Coarse sand	cum	6.75	4289.86	28956.54	M-004
		20 mm Aggregate	cum	8.10	4006.27	32450.81	M-053
		10 mm Aggregate	cum	5.40	4006.27	21633.87	M-051
		<b>b) Labour</b>					
		Mate	day	0.86	365.00	313.90	L-12
		Mason	day	1.50	490.00	735.00	L-11
		Mazdoor	day	20.00	350.00	7000.00	L-13
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	270.00	1620.00	P&M-009
		Generator 33 KVA	hour	6.00	432.00	2592.00	P&M-079
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>10912.00</b>			
		<b>d) Formwork @ 3 per cent on a+b+c</b>				4910.10	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				33716.04	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				20229.62	
		cost of 15 cum = a+b+c+d+e+f				222525.87	
		<b>Rate per cum = (a+b+c+d+e+f)/15</b>				14835.06	
					<b>say</b>	<b>14835.00</b>	
12.8 H		<b>Case II Using Batching Plant, Transit Mixer and Concrete Pump</b>					
		<b>Unit ; cum</b>					
		<b>Taking Output = 120 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	50.64	10800.63	546943.90	M-081
		Coarse sand	cum	54.00	4289.86	231652.29	M-004
		20 mm Aggregate	cum	64.80	4006.27	259606.45	M-053
		10 mm Aggregate	cum	43.20	4006.27	173070.96	M-051
		<b>b) Labour</b>					
		Mate	day	0.84	365.00	306.60	L-12
		Mason	day	3.00	490.00	1470.00	L-11
		Mazdoor	day	18.00	350.00	6300.00	L-13
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2592.00	15552.00	P&M-002
		Generator 100 KVA	hour	6.00	810.00	4860.00	P&M-080
		Loader 1 cum capacity	hour	6.00	936.00	5616.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1080.00	16200.00	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.44	57960.00	P&M-050 Lead= 30 km
		Concrete Pump	hour	6.00	297.00	1782.00	P&M-007
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>11012.00</b>			
		<b>d) Formwork @ 3 per cent on cost of concrete i.e. cost of material, labour and machinery</b>				39639.61	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				272191.96	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				163315.18	
		cost of 120 cum = a+b+c+d+e+f				1796466.95	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				14970.56	
					<b>say</b>	<b>14971.00</b>	
		<b>Note:</b> 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.					
12.40	1600	<b>Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications.</b>					
		<b>Unit = 1 MT</b>					
		<b>Taking output = 1 MT</b>					
		<b>a) Material</b>					
		HYSD bars including 5 per cent overlaps and wastage	tonne	1.05	48832.85	51274.49	M-082
		Binding wire	Kg	6.00	58.24	349.44	M-072

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Labour for cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.40	365.00	146.00	L-12
		Blacksmith	day	2.00	490.00	980.00	L-02
		Mazdoor	day	6.00	350.00	2100.00	L-13
						10969.99	
						6581.99	
						72401.92	
					<b>say</b>	<b><u>72402.00</u></b>	

CHAPTER-13								
SUB-STRUCTURE								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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 )					
			<b>Unit = cum</b>					
			<b>Taking output = 1 cum</b>					
		a)	Material					
			Stone	cum	1.00	1124.00	1124.00	M-148
			Through and bond stone	No	7.00	30.00	210.00	M-182
			(7no.x0.24mx0.24mx0.39m = 0.16 cu.m)					
			Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.33	10342.00	3412.86	Item 12.6 (A)
		b)	Labour					
			Mate	day	0.10	365.00	36.50	L-12
			Mason	day	1.20	490.00	588.00	L-11
			Mazdoor	day	1.20	350.00	420.00	L-13
			Add for scaffolding @ 5 per cent of cost of a) Material and b) Labour				289.57	
		c)	Overhead charges @ 20% on (a+b)				1216.19	
		d)	Contractor's profit @ 10% on (a+b+c)				729.71	
			Rate per cum (a+b+c+d)				8026.82	
						say	<b>8027.00</b>	
13.5	1500, 1700 & 2200		Plain/Reinforced cement concrete in sub-structure complete as per drawing and Technical Specifications					
			<b>Unit = cum</b>					
			<b>Taking output = 1 cum</b>					
		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)				9482.00	Item 12.8 (A)
			d) formwork					
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		948.20	
		e)	Overhead charges @ 20% on (a+b+c+d)				2086.04	
		f)	Contractor's profit @ 10% on (a+b+c+d+e)				1251.62	
			Rate perm (a+b+c+d+e+f)				13767.86	
						say	<b>13768.00</b>	
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)				10033.00	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		1003.30	
		e)	Overhead charges @ 20% on (a+b+c+d)				2207.26	
		f)	Contractor's profit @ 10% on (a+b+c+d+e)				1324.36	
			Rate perm (a+b+c+d+e+f)				14567.92	
						say	<b>14568.00</b>	
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					

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) of Item 12.8 (D) Case I				10631.00	Item 12.8 (D)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		1063.10	
		e) Overhead charges @ 20% on (a+b+c+d)				2338.82	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1403.29	
		Rate perm (a+b+c+d+e+f)				15436.21	
					say	<u>15436.00</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				10733.00	Item 12.8 (D)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		1073.30	
		e) Overhead charges @ 20% on (a+b+c+d)				2361.26	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1416.76	
		Rate perm (a+b+c+d+e+f)				15584.32	
					say	<u>15584.00</u>	
13.5 C	(q)	Height 5m to 10m					
		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				10631.00	Item 12.8 (D)
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		1275.72	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		212.62	
		e) Overhead charges @ 20% on (a+b+c+d)				2423.87	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1454.32	
		Rate perm (a+b+c+d+e+f)				15997.53	
					say	<u>15998.00</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				10733.00	
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		1287.96	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		214.66	
		e) Overhead charges @ 20% on (a+b+c+d)				2447.12	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1468.27	
		Rate perm (a+b+c+d+e+f)				16151.02	
					say	<u>16151.00</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				10631.00	Item 12.8 (D)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1594.65	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		425.24	
		e) Overhead charges @ 20% on (a+b+c+d)				2530.18	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1518.11	
		Rate perm (a+b+c+d+e+f)				16699.17	
					say	<u>16699.00</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				10733.00	Item 12.8 (D)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1609.95	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		429.32	
		e) Overhead charges @ 20% on (a+b+c+d)				2554.45	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1532.67	
		Rate perm (a+b+c+d+e+f)				16859.40	
					say	<u>16859.00</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				10696.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		1069.60	
		e) Overhead charges @ 20% on (a+b+c+d)				2353.12	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1411.87	
		Rate perm (a+b+c+d+e+f)				15530.59	
					say	<u>15531.00</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				10792.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		1079.20	
		e) Overhead charges @ 20% on (a+b+c+d)				2374.24	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1424.54	
		Rate perm (a+b+c+d+e+f)				15669.98	
					say	<u>15670.00</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				10696.00	
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		1283.52	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		213.92	
		e) Overhead charges @ 20% on (a+b+c+d)				2438.69	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1463.21	
		Rate perm (a+b+c+d+e+f)				16095.34	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
					say	<u>16095.00</u>	
13.5 D (g)	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				10792.00	
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		1295.04	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		215.84	
		e) Overhead charges @ 20% on (a+b+c+d)				2460.58	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1476.35	
		Rate perm (a+b+c+d+e+f)				16239.80	
					say	<u>16240.00</u>	
13.5 D	(r)	Height above 10m					
		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				10696.00	
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1604.40	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		427.84	
		e) Overhead charges @ 20% on (a+b+c+d)				2545.65	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1527.39	
		Rate perm (a+b+c+d+e+f)				16801.28	
					say	<u>16801.00</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				10792.00	
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1618.80	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		431.68	
		e) Overhead charges @ 20% on (a+b+c+d)				2568.50	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1541.10	
		Rate perm (a+b+c+d+e+f)				16952.07	
					say	<u>16952.00</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				10105.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		1010.50	
		e) Overhead charges @ 20% on (a+b+c+d)				2223.10	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1333.86	
		Rate perm (a+b+c+d+e+f)				14672.46	
					say	<u>14672.00</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				10203.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		1020.30	
		e) Overhead charges @ 20% on (a+b+c+d)				2244.66	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1346.80	
		Rate perm (a+b+c+d+e+f)				14814.76	
					say	<u>14815.00</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				10105.00	
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		1212.60	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		202.10	
		e) Overhead charges @ 20% on (a+b+c+d)				2303.94	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1382.36	
		Rate perm (a+b+c+d+e+f)				15206.00	
					say	<u>15206.00</u>	
13.5 E	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
(g)		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case II				10203.00	
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		1224.36	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		204.06	
		e) Overhead charges @ 20% on (a+b+c+d)				2326.28	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1395.77	
		Rate perm (a+b+c+d+e+f)				15353.47	
					say	<u>15353.00</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				10105.00	
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1515.75	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		404.20	
		e) Overhead charges @ 20% on (a+b+c+d)				2404.99	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1442.99	
		Rate perm (a+b+c+d+e+f)				15872.93	
					say	<u>15873.00</u>	
13.5 E	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
(r)		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case II				10203.00	
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1530.45	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		408.12	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Overhead charges @ 20% on (a+b+c+d)				2428.31	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1456.99	
		Rate perm (a+b+c+d+e+f)				16026.87	
					say	<u>16027.00</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				10710.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		1071.00	
		e) Overhead charges @ 20% on (a+b+c+d)				2356.20	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1413.72	
		Rate perm (a+b+c+d+e+f)				15550.92	
					say	<u>15551.00</u>	
13.5 F	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 (E) Case II				11063.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		1106.30	
		e) Overhead charges @ 20% on (a+b+c+d)				2433.86	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1460.32	
		Rate perm (a+b+c+d+e+f)				16063.48	
					say	<u>16063.00</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				10710.00	
		d) formwork					
		Add 11.8 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.80		1263.78	
		Add 1.8 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.80		192.78	
		e) Overhead charges @ 20% on (a+b+c+d)				2433.31	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1459.99	
		Rate perm (a+b+c+d+e+f)				16059.86	
					say	<u>16060.00</u>	
13.5 F	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 (E) Case II				11063.00	
		d) formwork					
		Add 11.8 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.80		1305.43	
		Add 1.8 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.80		199.13	
		e) Overhead charges @ 20% on (a+b+c+d)				2513.51	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1508.11	
		Rate perm (a+b+c+d+e+f)				16589.19	
					say	<u>16589.00</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					

