

**PUBLIC WORKS DEPARTMENT  
ARUNACHAL PRADESH**



2012

**ANALYSIS OF RATES**

**FOR  
ROAD AND BRIDGE WORKS**

**ZERO LEAD BASED:  
(EXCLUDING CARRIAGE COST)**

PUBLISHED UNDER THE AUTHORITY OF  
THE CHIEF ENGINEER (DESIGN & PLANNING) P.W.D,  
ARUNACHAL PRADESH  
**ITANAGAR**

## FOREWORD

The schedule of Rates for Roads and Bridges works under PWD, Arunachal Pradesh, was last revised in 2010. As per Guidelines in the works manual, in every two years the Schedule of Rates has to be revised for updating current market rates to avoid cost overrun. Hence the latest Arunachal Pradesh Works Department Schedule of Rates (Roads and Bridges) 2012 is now being brought out purely for evaluating cost of the projects by detailed estimation.

Basic structure and methodology has been followed for analysis of items as per the **Standard Data Book of the Ministry of Road Transport and Highways, Govt of India, New Delhi**. The related computer programme of ministry has been deployed for undertaking the analysis. Therefore the execution of items of works in the scheduled at site shall be done in concurrence with the **MoRTH specification for Road and Bridge works**.

The basic rates adopted in this schedule for cement, reinforcing bars, structural steel and bitumen are based on the market rates prevailing at Guwahati. The rates for sand, aggregates and other forest products are based on the prevailing average rates at quarry or source of collection and inclusive of State and Central taxes, any local monopoly charge etc. but exclusive of VAT.

It is highly emphasised that while adopting the SOR, the user may acquaint themselves with the preambles attached before every chapters. The rates for completed items at the site of works shall be inclusive of basic rates of materials plus the actual carriage of the materials from source/approved quarry to the site of works. The carriage of each category of materials can be worked out with the carriage chart attached with this SOR prepared for both for Plain and Hill road parameters based on status of road in hilly Himalaya region of Arunachal Pradesh.

Although, all care has been taken to update the schedule in the best possible manner, there may be still undetected error and scope for its further improvement. All Superintending Engineers, Executive Engineers, Assistant Engineer under PWD and other works department may, therefore feel free to point out any error, or give their valuable suggestions for further improvement and feedback on reasonability of rates while preparing estimates.

I would like to record my sincere appreciation of the efforts of Er,Hage Pilliya, SSW(D&P) and his team of dedicated officers especially Er. Gobo Yirang, SW(D&P), Er.S.Syed Ummer, JE(D&P) and other staff in bringing out this Schedule of Rate 2012 with a teamwork spirit.

It is brought to notice of all field engineers that, we are in continuous process of updating the schedule for release of APSR 2014. Therefore a realistic feedback of rate of actual procurement from sources may sent to this office for incorporating a realistic basic rates of materials in next schedule.

Finally, I take pleasure in releasing the **Arunachal Pradesh Public Works Department Schedule of Rates (Roads and Bridges) 2012** for its official use.



( **Atop Lego** )  
Chief Engineer (SID&P)  
PWD, Itanagar, AP.

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**LEAD CHART FOR CARRIAGE OF MATERIALS TO VARIOUS DESTINATIONS  
IN ARUNACHAL PRADESH FROM GUWAHATI**

**UNDER WESTERN ZONE**

**CAPITAL CIRCLE**

1. Guwahati to CD'A",Itanagar = 410 Km.
2. Guwahati to Naharlagun = 400 Km.
3. Guwahati to Doimukh = 397 Km.
4. Guwahati to CD'B',Itanagar = 410 Km.

**BOBIA CIRCLE**

1. Guwahati to Seppa = 410 Km.
2. Guwahati to Bameng = 462 Km.
3. Guwahati to Sagalee = 468 Km.

**RUPA CIRCLE**

1. Guwahati to Bomdila = 364 Km.
2. Guwahati to Tawang = 545 Km.
3. Guwahati to Jung = 505 Km.
4. Guwahati to Kalaktang = 398 Km
5. Guwahati to Dirang = 406 Km
6. Guwahati to Lumla = 585 Km

**UNDER CENTRAL ZONE 'A'**

**BASAR CIRCLE**

1. Guwahati to Basar = 621 Km.
2. Guwahati to Dumporijo = 736 Km.
3. Guwahati to Daporijo = 745 Km.
4. Guwahati to Gensi = 561 Km.
5. Guwahati to Nacho = 860 Km.

**YACHULI CIRCLE**

1. Guwahati to Ziro = 531 Km.
2. Guwahati to Sangram = 616 Km.
3. Guwahati to Tali = 676 Km.
4. Guwahati to Yazali = 496 Km.

## **UNDER CENTRAL ZONE 'B'**

### **BOLENG CIRCLE**

1. Guwahati to Pasighat = 620 Km.
2. Guwahati to Boleng = 710 Km.
3. Guwahati to Yingkiong = 785 Km.
4. Guwahati to Mariyang = 837 Km.
5. Guwahati to Nari = 565 Km

### **ALONG CIRCLE**

1. Guwahati to Along = 671 Km.
2. Guwahati to Yomcha = 758 Km.
3. Guwahati to Rungong = 701 Km.
4. Guwahati to Mechuka = 921 Km.

## **UNDER EASTERN ZONE**

### **JAIRAMPUR CIRCLE**

1. Guwahati to Jairampur = 587 Km.
2. Guwahati to Changlang = 589 Km.
3. Guwahati to Khonsa = 633 Km.
4. Guwahati to Longding = 685 Km.
5. Guwahati to Kanubari = 645 Km.

### **TEZU CIRCLE**

1. Guwahati to Namsai = 545 Km.
2. Guwahati to Tezu = 602 Km.
3. Guwahati to Roing via Makum = 587 Km.
4. Guwahati to Hayuliang = 702 Km.
5. Guwahati to Anini = 821 Km.