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) of Item 12.8 (E) Case I				10710.00	
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1606.50	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		428.40	
		e) Overhead charges @ 20% on (a+b+c+d)				2548.98	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1529.39	
		Rate perm (a+b+c+d+e+f)				16823.27	
							say <u>16823.00</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				11063.00	
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		1659.45	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		442.52	
		e) Overhead charges @ 20% on (a+b+c+d)				2632.99	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1579.80	
		Rate perm (a+b+c+d+e+f)				17377.76	
							say <u>17378.00</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				10746.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		1074.60	
		e) Overhead charges @ 20% on (a+b+c+d)				2364.12	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1418.47	
		Rate perm (a+b+c+d+e+f)				15603.19	
							say <u>15603.00</u>
13.5 G (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 (G) Case II				10846.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		1084.60	
		e) Overhead charges @ 20% on (a+b+c+d)				2386.12	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1431.67	
		Rate perm (a+b+c+d+e+f)				15748.39	
							say <u>15748.00</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				10746.00	
		d) formwork					
		Add 11.5 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.50		1235.79	
		Add 1.6 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.60		171.94	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Overhead charges @ 20% on (a+b+c+d)				2430.75	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1458.45	
		Rate perm (a+b+c+d+e+f)				16042.92	
					say	<u>16043.00</u>	
13.5 G (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 (G) Case II				10846.00	
		d) formwork					
		Add 11.5 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.50		1247.29	
		Add 1.6 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.60		173.54	
		e) Overhead charges @ 20% on (a+b+c+d)				2453.37	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1472.02	
		Rate perm (a+b+c+d+e+f)				16192.21	
					say	<u>16192.00</u>	
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				10746.00	
		d) formwork					
		Add 14 per cent of cost of material, labour and machinery (a+b+c) for Formwork		14.00		1504.44	
		Add 3.5 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.50		376.11	
		e) Overhead charges @ 20% on (a+b+c+d)				2525.31	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1515.19	
		Rate perm (a+b+c+d+e+f)				16667.05	
					say	<u>16667.00</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				10846.00	
		d) formwork					
		Add 14 per cent of cost of material, labour and machinery (a+b+c) for Formwork		14.00		1518.44	
		Add 3.5 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.50		379.61	
		e) Overhead charges @ 20% on (a+b+c+d)				2548.81	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1529.29	
		Rate perm (a+b+c+d+e+f)				16822.15	
					say	<u>16822.00</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				10912.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		1091.20	
		e) Overhead charges @ 20% on (a+b+c+d)				2400.64	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1440.38	
		Rate perm (a+b+c+d+e+f)				15844.22	
					say	<u>15844.00</u>	
13.5 H (p)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					

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) of Item 12.8 (H) Case II				11278.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		1127.80	
		e) Overhead charges @ 20% on (a+b+c+d)				2481.16	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1488.70	
		Rate perm (a+b+c+d+e+f)				16375.66	
					say	<u>16376.00</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				10912.00	
		d) formwork					
		Add 11 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.00		1200.32	
		Add 1.4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.40		152.77	
		e) Overhead charges @ 20% on (a+b+c+d)				2453.02	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1471.81	
		Rate perm (a+b+c+d+e+f)				16189.92	
					say	<u>16190.00</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				11278.00	
		d) formwork					
		Add 11 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.00		1240.58	
		Add 1.4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.40		157.89	
		e) Overhead charges @ 20% on (a+b+c+d)				2535.29	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1521.18	
		Rate perm (a+b+c+d+e+f)				16732.94	
					say	<u>16733.00</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				10912.00	
		d) formwork					
		Add 13 per cent of cost of material, labour and machinery (a+b+c) for Formwork		13.00		1418.56	
		Add 3 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.00		327.36	
		e) Overhead charges @ 20% on (a+b+c+d)				2531.58	
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1518.95	
		Rate perm (a+b+c+d+e+f)				16708.45	
					say	<u>16708.00</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				11278.00	
		d) formwork					
		Add 13 per cent of cost of material, labour and machinery (a+b+c) for Formwork		13.00		1466.14	
		Add 3 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.00		338.34	
		e) Overhead charges @ 20% on (a+b+c+d)				2616.50	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		f) Contractor's profit @ 10% on (a+b+c+d+e)				1569.90	
		Rate perm (a+b+c+d+e+f)				17268.87	
					say	<u>17269.00</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.					
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	48832.85	51274.49	M-082
		Binding wire	kg	6.00	58.24	349.44	M-072
		b) Labour for cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.34	365.00	124.10	L-12
		Blacksmith	day	2.00	490.00	980.00	L-02
		Mazdoor	day	6.50	350.00	2275.00	L-13
		c) Overhead charges @ 20% on (a+b)				11000.61	
		d) Contractor's profit @ 10% on (a+b+c)				6600.36	
		Rate for per MT (a+b+c+d)				72604.01	
					say	<u>72604.00</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	56032.85	58834.49	M-126
		Binding wire	kg	6.00	58.24	349.44	M-072
		b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.28	365.00	102.20	L-12
		Blacksmith	day	1.50	490.00	735.00	L-02
		Mazdoor	day	5.50	350.00	1925.00	L-13
		c) Overhead charges @ 20% on (a+b)				12389.23	
		d) Contractor's profit @ 10% on (a+b+c)				7433.54	
		Rate for per MT (a+b+c+d)				81768.90	
					say	<u>81769.00</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	50.00	1575.00	M-056
		Average length of weep hole is taken as one metre for the purpose of estimating.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		MS clamp	each.	30.00	33.26	997.80	M-123
		collar for AC pipe (average) taking 10% of above pipe rate	each.	10.00	5.00	50.00	M-056/10
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.05	10342.00	517.10	Item 12.6 (A)
		<b>b) Labour</b>					
		Mate	day	0.03	365.00	10.95	L-12
		Mason	day	0.50	490.00	245.00	L-11
		Mazdoor	day	0.25	350.00	87.50	L-13
		<b>c) Overhead charges @ 20% on (a+b)</b>				696.67	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				418.00	
		Cost for 30 m = a+b+c+d				4598.02	
		<b>Rate per m (a+b+c+d)/30</b>				153.27	
					<b>say</b>	<b>153.00</b>	
	<b>Note</b>	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	<b>Back filling behind abutment, wing wall and return wall complete as per drawing and Technical Specification</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 10 cum</b>					
	<b>A</b>	<b>Granular material</b>					
		<b>a) Labour</b>					
		Mate	day	0.28	365.00	102.20	L-12
		Mazdoor	day	7.00	350.00	2450.00	L-13
		<b>b) Material</b>					
		Granular material	cum	12.00	1950.16	23401.95	M-009
		<b>c) Machinery</b>					
		Plate compactor/power rammer	hour	2.50	417.78	1044.45	P&M-086
		Water Tanker	hour	0.05	150.00	7.50	P&M-060
		<b>d) Overhead charges @ 20% on (a+b+c)</b>				5401.22	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				3240.73	
		Cost for 10 cum of granular backfill = a+b+c+d+e				35648.06	
		<b>Rate per cum = (a+b+c+d+e)/10</b>				3564.81	
					<b>say</b>	<b>3565.00</b>	
13.9	<b>B</b>	<b>Sandy material</b>					
		<b>a) Labour</b>					
		Mate	day	0.28	365.00	102.20	L-12
		Mazdoor for filling, watering, ramming etc.	day	7.00	350.00	2450.00	L-13
		<b>b) Material</b>					
		Sand	cum	12.00	4139.86	49678.29	M-006
		<b>c) Machinery</b>					
		Plate compactor/power rammer	hour	2.50	417.78	1044.45	P&M-086
		Water Tanker	hour	0.06	150.00	9.00	P&M-060
		<b>d) Overhead charges @ 20% on (a+b+c)</b>				10656.79	
		<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				6394.07	
		Cost for 10 cum of sandy backfill = a+b+c+d+e				70334.80	
		<b>Rate per cum = (a+b+c+d+e)/10</b>				7033.48	
					<b>say</b>	<b>7033.00</b>	

**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					
			<i>Unit = 1 cum</i>					
			<i>Taking output = 15 cum</i>					
			<b>a) Material</b>					
			Cement	tonne	5.12	10800.63	55299.23	M-081
			Coarse sand	cum	6.75	4289.86	28956.54	M-004
			20 mm Aggregate	cum	8.10	4006.27	32450.81	M-053
			10 mm Aggregate	cum	5.40	4006.27	21633.87	M-051
			<b>b) Labour</b>					
			Mate	day	0.86	365.00	313.90	L-12
			Mason	day	1.50	490.00	735.00	L-11
			Mazdoor	day	20.00	350.00	7000.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	270.00	1620.00	P&M-009
			Generator 33 KVA	hour	6.00	432.00	2592.00	P&M-079
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>		<b>150602.00</b>			
			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				150602.00	
			<b>d) Formwork and staging 20 per cent of (a+b+c)</b>				30120.40	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				36144.48	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				21686.69	
			Cost for 15 cum = a+b+c+d+e+f				238553.57	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				15903.57	
						<b>say</b>	<b>15904.00</b>	
14.1A Case I (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				150602.00	
			<b>d) Formwork and staging 25 per cent of (a+b+c)</b>				37650.50	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				37650.50	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				22590.30	
			Cost for 15 cum = a+b+c+d+e+f				248493.30	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				16566.22	
						<b>say</b>	<b>16566.00</b>	
14.1A Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				150602.00	
			<b>d) Formwork and staging 30 per cent of (a+b+c)</b>				45180.60	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				39156.52	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				23493.91	
			Cost for 15 cum = a+b+c+d+e+f				258433.03	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				17228.87	
						<b>say</b>	<b>17229.00</b>	
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				150602.00	
			d) Formwork and staging 25 per cent of (a+b+c)				37650.50	
			e) Overhead charges @ 20% on (a+b+c+d)				37650.50	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				22590.30	
			Cost for 15 cum = a+b+c+d+e+f				248493.30	
			Rate per cum = (a+b+c+d+e+f)/15				16566.22	
							<b>say</b>	<b><u>16566.00</u></b>
14.1A Case I (ii)	(q)		<b>Height 5m to 10m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				150602.00	
			d) Formwork and staging 30 per cent of (a+b+c)				45180.60	
			e) Overhead charges @ 20% on (a+b+c+d)				39156.52	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				23493.91	
			Cost for 15 cum = a+b+c+d+e+f				258433.03	
			Rate per cum = (a+b+c+d+e+f)/15				17228.87	
							<b>say</b>	<b><u>17229.00</u></b>
14.1A Case I (ii)	(r)		<b>Height above 10m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				150602.00	
			d) Formwork and staging 35 per cent of (a+b+c)				52710.70	
			e) Overhead charges @ 20% on (a+b+c+d)				40662.54	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				24397.52	
			Cost for 15 cum = a+b+c+d+e+f				268372.76	
			Rate per cum = (a+b+c+d+e+f)/15				17891.52	
							<b>say</b>	<b><u>17892.00</u></b>
14.1A	Case II		<b>Using Batching Plant, Transit Mixer and Concrete Pump</b>					
			<b>Unit = cum</b>					
			<b>Taking output = 120 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	40.92	10800.63	441961.78	M-081
			Coarse sand	cum	54.00	4289.86	231652.29	M-004
			20 mm Aggregate	cum	64.80	4006.27	259606.45	M-053
			10 mm Aggregate	cum	43.20	4006.27	173070.96	M-051
			<b>b) Labour</b>					
			Mate	day	0.84	365.00	306.60	L-12
			Mason	day	3.00	490.00	1470.00	L-11
			Mazdoor	day	18.00	350.00	6300.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2592.00	15552.00	P&M-002
			Generator 100 KVA	hour	6.00	810.00	4860.00	P&M-080
			Loader	hour	6.00	936.00	5616.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1080.00	16200.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.44	57960.00	Lead =30 km & P&M-050
			Concrete Pump	hour	6.00	297.00	1782.00	P&M-007
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>			<b>1216339.00</b>		
			<b>For formwork and staging add the following:</b>					
14.1A Case II	(i)		<b>For solid slab super-structure, 20-30 per cent of (a+b+c)</b>					
	(p)		<b>Height upto 5m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1216339.00	
			d) Formwork and staging 20 per cent of (a+b+c)				243267.80	

			e) Overhead charges @ 20% on (a+b+c+d)			291921.36	
			f) Contractor's profit @ 10% on (a+b+c+d+e)			175152.82	
			Cost for 120 cum = a+b+c+d+e+f			1926680.98	
			Rate per cum = (a+b+c+d+e+f)/120			16055.67	
						say	<u>16056.00</u>
14.1A Case II (i)	(q)		Height 5m to 10m				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1216339.00	
			d) Formwork and staging 25 per cent of (a+b+c)			304084.75	
			e) Overhead charges @ 20% on (a+b+c+d)			304084.75	
			f) Contractor's profit @ 10% on (a+b+c+d+e)			182450.85	
			Cost for 120 cum = a+b+c+d+e+f			2006959.35	
			Rate per cum = (a+b+c+d+e+f)/120			16724.66	
						say	<u>16725.00</u>
14.1A Case II (i)	(r)		Height above 10m				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1216339.00	
			d) Formwork and staging 30 per cent of (a+b+c)			364901.70	
			e) Overhead charges @ 20% on (a+b+c+d)			316248.14	
			f) Contractor's profit @ 10% on (a+b+c+d+e)			189748.88	
			Cost for 120 cum = a+b+c+d+e+f			2087237.72	
			Rate per cum = (a+b+c+d+e+f)/120			17393.65	
						say	<u>17394.00</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			1216339.00	
			d) Formwork and staging 25 per cent of (a+b+c)			304084.75	
			e) Overhead charges @ 20% on (a+b+c+d)			304084.75	
			f) Contractor's profit @ 10% on (a+b+c+d+e)			182450.85	
			Cost for 120 cum = a+b+c+d+e+f			2006959.35	
			Rate per cum = (a+b+c+d+e+f)/120			16724.66	
						say	<u>16725.00</u>
14.1A Case II (ii)	(q)		Height 5m to 10m				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1216339.00	
			d) Formwork and staging 30 per cent of (a+b+c)			364901.70	
			e) Overhead charges @ 20% on (a+b+c+d)			316248.14	
			f) Contractor's profit @ 10% on (a+b+c+d+e)			189748.88	
			Cost for 120 cum = a+b+c+d+e+f			2087237.72	
			Rate per cum = (a+b+c+d+e+f)/120			17393.65	
						say	<u>17394.00</u>
14.1A Case II (ii)	(r)		Height above 10m				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1216339.00	
			d) Formwork and staging 35 per cent of (a+b+c)			425718.65	
			e) Overhead charges @ 20% on (a+b+c+d)			328411.53	
			f) Contractor's profit @ 10% on (a+b+c+d+e)			197046.92	
			Cost for 120 cum = a+b+c+d+e+f			2167516.10	
			Rate per cum = (a+b+c+d+e+f)/120			18062.63	
						say	<u>18063.00</u>
14.1	B		RCC Grade M25				
	Case I		Using Concrete Mixer				
			Unit = 1 cum				