**CARRIAGE OF MATERIALS BY MECHANICAL TRANSPORT  
(INCLUDING LOADING, UNLOADING AND STACKING)**

Lead in Km (L)	Average speed (S)	Number of trips (N) =8/(2L/S)+1	Number of KM done (2NL+6)	Diesel consumption (Litre)	Cost of Diesel @	Mobil oil consumption (Litre)	Cost of Mobil oil @	Cost of labour (male) 5 Nos. @	Hire Charges of truck per day	Total Cost (C6+C8 C9+C10)	Cost per trip (C11/C3)	Increase in cost per Km over previous Km	Avg. cost per addl.Km after 1st (5Km, 10Km, 20Km)
					Rs.46.52 per Litre		Rs.230.00 per Litre						
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	16.00	7.11	20.22	4.04	187.94	0.144	33.12	1250.00	3900.00	5371.06	755.31	-	
2	17.00	6.48	31.90	6.38	296.8	0.228	52.44	1250.00	3900.00	5499.24	849.15	93.84	
3	17.50	5.96	41.74	8.35	388.44	0.298	68.54	1250.00	3900.00	5606.98	941.17	92.02	
4	18.00	5.54	50.31	10.06	467.99	0.359	82.57	1250.00	3900.00	5700.56	1029.27	88.10	
5	18.50	5.19	57.93	11.59	539.17	0.414	95.22	1250.00	3900.00	5784.39	1113.89	84.62	
6	19.00	4.90	64.84	12.97	603.36	0.463	106.49	1250.00	3900.00	5859.85	1195.10	81.21	
7	19.50	4.66	71.19	14.24	662.44	0.509	117.07	1250.00	3900.00	5929.51	1273.32	78.22	
8	20.00	4.44	77.11	15.42	717.34	0.551	126.73	1250.00	3900.00	5994.07	1348.67	75.35	75.58
9	20.50	4.26	82.68	16.54	769.44	0.591	135.93	1250.00	3900.00	6055.37	1421.54	72.87	
10	21.00	4.10	87.95	17.59	818.29	0.628	144.44	1250.00	3900.00	6112.73	1491.80	70.26	
11	21.50	3.95	92.99	18.60	865.27	0.664	152.72	1250.00	3900.00	6167.99	1559.93	68.13	
12	22.00	3.83	97.83	19.57	910.4	0.699	160.77	1250.00	3900.00	6221.17	1625.99	66.06	
13	22.50	3.71	102.49	20.50	953.66	0.732	168.36	1250.00	3900.00	6272.02	1689.96	63.97	
14	23.00	3.61	107.02	21.40	995.53	0.764	175.72	1250.00	3900.00	6321.25	1752.09	62.13	
15	23.50	3.51	111.42	22.28	1036.47	0.796	183.08	1250.00	3900.00	6369.55	1812.61	60.52	
16	24.00	3.43	115.71	23.14	1076.47	0.827	190.21	1250.00	3900.00	6416.68	1871.53	58.92	60.10
17	24.50	3.35	119.91	23.98	1115.55	0.857	197.11	1250.00	3900.00	6462.66	1928.91	57.38	
18	25.00	3.28	124.03	24.81	1154.16	0.886	203.78	1250.00	3900.00	6507.94	1984.92	56.01	
19	25.50	3.21	128.08	25.62	1191.84	0.915	210.45	1250.00	3900.00	6552.29	2039.56	54.64	
20	26.00	3.15	132.06	26.41	1228.59	0.943	216.89	1250.00	3900.00	6595.48	2092.80	53.24	
21	26.50	3.09	135.99	27.20	1265.34	0.971	223.33	1250.00	3900.00	6638.67	2145.04	52.24	
22	27.00	3.04	139.86	27.97	1301.16	0.999	229.77	1250.00	3900.00	6680.93	2196.05	51.01	
23	27.50	2.99	143.69	28.74	1336.98	1.026	235.98	1250.00	3900.00	6722.96	2246.08	50.03	
24	28.00	2.95	147.47	29.49	1371.87	1.053	242.19	1250.00	3900.00	6764.06	2294.95	48.87	
25	28.50	2.90	151.22	30.24	1406.76	1.080	248.4	1250.00	3900.00	6805.16	2343.00	48.05	47.78
26	29.00	2.86	154.94	30.99	1441.65	1.107	254.61	1250.00	3900.00	6846.26	2390.29	47.29	
27	29.50	2.83	158.62	31.72	1475.61	1.133	260.59	1250.00	3900.00	6886.20	2436.43	46.14	
28	30.00	2.79	162.28	32.46	1510.04	1.159	266.57	1250.00	3900.00	6926.61	2482.04	45.61	
29	30.50	2.76	165.91	33.18	1543.53	1.185	272.55	1250.00	3900.00	6966.08	2526.63	44.59	
30	31.00	2.73	169.52	33.90	1577.03	1.211	278.53	1250.00	3900.00	7005.56	2570.59	43.96	

**CARRIAGE OF MATERIALS BY MECHANICAL TRANSPORT  
(INCLUDING LOADING, UNLOADING AND STACKING)**

Sl. No.	Material	Capacity (Net)	Unit of Rate	1 Km	2 Km	3 Km	4 Km	5 Km	Beyond 5 Km upto 10 Km addl. per Km	Beyond 10 Km upto 20 Km addl. per Km	Beyond 20 Km upto 30 Km addl. per Km	Beyond 30 Km addl. per Km
	<b>Cost per trip</b>			<b>755.31</b>	<b>849.15</b>	<b>941.17</b>	<b>1029.27</b>	<b>1113.89</b>	<b>75.58</b>	<b>60.10</b>	<b>47.78</b>	<b>47.78</b>
1.	Sand, Lime, Shingle, Aggreagte, Surkhi, Earth, Moorum, Excavated rock and Kerb stone	3.50	Cu.m.	215.8	242.61	268.91	294.08	318.25	21.59	17.17	13.65	13.65
	Add CPOH @ 10%			21.58	24.26	26.89	29.41	31.83	2.16	1.72	1.37	1.37
	<b>Total</b>			<b>237.38</b>	<b>266.87</b>	<b>295.8</b>	<b>323.49</b>	<b>350.08</b>	<b>23.75</b>	<b>18.89</b>	<b>15.02</b>	<b>15.02</b>
2.	Timber, Bamboo and Ballie	4	Cu.m.	188.83	212.29	235.29	257.32	278.47	18.9	15.03	11.94	11.94
	Add CPOH @ 10%			18.88	21.23	23.53	25.73	27.85	1.89	1.5	1.19	1.19
	<b>Total</b>			<b>207.71</b>	<b>233.52</b>	<b>258.82</b>	<b>283.05</b>	<b>306.32</b>	<b>20.79</b>	<b>16.53</b>	<b>13.13</b>	<b>13.13</b>
3.	Cement, Steel, Angle and Tee Channel	7	Ton	107.9	121.31	134.45	147.04	159.13	10.8	8.59	6.83	6.83
	Add CPOH @ 10%			10.79	12.13	13.45	14.7	15.91	1.08	0.86	0.68	0.68
	<b>Total</b>			<b>118.69</b>	<b>133.44</b>	<b>147.9</b>	<b>161.74</b>	<b>175.04</b>	<b>11.88</b>	<b>9.45</b>	<b>7.51</b>	<b>7.51</b>
4.	Bricks	1500	1000	503.54	566.1	627.45	686.18	742.59	50.39	40.07	31.85	31.85
	Add CPOH @ 10%			50.35	56.61	62.75	68.62	74.26	5.04	4.01	3.19	3.19
	<b>Total</b>			<b>553.89</b>	<b>622.71</b>	<b>690.2</b>	<b>754.80</b>	<b>816.85</b>	<b>55.43</b>	<b>44.08</b>	<b>35.04</b>	<b>35.04</b>
5.	Tar, Bitumen and Firewood	5	Ton	151.06	169.83	188.23	205.85	222.78	15.12	12.02	9.56	9.56
	Add CPOH @ 10%			15.11	16.98	18.82	20.59	22.28	1.51	1.2	0.96	0.96
	<b>Total</b>			<b>166.17</b>	<b>186.81</b>	<b>207.05</b>	<b>226.44</b>	<b>245.06</b>	<b>16.63</b>	<b>13.22</b>	<b>10.52</b>	<b>10.52</b>
6.	Stone for masonry & soling	3.50	Cu.m.	215.80	242.61	268.91	294.08	318.25	21.59	17.17	13.65	13.65
	Add CPOH @ 10%			21.58	24.26	26.89	29.41	31.83	2.16	1.72	1.37	1.37
	<b>Total</b>			<b>237.38</b>	<b>266.87</b>	<b>295.8</b>	<b>323.49</b>	<b>350.08</b>	<b>23.75</b>	<b>18.89</b>	<b>15.02</b>	<b>15.02</b>
7.	SW Pipe											
	a) 100 mm dia.	480	100 m	157.36	176.91	196.08	214.43	232.06	15.75	12.52	9.95	9.95
	Add CPOH @ 10%			15.74	17.69	19.61	21.44	23.21	1.58	1.25	1	1
	<b>Total</b>			<b>173.1</b>	<b>194.6</b>	<b>215.69</b>	<b>235.87</b>	<b>255.27</b>	<b>17.33</b>	<b>13.77</b>	<b>10.95</b>	<b>10.95</b>
	b) 150 mm dia.	240	100 m	314.71	353.81	392.15	428.86	464.12	31.49	25.04	19.91	19.91
	Add CPOH @ 10%			31.47	35.38	39.22	42.89	46.41	3.15	2.5	1.99	1.99
	<b>Total</b>			<b>346.18</b>	<b>389.19</b>	<b>431.37</b>	<b>471.75</b>	<b>510.53</b>	<b>34.64</b>	<b>27.54</b>	<b>21.9</b>	<b>21.9</b>

**CARRIAGE OF MATERIALS BY MECHANICAL TRANSPORT  
(INCLUDING LOADING, UNLOADING AND STACKING)**

Sl. No.	Material	Capacity (Net)	Unit of Rate	1 Km	2 Km	3 Km	4 Km	5 Km	Beyond 5 Km upto 10 Km addl. per Km	Beyond 10 Km upto 20 Km addl. per Km	Beyond 20 Km upto 30 Km addl. per Km	Beyond 30 Km addl. per Km
	<b>Cost per trip</b>			<b>755.31</b>	<b>849.15</b>	<b>941.17</b>	<b>1029.27</b>	<b>1113.89</b>	<b>75.58</b>	<b>60.10</b>	<b>47.78</b>	<b>47.78</b>
c)	200 mm dia.	135	100 m	559.49	629	697.16	762.42	825.1	55.99	44.52	35.39	35.39
	Add CPOH @ 10%			55.95	62.9	69.72	76.24	82.51	5.6	4.45	3.54	3.54
	<b>Total</b>			<b>615.44</b>	<b>691.90</b>	<b>766.88</b>	<b>838.66</b>	<b>907.61</b>	<b>61.59</b>	<b>48.97</b>	<b>38.93</b>	<b>38.93</b>
d)	230 mm dia.	105	100 m	719.34	808.71	896.35	980.26	1060.85	71.98	57.24	45.5	45.5
	Add CPOH @ 10%			71.93	80.87	89.64	98.03	106.09	7.2	5.72	4.55	4.55
	<b>Total</b>			<b>791.27</b>	<b>889.58</b>	<b>985.99</b>	<b>1078.29</b>	<b>1166.94</b>	<b>79.18</b>	<b>62.96</b>	<b>50.05</b>	<b>50.05</b>
e)	250 mm dia.	84	100 m	899.18	1010.89	1120.44	1225.32	1326.06	89.98	71.55	56.88	56.88
	Add CPOH @ 10%			89.92	101.09	112.04	122.53	132.61	9	7.16	5.69	5.69
	<b>Total</b>			<b>989.1</b>	<b>1111.98</b>	<b>1232.48</b>	<b>1347.85</b>	<b>1458.67</b>	<b>98.98</b>	<b>78.71</b>	<b>62.57</b>	<b>62.57</b>
f)	300 mm dia.	66	100 m	1144.41	1286.59	1426.02	1559.5	1687.71	114.52	91.06	72.39	72.39
	Add CPOH @ 10%			114.44	128.66	142.6	155.95	168.77	11.45	9.11	7.24	7.24
	<b>Total</b>			<b>1258.85</b>	<b>1415.25</b>	<b>1568.62</b>	<b>1715.45</b>	<b>1856.48</b>	<b>125.97</b>	<b>100.17</b>	<b>79.63</b>	<b>79.63</b>
g)	350 mm dia.	48	100 m	1573.56	1769.06	1960.77	2144.31	2320.6	157.46	125.21	99.54	99.54
	Add CPOH @ 10%			157.36	176.91	196.08	214.43	232.06	15.75	12.52	9.95	9.95
	<b>Total</b>			<b>1730.92</b>	<b>1945.97</b>	<b>2156.85</b>	<b>2358.74</b>	<b>2552.66</b>	<b>173.21</b>	<b>137.73</b>	<b>109.49</b>	<b>109.49</b>
h)	400 mm dia.	33	100 m	2288.82	2573.18	2852.03	3119	3375.42	229.04	182.12	144.78	144.78
	Add CPOH @ 10%			228.88	257.32	285.2	311.9	337.54	22.90	18.21	14.48	14.48
	<b>Total</b>			<b>2517.70</b>	<b>2830.5</b>	<b>3137.23</b>	<b>3430.9</b>	<b>3712.96</b>	<b>251.94</b>	<b>200.33</b>	<b>159.26</b>	<b>159.26</b>
i)	450 mm dia.	27	100 m	2797.44	3145.00	3485.81	3812.11	4125.52	279.93	222.59	176.96	176.96
	Add CPOH @ 10%			279.74	314.5	348.58	381.21	412.55	27.99	22.26	17.70	17.70
	<b>Total</b>			<b>3077.18</b>	<b>3459.5</b>	<b>3834.39</b>	<b>4193.32</b>	<b>4538.07</b>	<b>307.92</b>	<b>244.85</b>	<b>194.66</b>	<b>194.66</b>
j)	500 mm dia.	24	100 m	3147.13	3538.13	3921.54	4288.63	4641.21	314.93	250.42	199.08	199.08
	Add CPOH @ 10%			314.71	353.81	392.15	428.86	464.12	31.49	25.04	19.91	19.91
	<b>Total</b>			<b>3461.84</b>	<b>3891.94</b>	<b>4313.69</b>	<b>4717.49</b>	<b>5105.33</b>	<b>346.42</b>	<b>275.46</b>	<b>218.99</b>	<b>218.99</b>
k)	600 mm dia.	18	100 m	4196.17	4717.50	5228.72	5718.17	6188.28	419.9	333.89	265.44	265.44
	Add CPOH @ 10%			419.62	471.75	522.87	571.82	618.83	41.99	33.39	26.54	26.54
	<b>Total</b>			<b>4615.79</b>	<b>5189.25</b>	<b>5751.59</b>	<b>6289.99</b>	<b>6807.11</b>	<b>461.89</b>	<b>367.28</b>	<b>291.98</b>	<b>291.98</b>
8. RC Pipes, AC Pipes, Hume, Steel and CI Pipe												
a)	100 mm dia.	292.80	100 m	257.96	290.01	321.44	351.53	380.43	25.81	20.53	16.32	16.32
	Add CPOH @ 10%			25.8	29	32.14	35.15	38.04	2.58	2.05	1.63	1.63
	<b>Total</b>			<b>283.76</b>	<b>319.01</b>	<b>353.58</b>	<b>386.68</b>	<b>418.47</b>	<b>28.39</b>	<b>22.58</b>	<b>17.95</b>	<b>17.95</b>
b)	125 mm dia.	219.60	100 m	343.95	386.68	428.58	468.7	507.24	34.42	27.37	21.76	21.76
	Add CPOH @ 10%			34.4	38.67	42.86	46.87	50.72	3.44	2.74	2.18	2.18
	<b>Total</b>			<b>378.35</b>	<b>425.35</b>	<b>471.44</b>	<b>515.57</b>	<b>557.96</b>	<b>37.86</b>	<b>30.11</b>	<b>23.94</b>	<b>23.94</b>