			<b>Taking output = 15 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	5.99	10800.63	64695.77	M-081
			Coarse sand	cum	6.75	4289.86	28956.54	M-004
			20 mm Aggregate	cum	8.10	4006.27	32450.81	M-053
			10 mm Aggregate	cum	5.40	4006.27	21633.87	M-051
			<b>b) Labour</b>					
			Mate	day	0.86	365.00	313.90	L-12
			Mason	day	1.50	490.00	735.00	L-11
			Mazdoor	day	20.00	350.00	7000.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	270.00	1620.00	P&M-009
			Generator 33 KVA	hour	6.00	432.00	2592.00	P&M-079
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>		<b>159998.00</b>			
			<b>For formwork and staging add the following:</b>					
14.1B Case I	(i)		<b>For solid slab super-structure, 20-30 per cent of (a+b+c)</b>					
	(p)		<b>Height upto 5m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				159998.00	
			<b>d) Formwork and staging 20 per cent of (a+b+c)</b>				31999.60	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				38399.52	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				23039.71	
			Cost for 15 cum = a+b+c+d+e+f				253436.83	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				16895.79	
							<b>say</b>	<b><u>16896.00</u></b>
14.1B Case I (i)	(q)		<b>Height 5m to 10m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				159998.00	
			<b>d) Formwork and staging 25 per cent of (a+b+c)</b>				39999.50	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				39999.50	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				23999.70	
			Cost for 15 cum = a+b+c+d+e+f				263996.70	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				17599.78	
							<b>say</b>	<b><u>17600.00</u></b>
14.1B Case I (i)	(r)		<b>Height above 10m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				159998.00	
			<b>d) Formwork and staging 30 per cent of (a+b+c)</b>				47999.40	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				41599.48	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				24959.69	
			Cost for 15 cum = a+b+c+d+e+f				274556.57	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				18303.77	
							<b>say</b>	<b><u>18304.00</u></b>
14.1B Case I	(ii)		<b>For T-beam &amp; slab, 25-35 per cent of (a+b+c)</b>					
	(p)		<b>Height upto 5m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				159998.00	
			<b>d) Formwork and staging 25 per cent of (a+b+c)</b>				39999.50	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				39999.50	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				23999.70	
			Cost for 15 cum = a+b+c+d+e+f				263996.70	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				17599.78	
							<b>say</b>	<b><u>17600.00</u></b>

14.1B Case I (ii)	(q)	<b>Height 5m to 10m</b>						
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum						159998.00
		<b>d) Formwork and staging 30 per cent of (a+b+c)</b>						47999.40
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>						41599.48
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>						24959.69
		Cost for 15 cum = a+b+c+d+e+f						274556.57
		<b>Rate per cum = (a+b+c+d+e+f)/15</b>						18303.77
							<b>say</b>	<b>18304.00</b>
14.1B Case I (ii)	(r)	<b>Height above 10m</b>						
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum						159998.00
		<b>d) Formwork and staging 35 per cent of (a+b+c)</b>						55999.30
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>						43199.46
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>						25919.68
		Cost for 15 cum = a+b+c+d+e+f						285116.44
		<b>Rate per cum = (a+b+c+d+e+f)/15</b>						19007.76
							<b>say</b>	<b>19008.00</b>
14.1B	Case II	<b>Using Batching Plant, Transit Mixer and Concrete Pump</b>						
		<b>Unit = cum</b>						
		<b>Taking output = 120 cum</b>						
		<b>a) Material</b>						
		Cement	tonne	47.95	10800.63	517890.21		M-081
		Coarse sand	cum	54.20	4289.86	232510.26		M-004
		20 mm Aggregate	cum	64.80	4006.27	259606.45		M-053
		10 mm Aggregate	cum	43.20	4006.27	173070.96		M-051
		<b>b) Labour</b>						
		Mate	day	0.84	365.00	306.60		L-12
		Mason	day	3.00	490.00	1470.00		L-11
		Mazdoor	day	18.00	350.00	6300.00		L-13
		<b>c) Machinery</b>						
		Batching Plant @ 20 cum/hour	hour	6.00	2592.00	15552.00		P&M-002
		Generator 100 KVA	hour	6.00	432.00	2592.00		P&M-079
		Loader	hour	6.00	936.00	5616.00		P&M-017
		Transit Mixer ( capacity 4.0 cu.m )						
		Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1080.00	16200.00		P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.44	57960.00		Lead =30 km & P&M-050
		Concrete Pump	hour	6.00	297.00	1782.00		P&M-007
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>			<b>1290857.00</b>			
		<b>For formwork and staging add the following:</b>						
14.1B Case II	(i)	<b>For solid slab super-structure, 20-30 per cent of (a+b+c)</b>						
	(p)	<b>Height upto 5m</b>						
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum						1290857.00
		<b>d) Formwork and staging 20 per cent of (a+b+c)</b>						258171.40
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>						309805.68
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>						185883.41
		Cost for 120 cum = a+b+c+d+e+f						2044717.49
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>						17039.31
							<b>say</b>	<b>17039.00</b>
14.1B Case II (i)	(q)	<b>Height 5m to 10m</b>						

			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1290857.00	
			d) Formwork and staging 25 per cent of (a+b+c)				322714.25	
			e) Overhead charges @ 20% on (a+b+c+d)				322714.25	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				193628.55	
			Cost for 120 cum = a+b+c+d+e+f				2129914.05	
			Rate per cum = (a+b+c+d+e+f)/120				17749.28	
							say	<u>17749.00</u>
14.1B Case II (i)	(r)		Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1290857.00	
			d) Formwork and staging 30 per cent of (a+b+c)				387257.10	
			e) Overhead charges @ 20% on (a+b+c+d)				335622.82	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				201373.69	
			Cost for 120 cum = a+b+c+d+e+f				2215110.61	
			Rate per cum = (a+b+c+d+e+f)/120				18459.26	
							say	<u>18459.00</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				1290857.00	
			d) Formwork and staging 25 per cent of (a+b+c)				322714.25	
			e) Overhead charges @ 20% on (a+b+c+d)				322714.25	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				193628.55	
			Cost for 120 cum = a+b+c+d+e+f				2129914.05	
			Rate per cum = (a+b+c+d+e+f)/120				17749.28	
							say	<u>17749.00</u>
14.1B Case II (ii)	(q)		Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1290857.00	
			d) Formwork and staging 30 per cent of (a+b+c)				387257.10	
			e) Overhead charges @ 20% on (a+b+c+d)				335622.82	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				201373.69	
			Cost for 120 cum = a+b+c+d+e+f				2215110.61	
			Rate per cum = (a+b+c+d+e+f)/120				18459.26	
							say	<u>18459.00</u>
14.1B Case II (ii)	(r)		Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1290857.00	
			d) Formwork and staging 35 per cent of (a+b+c)				451799.95	
			e) Overhead charges @ 20% on (a+b+c+d)				348531.39	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				209118.83	
			Cost for 120 cum = a+b+c+d+e+f				2300307.17	
			Rate per cum = (a+b+c+d+e+f)/120				19169.23	
							say	<u>19169.00</u>
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	10800.63	65883.84	M-081
			Coarse sand	cum	6.75	4289.86	28956.54	M-004
			20 mm Aggregate	cum	8.10	4006.27	32450.81	M-053
			10 mm Aggregate	cum	5.40	4006.27	21633.87	M-051
			b) Labour					

			Mate	day	0.90	365.00	328.50	L-12
			Mason	day	1.50	490.00	735.00	L-11
			Mazdoor	day	21.00	350.00	7350.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	270.00	1620.00	P&M-009
			Generator 33 KVA	hour	6.00	432.00	2592.00	P&M-079
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>		<b>161551.00</b>			
			<b>For formwork and staging add the following:</b>					
14.1C Case I	(i)		<b>For solid slab super-structure, 20-30 per cent of (a+b+c)</b>					
	(p)		<b>Height upto 5m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				161551.00	
			<b>d) Formwork and staging 20 per cent of (a+b+c)</b>				32310.20	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				38772.24	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				23263.34	
			Cost for 15 cum = a+b+c+d+e+f				255896.78	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				17059.79	
							<b>say</b>	<b><u>17060.00</u></b>
14.1C Case I (i)	(q)		<b>Height 5m to 10m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				161551.00	
			<b>d) Formwork and staging 25 per cent of (a+b+c)</b>				40387.75	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				40387.75	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				24232.65	
			Cost for 15 cum = a+b+c+d+e+f				266559.15	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				17770.61	
							<b>say</b>	<b><u>17771.00</u></b>
14.1C Case I (i)	(r)		<b>Height above 10m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				161551.00	
			<b>d) Formwork and staging 30 per cent of (a+b+c)</b>				48465.30	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				42003.26	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				25201.96	
			Cost for 15 cum = a+b+c+d+e+f				277221.52	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				18481.43	
							<b>say</b>	<b><u>18481.00</u></b>
14.1C Case I	(ii)		<b>For T-beam &amp; slab, 25-35 per cent of (a+b+c)</b>					
	(p)		<b>Height upto 5m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				161551.00	
			<b>d) Formwork and staging 25 per cent of (a+b+c)</b>				40387.75	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				40387.75	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				24232.65	
			Cost for 15 cum = a+b+c+d+e+f				266559.15	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				17770.61	
							<b>say</b>	<b><u>17771.00</u></b>
14.1C Case I (ii)	(q)		<b>Height 5m to 10m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				161551.00	
			<b>d) Formwork and staging 30 per cent of (a+b+c)</b>				48465.30	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				42003.26	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				25201.96	
			Cost for 15 cum = a+b+c+d+e+f				277221.52	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				18481.43	