**CARRIAGE OF MATERIALS BY MECHANICAL TRANSPORT  
(INCLUDING LOADING, UNLOADING AND STACKING)**

Sl. No.	Material	Capacity (Net)	Unit of Rate	1 Km	2 Km	3 Km	4 Km	5 Km	Beyond 5 Km upto 10 Km addl. per Km	Beyond 10 Km upto 20 Km addl. per Km	Beyond 20 Km upto 30 Km addl. per Km	Beyond 30 Km addl. per Km
	<b>Cost per trip</b>			<b>755.31</b>	<b>849.15</b>	<b>941.17</b>	<b>1029.27</b>	<b>1113.89</b>	<b>75.58</b>	<b>60.10</b>	<b>47.78</b>	<b>47.78</b>
	c) 150 mm dia. Add CPOH @ 10% <b>Total</b>	183	100 m	412.74 41.27 <b>454.01</b>	464.02 46.4 <b>510.42</b>	514.30 51.43 <b>565.73</b>	562.44 56.24 <b>618.68</b>	608.68 60.87 <b>669.55</b>	41.3 4.13 <b>45.43</b>	32.84 3.28 <b>36.12</b>	26.11 2.61 <b>28.72</b>	26.11 2.61 <b>28.72</b>
	d) 200 mm dia. Add CPOH @ 10% <b>Total</b>	109.80	100 m	687.9 68.79 <b>756.69</b>	773.36 77.34 <b>850.7</b>	857.17 85.72 <b>942.89</b>	937.40 93.74 <b>1031.14</b>	1014.47 101.45 <b>1115.92</b>	68.84 6.88 <b>75.72</b>	54.74 5.47 <b>60.21</b>	43.51 4.35 <b>47.86</b>	43.51 4.35 <b>47.86</b>
	e) 250 mm dia. Add CPOH @ 10% <b>Total</b>	80.52	100 m	938.04 93.8 <b>1031.84</b>	1054.58 105.46 <b>1160.04</b>	1168.86 116.89 <b>1285.75</b>	1278.28 127.83 <b>1406.11</b>	1383.37 138.34 <b>1521.71</b>	93.87 9.39 <b>103.26</b>	74.64 7.46 <b>82.10</b>	59.34 5.93 <b>65.27</b>	59.34 5.93 <b>65.27</b>
	f) 300 mm dia. Add CPOH @ 10% <b>Total</b>	62.22	100 m	1213.93 121.39 <b>1335.32</b>	1364.75 136.48 <b>1501.23</b>	1512.65 151.27 <b>1663.92</b>	1654.24 165.42 <b>1819.66</b>	1790.24 179.02 <b>1969.26</b>	121.48 12.15 <b>133.63</b>	96.59 9.66 <b>106.25</b>	76.79 7.68 <b>84.47</b>	76.79 7.68 <b>84.47</b>
	g) 350 mm dia. Add CPOH @ 10% <b>Total</b>	43.92	100 m	1719.74 171.97 <b>1891.71</b>	1933.4 193.34 <b>2126.74</b>	2142.92 214.29 <b>2357.21</b>	2343.51 234.35 <b>2577.86</b>	2536.18 253.62 <b>2789.8</b>	172.09 17.21 <b>189.3</b>	136.84 13.68 <b>150.52</b>	108.79 10.88 <b>119.67</b>	108.79 10.88 <b>119.67</b>
	h) 400 mm dia. Add CPOH @ 10% <b>Total</b>	32.94	100 m	2292.99 229.3 <b>2522.29</b>	2577.87 257.79 <b>2835.66</b>	2857.23 285.72 <b>3142.95</b>	3124.68 312.47 <b>3437.15</b>	3381.57 338.16 <b>3719.73</b>	229.45 22.95 <b>252.4</b>	182.45 18.25 <b>200.7</b>	145.05 14.51 <b>159.56</b>	145.05 14.51 <b>159.56</b>
	i) 450 mm dia. Add CPOH @ 10% <b>Total</b>	25.62	100 m	2948.13 294.81 <b>3242.94</b>	3314.4 331.44 <b>3645.84</b>	3673.58 367.360 <b>4040.94</b>	4017.45 401.75 <b>4419.2</b>	4347.74 434.77 <b>4782.51</b>	295.01 29.5 <b>324.51</b>	234.58 23.46 <b>258.04</b>	186.49 18.65 <b>205.14</b>	186.49 18.65 <b>205.14</b>
	j) 600, 700, 750, 800, 18.30 900, 1200 mm dia. Add CPOH @ 10% <b>Total</b>		100 m	4127.38 412.74 <b>4540.12</b>	4640.16 464.02 <b>5104.18</b>	5143.01 514.30 <b>5657.31</b>	5624.43 562.44 <b>6186.87</b>	6086.83 608.68 <b>6695.51</b>	413.02 41.3 <b>454.32</b>	328.42 32.84 <b>361.26</b>	261.09 26.11 <b>287.2</b>	261.09 26.11 <b>287.2</b>