			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1304278.00	
			d) Formwork and staging 30 per cent of (a+b+c)				391283.40	
			e) Overhead charges @ 20% on (a+b+c+d)				339112.28	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				203467.37	
			Cost for 120 cum = a+b+c+d+e+f				2238141.05	
			Rate per cum = (a+b+c+d+e+f)/120				18651.18	
							say	<u>18651.00</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				1304278.00	
			d) Formwork and staging 25 per cent of (a+b+c)				326069.50	
			e) Overhead charges @ 20% on (a+b+c+d)				326069.50	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				195641.70	
			Cost for 120 cum = a+b+c+d+e+f				2152058.70	
			Rate per cum = (a+b+c+d+e+f)/120				17933.82	
							say	<u>17934.00</u>
14.1C Case II (ii)	(q)		Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1304278.00	
			d) Formwork and staging 30 per cent of (a+b+c)				391283.40	
			e) Overhead charges @ 20% on (a+b+c+d)				339112.28	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				203467.37	
			Cost for 120 cum = a+b+c+d+e+f				2238141.05	
			Rate per cum = (a+b+c+d+e+f)/120				18651.18	
							say	<u>18651.00</u>
14.1C Case II (ii)	(r)		Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1304278.00	
			d) Formwork and staging 35 per cent of (a+b+c)				456497.30	
			e) Overhead charges @ 20% on (a+b+c+d)				352155.06	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				211293.04	
			Cost for 120 cum = a+b+c+d+e+f				2324223.40	
			Rate per cum = (a+b+c+d+e+f)/120				19368.53	
							say	<u>19369.00</u>
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	10800.63	68367.99	M-081
			Coarse sand	cum	6.75	4289.86	28956.54	M-004
			20 mm Aggregate	cum	8.10	4006.27	32450.81	M-053
			10 mm Aggregate	cum	5.40	4006.27	21633.87	M-051
			b) Labour					
			Mate	day	0.90	365.00	328.50	L-12
			Mason	day	1.50	490.00	735.00	L-11
			Mazdoor	day	21.00	350.00	7350.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	270.00	1620.00	P&M-009
			Generator 33 KVA	hour	6.00	432.00	2592.00	P&M-079
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>		<b>164035.00</b>			
			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)	<b>Height upto 5m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				164035.00	
		<b>d) Formwork and staging 18 per cent of (a+b+c)</b>				29526.30	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				38712.26	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				23227.36	
		Cost for 15 cum = a+b+c+d+e+f				255500.92	
		<b>Rate per cum = (a+b+c+d+e+f)/15</b>				17033.39	
						<b>say</b>	<b><u>17033.00</u></b>
14.1D Case I (i)	(q)	<b>Height 5m to 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				164035.00	
		<b>d) Formwork and staging 23 per cent of (a+b+c)</b>				37728.05	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				40352.61	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				24211.57	
		Cost for 15 cum = a+b+c+d+e+f				266327.23	
		<b>Rate per cum = (a+b+c+d+e+f)/15</b>				17755.15	
						<b>say</b>	<b><u>17755.00</u></b>
14.1D Case I (i)	(r)	<b>Height above 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				164035.00	
		<b>d) Formwork and staging 28 per cent of (a+b+c)</b>				45929.80	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				41992.96	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				25195.78	
		Cost for 15 cum = a+b+c+d+e+f				277153.54	
		<b>Rate per cum = (a+b+c+d+e+f)/15</b>				18476.90	
						<b>say</b>	<b><u>18477.00</u></b>
14.1D Case I	(ii)	<b>For T-beam &amp; slab, 23-33 per cent of (a+b+c)</b>					
	(p)	<b>Height upto 5m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				164035.00	
		<b>d) Formwork and staging 23 per cent of (a+b+c)</b>				37728.05	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				40352.61	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				24211.57	
		Cost for 15 cum = a+b+c+d+e+f				266327.23	
		<b>Rate per cum = (a+b+c+d+e+f)/15</b>				17755.15	
						<b>say</b>	<b><u>17755.00</u></b>
14.1D Case I (ii)	(q)	<b>Height 5m to 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				164035.00	
		<b>d) Formwork and staging 28 per cent of (a+b+c)</b>				45929.80	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				41992.96	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				25195.78	
		Cost for 15 cum = a+b+c+d+e+f				277153.54	
		<b>Rate per cum = (a+b+c+d+e+f)/15</b>				18476.90	
						<b>say</b>	<b><u>18477.00</u></b>
14.1D Case I (ii)	(r)	<b>Height above 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				164035.00	
		<b>d) Formwork and staging 33 per cent of (a+b+c)</b>				54131.55	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				43633.31	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				26179.99	
		Cost for 15 cum = a+b+c+d+e+f				287979.85	
		<b>Rate per cum = (a+b+c+d+e+f)/15</b>				19198.66	

								say	<u>19199.00</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							164035.00	
		d) Formwork and staging 38 per cent of (a+b+c)							62333.30	
		e) Overhead charges @ 20% on (a+b+c+d)							45273.66	
		f) Contractor's profit @ 10% on (a+b+c+d+e)							27164.20	
		Cost for 15 cum = a+b+c+d+e+f							298806.16	
		Rate per cum = (a+b+c+d+e+f)/15							19920.41	
								say	<u>19920.00</u>	
14.1D Case I (iii)	(q)	Height 5m to 10m								
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum							164035.00	
		d) Formwork and staging 48 per cent of (a+b+c)							78736.80	
		e) Overhead charges @ 20% on (a+b+c+d)							48554.36	
		f) Contractor's profit @ 10% on (a+b+c+d+e)							29132.62	
		Cost for 15 cum = a+b+c+d+e+f							320458.78	
		Rate per cum = (a+b+c+d+e+f)/15							21363.92	
								say	<u>21364.00</u>	
14.1D Case I (iii)	(r)	Height above 10m								
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum							164035.00	
		d) Formwork and staging 58 per cent of (a+b+c)							95140.30	
		e) Overhead charges @ 20% on (a+b+c+d)							51835.06	
		f) Contractor's profit @ 10% on (a+b+c+d+e)							31101.04	
		Cost for 15 cum = a+b+c+d+e+f							342111.40	
		Rate per cum = (a+b+c+d+e+f)/15							22807.43	
								say	<u>22807.00</u>	
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump							
			<b>Unit = cum</b>							
			<b>Taking output = 120 cum</b>							
			<b>a) Material</b>							
			Cement	tonne	50.64	10800.63	546943.90			M-081
			Coarse sand	cum	54.00	4289.86	231652.29			M-004
			20 mm Aggregate	cum	64.80	4006.27	259606.45			M-053
			10 mm Aggregate	cum	43.20	4006.27	173070.96			M-051
			<b>b) Labour</b>							
			Mate	day	0.88	365.00	321.20			L-12
			Mason	day	3.00	490.00	1470.00			L-11
			Mazdoor	day	19.00	350.00	6650.00			L-13
			<b>c) Machinery</b>							
			Batching Plant @ 20 cum/hour	hour	6.00	2592.00	15552.00			P&M-002
			Generator 100 KVA	hour	6.00	810.00	4860.00			P&M-079
			Loader	hour	6.00	936.00	5616.00			P&M-017
			Transit Mixer ( capacity 4.0 cu.m )							
			Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1080.00	16200.00			P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.44	57960.00			Lead =30 km & P&M-050
			Concrete Pump	hour	6.00	297.00	1782.00			P&M-007
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>			<b>1321685.00</b>				
			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)	<b>Height upto 5m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1321685.00	
		<b>d) Formwork and staging 18 per cent of (a+b+c)</b>				237903.30	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				311917.66	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				187150.60	
		Cost for 120 cum = a+b+c+d+e+f				2058656.56	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				17155.47	
						<b>say</b>	<b><u>17155.00</u></b>
14.1D Case II (i)	(q)	<b>Height 5m to 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1321685.00	
		<b>d) Formwork and staging 23 per cent of (a+b+c)</b>				303987.55	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				325134.51	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				195080.71	
		Cost for 120 cum = a+b+c+d+e+f				2145887.77	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				17882.40	
						<b>say</b>	<b><u>17882.00</u></b>
14.1D Case II (i)	(r)	<b>Height above 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1321685.00	
		<b>d) Formwork and staging 28 per cent of (a+b+c)</b>				370071.80	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				338351.36	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				203010.82	
		Cost for 120 cum = a+b+c+d+e+f				2233118.98	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				18609.32	
						<b>say</b>	<b><u>18609.00</u></b>
14.1D Case II	(ii)	<b>For T-beam &amp; slab, 23-33 per cent of (a+b+c)</b>					
	(p)	<b>Height upto 5m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1321685.00	
		<b>d) Formwork and staging 23 per cent of (a+b+c)</b>				303987.55	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				325134.51	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				195080.71	
		Cost for 120 cum = a+b+c+d+e+f				2145887.77	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				17882.40	
						<b>say</b>	<b><u>17882.00</u></b>
14.1D Case II (ii)	(q)	<b>Height 5m to 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1321685.00	
		<b>d) Formwork and staging 28 per cent of (a+b+c)</b>				370071.80	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				338351.36	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				203010.82	
		Cost for 120 cum = a+b+c+d+e+f				2233118.98	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				18609.32	
						<b>say</b>	<b><u>18609.00</u></b>
14.1D Case II (ii)	(r)	<b>Height above 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1321685.00	
		<b>d) Formwork and staging 33 per cent of (a+b+c)</b>				436156.05	
		<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				351568.21	
		<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				210940.93	
		Cost for 120 cum = a+b+c+d+e+f				2320350.19	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				19336.25	