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

Sl. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate
P&M-001	Air Compressor	General Purpose	capacity in cfm	170/250	hour	516
P&M-002	Batching and Mixing Plant (a) 30 cum capacity	Concrete Mixing	cum/hour	20	hour	2440
P&M-003	Batching and Mixing Plant (b) 15 - 20 cum capacity	Concrete Mixing	cum/hour	13	hour	2033
P&M-004	Bitumen Pressure Distributor	Applying bitumen tack coat	sqm/hour	1750	hour	1174
P&M-005	Bitumen Boiler oil fired	Bitumen Spraying	capacity in litre	1500	hour	217
P&M-006	Concrete Paver Finisher with 40 HP Motor	Paving of concrete surface	cum / hour	20	hour	2923
P&M-007	Concrete Pump of 45 & 30 cum capacity	Pumping of concrete	cum / hour	33 / 22	hour	279
P&M-008	Concrete Bucket	For Pouring concrete	capacity in cum	1	hour	17
P&M-009	Concrete Mixer (a) 0.4/0.28 cum	Concrete Mixing	cum/hour	2.5	hour	242
P&M-010	Concrete Mixer (b) 1 cum	Concrete Mixing	cum/hour	7.5	hour	242
P&M-011	Crane (a) 80 tonnes	Lifting Purpose			hour	1398
P&M-012	Cranes b) 35 tonnes	Lifting Purpose			hour	932
P&M-013	Cranes c) 3 tonnes	Lifting Purpose			hour	389
P&M-014	Dozer D - 80 - A 12	Spreading /Cutting / Clearing	cum/hour	300/ 150/250	hour	3615
P&M-015	Dozer D - 50 - A 15	Spreading /Cutting / Clearing	cum/hour	200/ 120/150	hour	2632
P&M-016	Emulsion Pressure Distributor	Applying emulsion tack coat	sqm/hour	1750	hour	873
P&M-017	Front End loader 1 cum bucket capacity	Soil loading / Aggregate loading	cum/hour	60 /25	hour	1253
P&M-018	Generator (a) 125 KVA	Generation of electric Energy	KVA	100	hour	787
P&M-019	Generator( b) 63 KVA	Generation of electric Energy	KVA	50	hour	545
P&M-020	GSB Plant 50 cum	Producing GSB	cum/hour	40	hour	1135
P&M-021	Hotmix Plant - 120 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	40	hour	25579
P&M-022	Hotmix Plant - 100 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	30	hour	18917
P&M-023	Hotmix Plant - 60 to 90 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	25	hour	15127
P&M-024	Hotmix Plant - 40 to 60 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	17	hour	12112
P&M-025	Hydraulic Chip Spreader	Surface Dressing	sqm/hour	1500	hour	2880
P&M-026	Hydraulic Excavator of 1 cum bucket	Soil Ordinary/Soil Marshy / Soil Unsuitable	cum/hour	60 /60 /60	hour	1571
P&M-027	Integrated Stone Crusher 100THP	Crushing of Spalls	TPH	100	hour	9470
P&M-028	Integrated Stone Crusher 200 HP	Crushing of Spalls	TPH	200	hour	19921
P&M-029	Kerb Casting Machine	Kerb Making	Rm/hour	80	hour	339
P&M-030	Mastic Cooker	Mastic Wearing coat	capacity in tonne	1	hour	68
P&M-031	Mechanical Broom Hydraulic	Surface Cleaning	sqm/hour	1250	hour	389
P&M-032	Motor Grader 3.35 mtr blade	Clearing /Spreading /GSB /WBM	cum/hour	200/200/50/50	hour	2617
P&M-033	Mobile slurry seal equipment	Mixing and laying slurry seal	sqm/hour	2700	hour	1101

P&M-034	Paver Finisher Hydrostatic with sensor control 100 TPH	Paving of DBM/ BM/SDC/ Premix	cum/hour	40	hour	<b>2923</b>
P&M-035	Paver Finisher Mechanical 100 TPH	Paving of WMM /Paving of DLC	cum/hour	40/30	hour	<b>1065</b>
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	<b>5972</b>
P&M-037	Pneumatic Road Roller	Rolling of Asphalt Surface	cum/hour	25	hour	<b>1359</b>
P&M-038	Pneumatic Sinking Plant	Pneumatic Sinking of wells	cum/hour	1.5 to 2.00	hour	<b>4557</b>
P&M-039	Pot Hole Repair Machine	Repair of potholes	cum/hour	4	hour	<b>991</b>
P&M-040	Prestressing Jack with Pump & access	Stressing of steel wires/stands			hour	<b>141</b>
P&M-041	Ripper	Scarifying	cum/hour	60	hour	<b>31</b>
P&M-042	Rotavator	Scarifying	cum/hour	25	hour	<b>19</b>
P&M-043	Road marking machine	Road marking	Sqm/hour	100	hour	<b>101</b>
P&M-044	Smooth Wheeled Roller 8 tonne	Soil Compaction /BM Compaction	cum/hour	70/25	hour	<b>504</b>
P&M-045	Tandem Road Roller	Rolling of Aspalt Surface	cum/hour	30	hour	<b>1250</b>
P&M-046	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	km	<b>31</b>
P&M-047	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	tonne.km	<b>0</b>
P&M-048	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	hour	<b>609</b>
P&M-049	Transit Mixer 4.0/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	hour	<b>1016</b>
P&M-050	Transit Mixer 4/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	tonne.km	<b>0</b>
P&M-051	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	hour	<b>932</b>
P&M-052	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	tonne.km	<b>0</b>
P&M-053	Tractor	Pulling	capacity in HP	50	hour	<b>427</b>
P&M-054	Tractor with Rotevator	Rate of Tractor + Rotevator			hour	<b>366</b>
P&M-055	Tractor with Ripper	Rate of Tractor 6+ Ripper			hour	<b>377</b>
P&M-056	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	km	<b>24</b>
P&M-057	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	hour	<b>488</b>
P&M-058	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	tonne.km	<b>24</b>
P&M-059	Three wheel 80-100 kN Statis Roller	Earth or soil / GSB / WBM	cum/hour	100/60/60	hour	<b>658</b>
P&M-060	Water Tanker	Water Transport	capacity in KL	6	hour	<b>488</b>
P&M-061	Water Tanker	Water Transport	capacity in KL	6	km	<b>24</b>
P&M-062	Wet Mix Plant 60 TPH	Wet Mix	cum/hour	25	hour	<b>1317</b>
<b>SI. No.</b>	<b>Description of Machine</b>				<b>Unit</b>	<b>Rates</b>
P&M-063	Air compressor with pneumatic chisel attachment for cutting hard clay.				hour	<b>569</b>
P&M-064	Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour				hour	<b>18755</b>
P&M-065	Belt conveyor system				hour	<b>1815</b>
P&M-066	Boat to carry atleast 20 persons				hour	<b>1815</b>
P&M-067	Cement concrete batch mix plant @ 20 cum per hour (effective output)				hour	<b>3170</b>
P&M-068	Cement concrete batch mix plant @ 75 cum per hour				hour	<b>4235</b>
P&M-069	Cold milling machine @ 20 cum per hour				hour	<b>input</b>
P&M-070	Crane 5 tonne capacity				hour	<b>666</b>

P&M-071	Crane 10 tonne capacity	hour	<b>690</b>
P&M-072	Crane 15 tonne capacity	hour	<b>726</b>
P&M-073	Crane 20 tonne capacity	hour	<b>787</b>
P&M-074	Crane 40 T capacity	hour	<b>968</b>
P&M-075	Crane with grab 0.75 cum capacity	hour	<b>726</b>
P&M-076	Compressor with guniting equipment along with accessories	hour	<b>726</b>
P&M-077	Drum mix plant for cold mixes of appropriate capacity but not less than 75 tonnes/hour.	hour	<b>363</b>
P&M-078	Epoxy Injection gun	hour	<b>3025</b>
P&M-079	Generator 33 KVA	hour	<b>407</b>
P&M-080	Generator 100 KVA	hour	<b>762</b>
P&M-081	Generator 250 KVA	hour	<b>908</b>
P&M-082	Induction, deinduction and erection of plant and equipment including all components and accessories for pneumatic method of well sinking.	hour	<b>input</b>
P&M-083	Joint Cutting Machine with 2-3 blades (for rigid pavement)	hour	<b>97</b>
P&M-084	Jack for Lifting 40 tonne lifting capacity.	day	<b>input</b>
P&M-085	Piling rig Including double acting pile driving hammer (Hydraulic rig)	hrs	<b>5972</b>
P&M-086	Plate compactor	hour	<b>303</b>
P&M-087	Snow blower equipment 140 HP @ 600 cum per hour	hour	<b>input</b>
P&M-088	Texturing machine (for rigid pavement)	hour	<b>242</b>
P&M-089	Truck Trailor 30 tonne capacity	hour	<b>input</b>
P&M-090	Truck Trailor 30 tonne capacity	t.km	<b>input</b>
P&M-091	Tunnel Boring machine	hour	<b>input</b>
P&M-092	Vibrating Pile driving hammer complete with power unit and accessories.	hour	<b>input</b>
P&M-093	Wet Mix Plant 100 TPH	hour	<b>1815</b>
P&M-094	Wet Mix Plant 75 TPH		<b>1452</b>

<b>(B) Labour</b>			
<b>Sl. No.</b>	<b>Description of Labour</b>	<b>Unit</b>	<b>Rate</b>
L-01	Blacksmith (IInd class)	day	300
L-02	Blacksmith (1st class)/ Welder/ Plumber/ Electrician	day	400
L-03	Blaster (Stone cutter)	day	300
L-04	Carpenter I Class	day	400
L-05	Chiseller (Head Mazdoor)	day	300
L-06	Driller (Jumper)	day	300
L-07	Diver	day	700
L-08	Fitter	day	400
L-09	Mali	day	300
L-10	Mason (IInd class)	day	300
L-11	Mason (1st class)	day	400
L-12	Mate / Supervisor	day	300
L-13	Mazdoor	day	250
L-14	Mazdoor/Dresser (Semi Skilled)	day	300
L-15	Mazdoor/Dresser/Sinker (Skilled)	day	400
L-16	Medical Officer	day	1200
L-17	Operator(grouting)	day	400
L-18	Painter I class	day	400
L-19	Para medical personnel	day	700
<b>(C) Materials</b>			
<b>Sl. No.</b>	<b>Description</b>	<b>Unit</b>	<b>Rate</b>
M-001	Stone Boulder of size 150 mm and below at Cruser Plant	cum	518
M-002	Supply of quarried stone 150 - 200 mm size for Hand Broken at site	cum	490
M-003	Boulder with minimum size of 300 mm for Pitching at Site	cum	435
M-004	Coarse sand at Mixing Plant	cum	540
M-005	Coarse sand at Site	cum	540
M-006	Fine sand at Site	cum	540
M-007	Moorum at Site	cum	250
M-008	Gravel/Quarry spall at Site	Cum	400
M-009	Granular Material or hard murrum for GSB works at Site	Cum	390
M-010	Granular Material or hard murrum for GSB works at Mixing Plant	Cum	250
M-011	Fly ash conforming to IS: 3812 ( Part II & I) atHMP Plant / Batching Plant / Crushing Plant	Cum	input
M-012	Filter media/Filter Material as per Table 300-3 (MoRT&H Specification)	Cum	1150

	<b>Description</b>	<b>Unit</b>	<b>Rate at Plant (HMP/Batching)</b>	<b>Rate at Site</b>
M-013	Close graded Granular sub-base Material 53 mm to 9.5 mm	cum	800	800
M-014	Close graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	850	850
M-015	Close graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	650	650
M-016	Close graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	700	700
M-017	Close graded Granular sub-base Material 9.5 mm to 2.36 mm	cum	680	680
M-018	Close graded Granular sub-base Material 4.75mm to 2.36 mm	cum	600	600
M-019	Close graded Granular sub-base Material 4.75mm to 75 micron mm		580	580
M-020	Close graded Granular sub-base Material 2.36 mm	cum	540	540
M-021	Stone crusher dust finer than 3mm with not more than 10% passing 0.075 sieve.	cum	560	560
M-022	Coarse graded Granular sub-base Material 2.36 mm & below	cum	560	560
M-023	Coarse graded Granular sub-base Material 4.75mm to 75 micron mm		600	600
M-024	Coarse graded Granular sub-base Material 4.75 mm to 2.36 mm	cum	600	600
M-025	Coarse graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	650	650
M-026	Coarse graded Granular sub-base Material 26.5 mm to 4.75 mm	cum	700	700
M-027	Coarse graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	750	750
M-028	Coarse graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	800	800
M-029	Coarse graded Granular sub-base Material 53 mm to 26.5mm	cum	850	850
M-030	Aggregates below 5.6 mm	cum	1640	1640
M-031	Aggregates 22.4 mm to 2.36 mm	cum	875	875
M-032	Aggregates 22.4 mm to 5.6 mm	cum	1365	1365
M-033	Aggregates 45 mm to 2.8 mm	cum	640	640
M-034	Aggregates 45 mm to 22.4 mm	cum	850	850
M-035	Aggregates 53 mm to 2.8 mm	cum	700	700
M-036	Aggregates 53 mm to 22.4 mm	cum	826	826
M-037	Aggregates 63 mm to 2.8 mm	cum	675	675
M-038	Aggregates 63 mm to 45 mm	cum	804	804
M-039	Aggregates 90 mm to 45 mm	cum	782	782
M-040	Aggregates 10 mm to 5 mm	cum	1750	1750
M-041	Aggregates 11.2 mm to 0.09 mm	cum	950	950
M-042	Aggregates 13.2 mm to 0.09 mm	cum	815	815
M-043	Aggregates 13.2 mm to 5.6 mm	cum	1500	1500
M-044	Aggregates 13.2 mm to 10 mm	cum	1338	1338
M-045	Aggregates 20 mm to 10 mm	cum	1400	1400
M-046	Aggregates 25 mm to 10 mm	cum	1350	1350
M-047	Aggregates 19 mm to 6 mm	cum	1465	1465
M-048	Aggregates 37.5 mm to 19 mm	cum	950	950
M-049	Aggregates 37.5 mm to 25 mm	cum	850	850
M-050	Aggregates 6 mm nominal size	cum	1740	1740
M-051	Aggregates 10 mm nominal size	cum	1750	1750
M-052	Aggregates 13.2/12.5 mm nominal size	cum	1700	1700
M-053	Aggregates 20 mm nominal size	cum	1600	1600
M-054	Aggregates 25 mm nominal size	cum	1550	1550
M-055	Aggregates 40 mm nominal size	cum	1250	1250