			Cost for 15 cum = a+b+c+d+e+f				269319.60	
			Rate per cum = (a+b+c+d+e+f)/15				17954.64	
						say	<u>17955.00</u>	
14.1E Case I (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				170025.00	
			d) Formwork and staging 25 per cent of (a+b+c)				42506.25	
			e) Overhead charges @ 20% on (a+b+c+d)				42506.25	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				25503.75	
			Cost for 15 cum = a+b+c+d+e+f				280541.25	
			Rate per cum = (a+b+c+d+e+f)/15				18702.75	
						say	<u>18703.00</u>	
14.1E Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				170025.00	
			d) Formwork and staging 30 per cent of (a+b+c)				51007.50	
			e) Overhead charges @ 20% on (a+b+c+d)				44206.50	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				26523.90	
			Cost for 15 cum = a+b+c+d+e+f				291762.90	
			Rate per cum = (a+b+c+d+e+f)/15				19450.86	
						say	<u>19451.00</u>	
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				170025.00	
			d) Formwork and staging 25 per cent of (a+b+c)				42506.25	
			e) Overhead charges @ 20% on (a+b+c+d)				42506.25	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				25503.75	
			Cost for 15 cum = a+b+c+d+e+f				280541.25	
			Rate per cum = (a+b+c+d+e+f)/15				18702.75	
						say	<u>18703.00</u>	
14.1E Case I (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				170025.00	
			d) Formwork and staging 30 per cent of (a+b+c)				51007.50	
			e) Overhead charges @ 20% on (a+b+c+d)				44206.50	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				26523.90	
			Cost for 15 cum = a+b+c+d+e+f				291762.90	
			Rate per cum = (a+b+c+d+e+f)/15				19450.86	
						say	<u>19451.00</u>	
14.1E Case I (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				170025.00	
			d) Formwork and staging 35 per cent of (a+b+c)				59508.75	
			e) Overhead charges @ 20% on (a+b+c+d)				45906.75	
			f) Contractor's profit @ 10% on (a+b+c+d+e)				27544.05	
			Cost for 15 cum = a+b+c+d+e+f				302984.55	
			Rate per cum = (a+b+c+d+e+f)/15				20198.97	
						say	<u>20199.00</u>	
14.1E		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
			a) Material					

			Cement	tonne	51.60	10800.63	557312.51	M-081
			Coarse sand	cum	54.00	4289.86	231652.29	M-004
			20 mm Aggregate	cum	64.80	4006.27	259606.45	M-053
			10 mm Aggregate	cum	43.20	4006.27	173070.96	M-051
			Admixture @ 0.4 per cent of cement	kg	206.40	158.02	32615.33	M-180
			<b>b) Labour</b>					
			Mate	day	0.94	365.00	343.10	L-12
			Mason	day	3.50	490.00	1715.00	L-11
			Mazdoor	day	20.00	350.00	7000.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2592.00	15552.00	P&M-002
			Generator 100 KVA	hour	6.00	810.00	4860.00	P&M-080
			Loader	hour	6.00	936.00	5616.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1080.00	16200.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.44	57960.00	Lead =30 km & P&M-050
			Concrete Pump	hour	6.00	297.00	1782.00	P&M-007
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>1365286.00</b>			
			<b>For formwork and staging add the following:</b>					
14.1E Case II	(i)		<b>For solid/voided slab super-structure, 18-28 per cent of (a+b+c)</b>					
	(p)		<b>Height upto 5m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1365286.00	
			<b>d) Formwork and staging 18 per cent of (a+b+c)</b>				245751.48	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				322207.50	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				193324.50	
			Cost for 15 cum = a+b+c+d+e+f				2126569.47	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				17721.41	
							<b>say 17721.00</b>	
14.1E Case II (i)	(q)		<b>Height 5m to 10m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1365286.00	
			<b>d) Formwork and staging 23 per cent of (a+b+c)</b>				314015.78	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				335860.36	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				201516.21	
			Cost for 120 cum = a+b+c+d+e+f				2216678.35	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				18472.32	
							<b>say 18472.00</b>	
14.1E Case II (i)	(r)		<b>Height above 10m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1365286.00	
			<b>d) Formwork and staging 28 per cent of (a+b+c)</b>				382280.08	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				349513.22	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				209707.93	
			Cost for 120 cum = a+b+c+d+e+f				2306787.23	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				19223.23	
							<b>say 19223.00</b>	
14.1E Case II	(ii)		<b>For T-beam &amp; slab including launching of precast girders by launching truss upto 40 m, 23-33 per cent of cost of concrete (a+b+c)</b>					
	(p)		<b>Height upto 5m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1365286.00	
			<b>d) Formwork and staging 23 per cent of (a+b+c)</b>				314015.78	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				335860.36	

			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>			201516.21	
			Cost for 120 cum = a+b+c+d+e+f			2216678.35	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>			18472.32	
						<b>say</b>	<b><u>18472.00</u></b>
14.1E Case II (ii)	(q)		<b>Height 5m to 10m</b>				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1365286.00	
			<b>d) Formwork and staging 28 per cent of (a+b+c)</b>			382280.08	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>			349513.22	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>			209707.93	
			Cost for 120 cum = a+b+c+d+e+f			2306787.23	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>			19223.23	
						<b>say</b>	<b><u>19223.00</u></b>
14.1E Case II (ii)	(r)		<b>Height above 10m</b>				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1365286.00	
			<b>d) Formwork and staging 33 per cent of (a+b+c)</b>			450544.38	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>			363166.08	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>			217899.65	
			Cost for 120 cum = a+b+c+d+e+f			2396896.10	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>			19974.13	
						<b>say</b>	<b><u>19974.00</u></b>
14.1E Case II	(iii)		<b>For cast-in-situ box girder, segment construction and balanced cantilever, 38-58 per cent of cost of concrete.</b>				
	(p)		<b>Height upto 5m</b>				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1365286.00	
			<b>d) Formwork and staging 38 per cent of (a+b+c)</b>			518808.68	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>			376818.94	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>			226091.36	
			Cost for 120 cum = a+b+c+d+e+f			2487004.98	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>			20725.04	
						<b>say</b>	<b><u>20725.00</u></b>
14.1E Case II (iii)	(q)		<b>Height 5m to 10m</b>				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1365286.00	
			<b>d) Formwork and staging 48 per cent of (a+b+c)</b>			655337.28	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>			404124.66	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>			242474.79	
			Cost for 120 cum = a+b+c+d+e+f			2667222.73	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>			22226.86	
						<b>say</b>	<b><u>22227.00</u></b>
14.1E Case II (iii)	(r)		<b>Height above 10m</b>				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1365286.00	
			<b>d) Formwork and staging 58 per cent of (a+b+c)</b>			791865.88	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>			431430.38	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>			258858.23	
			Cost for 120 cum = a+b+c+d+e+f			2847440.48	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>			23728.67	
						<b>say</b>	<b><u>23729.00</u></b>
14.1F	F		<b>PSC Grade M-45</b>				
			<b>Unit = 1 cum</b>				
			<b>Taking output = 120 cum</b>				

			<b>a) Material</b>					
			Cement	tonne	55.80	10800.63	602675.15	M-081
			Coarse sand	cum	54.00	4289.86	231652.29	M-004
			20 mm Aggregate	cum	64.80	4006.27	259606.45	M-053
			10 mm Aggregate	cum	43.20	4006.27	173070.96	M-051
			Admixture @ 0.4 per cent of cement	kg	223.20	158.02	35270.06	M-180
			<b>b) Labour</b>					
			Mate	day	0.94	365.00	343.10	L-12
			Mason	day	3.50	490.00	1715.00	L-11
			Mazdoor	day	20.00	350.00	7000.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2592.00	15552.00	P&M-002
			Generator 100 KVA	hour	6.00	810.00	4860.00	P&M-080
			Loader	hour	6.00	936.00	5616.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1080.00	16200.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.44	57960.00	Lead =30 km & P&M-050
			Concrete Pump	hour	6.00	297.00	1782.00	P&M-007
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>1413304.00</b>			
			<b>For formwork and staging add the following:</b>					
14.1F	(i)		<b>For solid slab/voided slab super-structure, 16-26 per cent of cost of concrete (a+b+c)</b>					
	(p)		<b>Height upto 5m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1413304.00	
			<b>d) Formwork and staging 16 per cent of (a+b+c)</b>				226128.64	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				327886.53	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				196731.92	
			Cost for 120 cum = a+b+c+d+e+f				2164051.08	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				18033.76	
							<b>say 18034.00</b>	
14.1F (i)	(q)		<b>Height 5m to 10m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1413304.00	
			<b>d) Formwork and staging 21 per cent of (a+b+c)</b>				296793.84	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				342019.57	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				205211.74	
			Cost for 120 cum = a+b+c+d+e+f				2257329.15	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				18811.08	
							<b>say 18811.00</b>	
14.1F (i)	(r)		<b>Height above 10m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1413304.00	
			<b>d) Formwork and staging 26 per cent of (a+b+c)</b>				367459.04	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				356152.61	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>				213691.56	
			Cost for 120 cum = a+b+c+d+e+f				2350607.21	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				19588.39	
							<b>say 19588.00</b>	
14.1F	(ii)		<b>For T-beam &amp; slab including launching of precast girders by launching truss upto 40 m span, 21-31 per cent of cost of concrete.</b>					
	(p)		<b>Height upto 5m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				1413304.00	
			<b>d) Formwork and staging 21 per cent of (a+b+c)</b>				296793.84	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>				342019.57	