SI. No.	Description	Unit	Rate
M-056	AC pipe 100 mm dia	metre	31
M-057	Acrylic polymer bonding coat	litre	121
M-058	Alluminium Paint	litre	303
M-059	Aluminium alloy plate 2mm Thick	sqm	input
M-060	Aluminium alloy/galvanised steel	tonne	53931
M-061	Aluminium sheeting fixed with encapsulated lens type reflective sheeting including 2% towards lettering, cost of angle iron, cost of drilling holes, nuts, bolts etc.and signs as applicable	sqm	145
M-062	Aluminium studs 100 x 100 mm fitted with lense reflectors	nos	484
M-063	Barbed wire	kg	90
M-064	Bearing (Cost of parts)	nos	input
M-065	Bearing (Cast steel rocker bearing assembly of 250 tonne )	nos	302500
M-066	Bearing (Elastomeric bearing assembly consisting of 7 internal layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanisation,)	nos	14520
M-067	Bearing (Forged steel roller bearing of 250 tonne	nos	266200
M-068	Bearing (Pot type bearing assembly consisting of a metal piston supported by a disc, PTFE pads providing sliding surfaces against stainless steel mating together with cast steel assemblies/fabricated structural steel assemblies duly painted with all components	nos	60500
M-069	Bearing (PTFE sliding plate bearing assembly of 80 tonnes )	nos	181500
M-070	Bearing (Supply of sliding plate bearing of 80 tonne)	nos	14520
M-071	Bentonite	kg	2.45
M-072	Binding wire	kg	80
M-073	Bitumen ( Cationic Emulsion )	tonne	39586
M-074	Bitumen (60-70 grade)	tonne	49642
M-075	Bitumen (80-100 grade )	tonne	48810
M-076	Bitumen (Cutback )	tonne	52367
M-077	Bitumen (emulsion)	tonne	39586
M-078	Bitumen (modified graded)	tonne	44379
M-079	Brick	each	9
M-080	C.I.shoes for the pile	kg	55
M-081	Cement	tonne	8120
M-082	Cold twisted bars (HYSD Bars)	tonne	53650
M-083	Coller for joints 300 mm dia	nos	126
M-084	Compressible Fibre Board(20mm thick)	sqm	682
M-085	Connectors/ Staples	each	55
M-086	Copper Plate(12m long x 250mmwide)	kg	660
M-087	Corrosion resistant Structural steel	tonne	61
M-088	Corrugated sheet, 3 mm thick, "Thrie" beam section railing	kg	60
M-089	Credit for excavated rock found suitable for use	cum	231
M-090	Curing compound	liter	49
M-091	Delineators from ISI certified firm as per the standard drawing given in IRC - 79	each	input
M-092	Earth Cost or compensation for earth taken from private land	cum	0
M-093	Elastomeric slab seal expansion joint assembly manufactured by using chloroprene, elastomer for elastomeric slab unit conforming to clause 915.1 of IRC: 83 (part II),	metre	9900
M-094	Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each	100 nos	990
M-095	Epoxy compound with accessories for preparing epoxy mortar	kg	220
M-096	Epoxy mortar	kg	input
M-097	Epoxy primer	kg	121
M-098	Epoxy resin-hardner mix for prime coat	kg	99
M-099	Flag of red color cloth 600 x 600 mm	each	60
M-100	Flowering Plants	each	13
M-101	Galvanised MS flat clamp	nos	33
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	170
M-103	Galvanised structural steel plate 200 mm wide, 6 mm thick, 24 m long	kg	198
M-104	Gelatin 80%	kg	148

M-105	Geo grids	sqm	input
M-106	Geomembrane	sqm	input
M-107	Geonets	sqm	input
M-108	Geotextile	sqm	27
M-109	Geotextile filter fabric	sqm	input
M-110	GI bolt 10 mm Dia	nos	38
M-111	Grouting pump with agitator	hour	165
M-112	Grass (Doob)	kg	13
M-113	Grass (Fine)	kg	13
M-114	HDPE pipes 75mm dia	metre	42
M-115	HDPE pipes 90mm dia	metre	input
M-116	Hedge plants	each	7.7
M-117	Helical pipes 600mm diameter	metre	1155
M-118	Hot applied thermoplastic compound	litre	179
M-119	HTS strand	tonne	63800
M-120	Joint Sealant Compound	kg	302
M-121	Jute netting, open weave, 2.5 cm square opening for seeding and Mulching	sqm	13
M-122	LDO for steam curing	litre	40
M-123	M.S. Clamps	nos	55
M-124	M.S. Clamps	kg	220
M-125	M.S.shoes @ 35 Kg per pile of 15 m	kg	50
M-126	Tor Steel bars	tonne	53650
M-127	Modular strip/box seal expansion joint including anchorage catering to a horizontal movement beyond 70 mm and upto 140mm assembly comprising of edge beams, central beam,2 modules chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative	metre	209000
M-128	Modular strip/box seal expansion joint catering to a horizontal movement beyond 140mm and upto 210mm box/box seal joint assembly containing 3 modules/cells and comprising of edge beams, two central beams, chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative	metre	231000
M-129	Nipples 12mm	nos	27
M-130	Nuts and bolts	kg	100
M-131	Paint	litre	198
M-132	Pavement Marking Paint	litre	176
M-133	Paving Fabric	sqm	input
M-134	Perforated geosynthetic pipe 150 mm dia	metre	input
M-135	Perforated pipe of cement concrete, internal dia 100 mm	metre	85
M-136	Pesticide	kg	308
M-137	Pipes 200 mm dia, 2.5 m long for drainage	metre	input
M-138	Plastic sheath, 1.25 mm thick for dowel bars	sqm	0.9
M-139	Plastic tubes 50 cm dia, 1.2 m high	nos	input
M-140	Polymer braids	metre	input
M-141	Pre moulded Joint filler,25 mm thick for expansion joint.	sqm	550
M-142	Pre-coated stone chips of 13.2 mm nominal size	cum	1045
M-143	Preformed continuous chloroprene elastomer or closed cell foam sealing element with high tear strength, vulcanised in a single operation for the full length of a joint to ensure water tightness.	metre	4400
M-144	Pre-moulded asphalt filler board	sqm	60
M-145	Pre-packed cement based polymer concrete of strength 45 Mpa at 28 days	kg	33
M-146	Primer	kg	170
M-147	Quick setting compound	kg	50
M-148	Random Rubble Stone	cum	517
M-149	RCC Pipe NP 2 heavy duty non presure pipe 1000 mm dia	metre	852
M-150	RCC Pipe NP 2 heavy duty non presure pipe 1200 mm dia	metre	1155
M-151	RCC Pipe NP 2 heavy duty non presure pipe 300 mm dia	metre	423
M-152	Reflectorising glass beads	kg	208