			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>			205211.74	
			Cost for 120 cum = a+b+c+d+e+f			2257329.15	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>			18811.08	
						<b>say</b>	<b><u>18811.00</u></b>
14.1F (ii)		(q)	<b>Height 5m to 10m</b>				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1413304.00	
			<b>d) Formwork and staging 26 per cent of (a+b+c)</b>			367459.04	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>			356152.61	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>			213691.56	
			Cost for 120 cum = a+b+c+d+e+f			2350607.21	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>			19588.39	
						<b>say</b>	<b><u>19588.00</u></b>
14.1F (ii)		(r)	<b>Height above 10m</b>				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1413304.00	
			<b>d) Formwork and staging 31 per cent of (a+b+c)</b>			438124.24	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>			370285.65	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>			222171.39	
			Cost for 120 cum = a+b+c+d+e+f			2443885.28	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>			20365.71	
						<b>say</b>	<b><u>20366.00</u></b>
14.1F		(iii)	<b>For cast-in-situ box girder, segmental construction and balanced cantilever, 36-56 per cent of cost of concrete.</b>				
		(p)	<b>Height upto 5m</b>				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1413304.00	
			<b>d) Formwork and staging 36 per cent of (a+b+c)</b>			508789.44	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>			384418.69	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>			230651.21	
			Cost for 120 cum = a+b+c+d+e+f			2537163.34	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>			21143.03	
						<b>say</b>	<b><u>21143.00</u></b>
14.1F (iii)		(q)	<b>Height 5m to 10m</b>				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1413304.00	
			<b>d) Formwork and staging 46 per cent of (a+b+c)</b>			650119.84	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>			412684.77	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>			247610.86	
			Cost for 120 cum = a+b+c+d+e+f			2723719.47	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>			22697.66	
						<b>say</b>	<b><u>22698.00</u></b>
14.1F (iii)		(r)	<b>Height above 10m</b>				
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum			1413304.00	
			<b>d) Formwork and staging 56 per cent of (a+b+c)</b>			791450.24	
			<b>e) Overhead charges @ 20% on (a+b+c+d)</b>			440950.85	
			<b>f) Contractor's profit @ 10% on (a+b+c+d+e)</b>			264570.51	
			Cost for 120 cum = a+b+c+d+e+f			2910275.60	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>			24252.30	
						<b>say</b>	<b><u>24252.00</u></b>
14.2	1600		<b>Supplying, fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications</b>				
			<b>Unit = 1 MT</b>				
			<b>Taking output = 1 MT</b>				
			<b>a) Material</b>				

			HYSD bars including 5 per cent for laps and wastage	tonne	1.05	48832.85	51274.49	M-082
			Binding wire	Kg	8.00	58.24	465.93	M-072
			<b>b) Labour for cutting, bending, tying and placing in position</b>					
			Mate	day	0.44	365.00	160.60	L-12
			Blacksmith	day	3.00	490.00	1470.00	L-02
			Mazdoor	day	8.00	350.00	2800.00	L-13
			<b>Basic Cost of Labour &amp; Material (a+b)</b>		<b>56172.00</b>			
			<b>c) Overhead charges @ 20% on (a+b)</b>				11234.20	
			<b>d) Contractor's profit @ 10% on (a+b+c)</b>				6740.52	
			<b>Rate per MT = a+b+c+d</b>				74145.74	
						<b>say</b>	<b>74146.00</b>	
14.4	2702		Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications					
			<b>Unit = 1 cum</b>					
			<b>Taking output = 1 cum</b>					
			<b>a) Material</b>					
			Cement concrete M30 Grade Refer relevant item of concrete in Item 14.1 excluding formwork	cum	1.00	10869.00	10869.00	Item 14.1(C)
			HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.075	56170.00	4212.75	Item 14.2 A
			<b>b) Labour</b>					
			Mazdoor for cleaning deck slab concrete surface.	day	0.15	350.00	52.50	L-13
			<b>c) Overhead charges @ 20% on (a+b)</b>				3026.85	
			<b>d) Contractor's profit @ 10% on (a+b+c)</b>				1816.11	
			<b>Rate per cum (a+b+c+d)</b>				19977.21	
						<b>say</b>	<b>19977.00</b>	
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 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.					
			<b>Unit = sqm</b>					
			<b>Taking output = 72.46 sqm (2 tonnes)(0.869 cum) assuming a density of 2.3 tonnes/cum.</b>					
			<b>a) Labour</b>					
			Mate	day	0.49	365.00	178.85	L-12
			Mazdoor	day	11.00	350.00	3850.00	L-13
			Mazdoor (Skilled)	day	1.25	490.00	612.50	L-15
			<b>b) Machinery</b>					
			Mechanical broom @ 1250 sqm per hour	hour	0.06	414.00	24.84	P&M-031
			Air compressor 250 cfm	hour	0.06	370.80	22.25	P&M-001
			Mastic cooker 1 tonne capacity	hour	6.00	72.00	432.00	P&M-030
			Bitumen boiler 1500 litres capacity	hour	6.00	230.40	1382.40	P&M-005
			Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.00	421.20	421.20	P&M-053
			<b>c) Material</b>					
			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 @ 10.2 per cent by weight of mix. $2 \times 10.2/100 = 0.204$	tonne	0.204	28965.49	5908.96	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	1762.64	687.43	M-021
			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	7834.00	2820.24	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	4006.27	2203.45	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	640.25	23.05	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	28.97	30.41	M-074/1000
			<b>d) Overhead charges @ 20% on (a+b+c)</b>				3719.52	
			<b>e) Contractor's profit @ 10% on (a+b+c+d)</b>				2231.71	
			Cost for 72.46 sqm = a+b+c+d+e				24548.81	
			<b>Rate per sqm = (a+b+c+d+e)/72.46</b>				338.79	
						<b>say</b>	<b><u>339.00</u></b>	
		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		<b>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.</b>					
			<b>Unit = 1 RM</b>					
			<b>Taking output = 2 x 24 m span = 48 m</b>					
			<b>a) Material</b>					
			i) M30 Grade Reinforced Cement Concrete	cum	4.092	10869.00	44475.95	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.				2223.80	
			ii) HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.87	56170.00	48587.05	Item 14.2 A
			Refer MoRTH SD / 202.					
			Add 5 per cent of (a) for handling and fixing of precast panels in position				4764.34	
			<b>b) Overhead charges @ 20% on (a)</b>				20010.23	
			<b>c) Contractor's profit @ 10% on (a+b)</b>				12006.14	
			<b>Rate for 48 m (a+b+c)</b>				132067.50	
			<b>Rate per metre (a+b+c)/48</b>				2751.41	



			Skilled (Blacksmith, welder etc.)	day	0.02	490.00	9.80	L-02
			Mazdoor	day	0.02	350.00	7.00	L-13
			<b>For fixing in position</b>					
			Mate	day	0.01	365.00	3.65	L-12
			Mason	day	0.01	490.00	4.90	L-11
			Mazdoor	day	0.20	350.00	70.00	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.				36.06	
			c) Overhead charges @ 20% on (a+b)				151.45	
			d) Contractor's profit @ 10% on (a+b+c)				90.87	
			Rate per metre (a+b+c+d)				999.56	
						say	<u>1000.00</u>	
		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.					
14.11	1500,1600,1700 & 2704		<b>Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification</b>					
			<b>Unit = 1 cum</b>					
			<b>Taking output = 1 cum</b>					
			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	10846.00	10846.00	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.				216.92	
			HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.05	56170.00	2808.50	Item 14.2 A
			b) Overhead charges @ 20% on (a)				2774.28	
			c) Contractor's profit @ 10% on (a+b)				1664.57	
			Rate per cum (a+b+c)				18310.27	
						say	<u>18310.00</u>	
		Note	The grade of reinforced cement concrete may be adopted as M30 for severe conditions and M25 for moderate conditions.					
14.16	800		<b>Painting on concrete surface</b>					
			<b>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.</b>					
			<b>Unit = sqm</b>					
			<b>Taking output = 10 sqm</b>					
			a) Labour					
			Mate	day	0.01	365.00	3.65	L-12
			Painter	day	0.25	490.00	122.50	L-18
			Mazdoor (Skilled)	day	0.25	490.00	122.50	L-15
			b) Material					
			Water based paint of approved quality for cement concrete surface	Litres	5.00	35.00	175.00	M-190
			c) Overhead charges @ 20% on (a+b)				84.73	
			d) Contractor's profit @ 10% on (a+b+c)				50.84	
			Cost for 10 sqm (a+b+c+d)				559.22	
			Rate per sqm (a+b+c+d)/10				55.92	
						say	<u>56.00</u>	
14.22	2607		<b>Strip Seal Expansion Joint</b>					

		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.						
		<i>Unit = Running meter</i>						
		<i>Taking output = 12 m</i>						
		<b>a) Labour</b>						
		Mate	day	0.05	365.00	18.25		L-12
		Mazdoor	day	1.00	350.00	350.00		L-13
		Mazdoor (Skilled)	day	0.25	490.00	122.50		L-15
		<b>b) Material</b>						
		Supply of complete assembly of strip seal expansion joint comprising of edge beams, anchorage, strip seal element and complete accessories as per approved specifications and drawings.	metre	12.00	8407.70	100892.40		M-178
		Add 5 per cent of cost of material for anchorage reinforcement, welding and other incidentals.				5069.16		
		<b>c) Overhead charges @ 20% on (a+b)</b>				21290.46		
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				12774.28		
		Cost for 12 m = (a+b+c+d)				140517.05		
		<b>Rate per m = (a+b+c+d)/12</b>				11709.75		
						<b>say</b>	<b><u>11710.00</u></b>	
	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.						



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.					
			<i>Unit = cum</i>					
			<i>Taking output = 1 cum</i>					
		a)	Material					
			Stone	cum	1.00	2106.00	2106.00	M-003
			Stone Spalls	cum	0.20	2106.00	421.20	M-001
		b)	Labour					
			Mate	day	0.04	365.00	14.60	L-12
			Mason	day	0.35	490.00	171.50	L-11
			Mazdoor *	day	0.75	350.00	262.50	L-13
		c)	Overhead charges @ 20% on (a+b)				595.16	
		d)	Contractor's profit @ 10% on (a+b+c)				357.10	
			Rate per cum = (a+b+c+d)				3928.06	
							<b>say 3928.00</b>	
		*	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		<b>Boulder Apron Laid in Wire Crates</b> 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.					
			<i>Unit = cum</i>					
			<i>Taking output = 3 mx1.5mx1.25m = 5.63 cum</i>					
		a)	Material					
			4mm GI wire crates woven in mesh size of 100 mm x 100 mm.	sqm	22.00	98.69	2171.18	M-102
			Stone	cum	5.63	2106.00	11856.78	M-003
			Stone Spalls	cum	1.13	2106.00	2379.78	M-001
		b)	Labour					
			Mate	day	0.18	365.00	65.70	L-12
			Mazdoor (Skilled)	day	1.50	490.00	735.00	L-15
			Mazdoor	day	*3.00	350.00	1050.00	L-13
		c)	Overhead charges @ 20% on (a+b)				3651.7	
		d)	Contractor's profit @ 10% on (a+b+c)				2191.01	
			Cost for 5.63 cum = a+b+c+d				24101.14	
			Rate per cum = (a+b+c+d)/5.63				4280.84	
							<b>say 4281.00</b>	
		*	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.					
15.4	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					
			<i>Unit = cum</i>					
			<i>Taking output = 1 cum</i>					
		a)	Material					
			Stone weighing not less than 40kg	cum	1.00	2106.00	2106.00	M-003
			Stone spalls of minimum 25 mm size	cum	0.20	2106.00	421.20	M-001
		b)	Labour					
			Mate	day	0.04	365.00	14.60	L-12
			Mason	day	0.35	490.00	171.50	L-11
			Mazdoor	day	0.75	350.00	262.50	L-13
		c)	Overhead charges @ 20% on (a+b)				595.16	
		d)	Contractor's profit @ 10% on (a+b+c)				357.10	
			Rate per cum = (a+b+c+d)				3928.06	
							<b>say 3928.00</b>	
15.4		B	Cement Concrete Blocks of size 0.3x0.3 x0.3 m cast in cement concrete of Grade M15					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		Concrete Grade M15 Rate as per item No. 12.8 (A)	cum	1.00	13016.00	13016.00	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.				260.32	
		<b>Rate per cum</b>				13276.32	
					<b>say</b>	<b>13276.00</b>	
15.5	2504	Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Material</b>					
		Graded stone aggregate of required size	cum	1.20	1469.60	1763.52	M-012
		<b>b) Labour</b>					
		Mate	day	0.05	365.00	18.25	L-12
		Mazdoor (Skilled)	day	0.25	490.00	122.50	L-15
		Mazdoor *	day	1.00	350.00	350.00	L-13
		<b>c) Overhead charges @ 20% on (a+b)</b>				450.85	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				270.51	
		<b>Rate per cum = (a+b+c+d)</b>				2975.64	
					<b>say</b>	<b>2976.00</b>	
		Includes Mazdoor required for trimming of slope to proper profile and preparation of bed.					
15.8	2505	Providing and laying Flooring complete as per drawing and Technical specifications laid over cement concert bedding.					
		<b>A Rubble stone laid in cement mortar 1:3</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Cement mortar 1:3 (Rate as in Item 12.6 sub-analysis) excluding OH &amp; CP</b>	cum	0.33	10342.00	3412.86	Item 12.6 (A)
		<b>b) Add for cement concrete bedding (M15 Nominal mix) vide Item 12.8 (A) excluding OH &amp; CP . Quantity shall be adopted as per design ( Assume Rubble stone Flooring thickness 300mm and cement concrete bedding thickness 100mm)</b>	cum	0.33	9482.00	3129.06	Item 12.8 (A)
		Add 1 per cent of cost to account for excavation for preparation of bed.				65.42	
		<b>c) Material</b>					
		Stone	cum	1.00	2106.00	2106.00	M-003
		Stone Spalls	cum	0.20	2106.00	421.20	M-001
		<b>d) Labour</b>					
		Mate	day	0.08	365.00	29.20	L-12
		Mason	day	0.50	490.00	245.00	L-11
		Mazdoor (for laying stones, filling of quarry spalls)	day	1.50	350.00	525.00	L-13
		<b>e) Overhead charges @ 20% on (a+c+d)</b>				1347.85	
		<b>f) Contractor's profit @ 10% on (a+c+d+e)</b>				808.71	
		<b>Rate per cum = (a+b+c+d+e+f)</b>				12090.30	
					<b>say</b>	<b>12090.00</b>	
		* Includes cement mortar for laying and filling of joints.					
15.8		<b>B Cement Concrete blocks Grade M15</b>					
		Concrete Grade M15 block. (Rate as per item No. 12.8 (A) including OH & CP.	cum	1.00	13016.00	13016.00	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	13016.00	4295.28	Item 12.8 (A)
		Add 1 per cent of cost to account for excavation for preparation of bed.				173.11	
		<b>Rate per cum</b>				17484.39	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
					<i>say</i>	<u>17484.00</u>	
15.13	2503.3	<b>Gabian Structure for Erosion Control, River Training Works and Protection works</b>					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 2 x 1 x 0.3 x 10 Nos. = 6.00 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.14	365.00	51.10	L-12
		Mazdoor	day	2.50	350.00	875.00	L-13
		Mazdoor (Skilled)	day	1.00	490.00	490.00	L-15
		<b>b) Material</b>					
		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	98.69	6414.85	M-102
		Stone boulders with least dimension of 200 mm	cum	6.00	2106.00	12636.00	M-003
		Stone spalls of minimum size 25 mm	cum	1.20	2106.00	2527.20	M-001
		<b>c) Overhead charges @ 20% on (a+b)</b>				4598.83	
		<b>d) Contractor's profit @ 10% on (a+b+c)</b>				2759.30	
		Cost for 6.00 cum (a+b+c+d)				30352.28	
		<b>Rate per cum (a+b+c+d)/6.00</b>				5058.71	
					<i>say</i>	<u>5059.00</u>	
		<b>Note</b> 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.					

AGGREGATES FROM			
SI	Aggregate Size	Unit	Rate
1	Boulder	Cum	700
2	90mm	Cum	900
3	75mm	Cum	900
4	63mm	Cum	900
5	53mm	Cum	900
6	40mm	Cum	900
7	25mm	Cum	1000
8	20mm	Cum	1000
9	13.2mm	Cum	1000
10	10mm	Cum	1000
11	6mm	Cum	1200
12	5.6mm	Cum	1200
13	4.75mm & below	Cum	1300
14	Stone Dust	Cum	1400
15	Gravel	Cum	79
16	Coarse sand	Cum	1200
	Medium sand	Cum	1200
	Fine sand	Cum	1200