M-153	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Copper Strips)	metre	<b>input</b>
M-154	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Galvanised carbon steel strips)	metre	<b>input</b>
M-155	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Glass reinforced polymer/fibre reinforced polymer/polymeric strips)	metre	<b>input</b>
M-156	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Stainless steel strips)	metre	<b>input</b>
M-157	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. Aluminium strips)	metre	<b>input</b>
M-158	Rivets	each	<b>0.9</b>
M-159	Sand bags (Cost of sand and Empty cement bag)	nos	<b>8.8</b>
M-160	Sapling 2 m high 25 mm dia	each	<b>88</b>
M-161	Scrap tyres of size 900 x 20	nos	<b>121</b>
M-162	Seeds	kg	<b>302</b>
M-163	Selected earth	cum	<b>181</b>
M-164	Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	<b>27</b>
M-165	Sheathing duct	metre	<b>99</b>
M-166	Shrubs	each	<b>11</b>
M-167	Sludge / Farm yard manure @ 0.18 cum per 100 sqm at site of work for turfing	cum	<b>121</b>
M-168	Sodium vapour lamp	each	<b>1815</b>
M-169	Square Rubble Coursed Stone	cum	<b>517</b>
M-170	Steel circular hollow pole of standard specification for street lighting to mount light at 5 m height above deck level	each	<b>5500</b>
M-171	Steel circular hollow pole of standard specification for street lighting to mount light at 9 m height above road level	each	<b>9075</b>
M-172	Steel drum 300 mm dia 1.2 m high/empty bitumen drum	nos	<b>60</b>
M-173	Steel helmet and cushion block on top of pile head during driving.	kg	<b>181</b>
M-174	Steel pipe 25 mm external dia as per IS:1239	metre	<b>192</b>
M-175	Steel pipe 50 mm external dia as per IS:1239	metre	<b>385</b>
M-176	Steel wire rope 20 mm	kg	<b>245</b>
M-177	Steel wire rope 40 mm	kg	<b>221</b>
M-178	Strip seal expansion join	metre	<b>12100</b>
M-179	Structural Steel	tonne	<b>57210</b>
M-180	Super plastisizer admixture IS marked as per 9103-1999	kg	<b>55</b>
M-181	Synthetic Geogrids as per clause 3102.8 and approved design and specifications.	sqm	<b>input</b>
M-182	Through and bond stone	each	<b>13</b>
M-183	Tie rods 20mm diameter	nos	<b>247</b>
M-184	Tiles size 300 x 300 mm and 25 mm thick	each	<b>input</b>
M-185	Timber	cum	<b>15400</b>
M-186	Traffic cones with 150 mm reflective sleeve	nos	<b>1320</b>
M-187	Tube anchorage set complete with bearing plate, permanent wedges etc	nos	<b>4180</b>
M-188	Unstaked lime	tonne	<b>11550</b>
M-189	Water	KL	<b>60</b>
M-190	Water based cement paint	litre	<b>77</b>
M-191	Welded steel wire fabric	kg	<b>44</b>
M-192	Wire mesh 50mm x 50mm size of 3mm wire	kg	<b>145</b>
M-193	Wooden ballies 2" Dia for bracing	each	<b>38</b>
M-194	Wooden ballies 8" Dia and 9 m long	each	<b>495</b>
M-195	Wooden packing	cum	<b>3630</b>
M-196	Wooden staff for fastening of flag 25 mm dia, one m long	each	<b>60</b>



Item 12.11 (C) iv	PCC Grade M35 including OH & CP for Well Foundation (Bottom Plug) by Batching Plant	cum	<b>7,782.00</b>
Item 12.11 (C) iv	PCC Grade M35 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Mechninery by Batching Plant	cum	<b>5,632.00</b>
Item 12.11 (F) iv	PCC Grade M35 including OH & CP for Well Foundation (Well Cap) by Batching Plant	cum	<b>7,582.00</b>
Item No. 3.13	Excavation for Structures (Manual Means)	cum	<b>254.00</b>
Item No. 3.13	Excavation for Structures (Mechanical Meanse)	cum	<b>46.00</b>
Item 14.1(A)	RCC Grade M20 for super-structure including OH & CP by Batching Plant	cum	<b>7,792.00</b>
Item 14.1(B)	RCC Grade M20 for super-structure including OH & CP by Batching Plant	cum	<b>8,547.00</b>
Item 14.1(E)	RCC Grade M20 for super-structure including OH & CP by Batching Plant	cum	<b>9,098.85</b>
Item 14.1(C)	RCC Grade M30 for super-structure including formwork and excluding OH & CP by Batching Plant	cum	<b>6,548.00</b>
Item 14.1(C)	RCC Grade M30 for super-structure excluding formwork and excluding OH & CP by Batching Plant	cum	<b>5,457.00</b>
Item 14.2 A	Supplying ,fitting and placing HYSD bar reinforcement in super-structure excluding OH & CP	tonne	<b>60,305.00</b>
Item 13.6	Supplying, fitting and placing HYSD including OH & CP for sub-structure	tonne	<b>78,328.00</b>
Item 5.17	Fog Seal	sqm	<b>42.00</b>
Item 5.21 Case-I	Crack Prevention courses. Case-I Stress Absorbing Membrane (SAM) crack width less than 6 mm	sqm	<b>73.00</b>
Item 5.21 Case-II	Crack Prevention courses. Case-II Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm	sqm	<b>84.00</b>
Item 5.21 Case-IV	Crack Prevention courses. Case-III Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 %	sqm	<b>110.00</b>
Item 5.21 Case-IV	Crack Prevention courses. Case-IV Bitumen Impregnated Geotextile	sqm	<b>102.00</b>
Item 5.15 Case-I	Slurry Seal Case-I 5 mm thickness	sqm	<b>68.00</b>
Item 5.15 Case-II	Slurry Seal Case-II 3 mm thickness	sqm	<b>47.00</b>
Item 5.15 Case-III	Slurry Seal Case III 1.5 mm thickness	sqm	<b>29.00</b>
Item 5.9 Case-I	Surface Dressing Case-I 19 mm nominal chipping size	sqm	<b>108.00</b>
Item 5.9 Case-II	Surface Dressing Case-II 13 mm nominal size chipping	sqm	<b>87.00</b>

**DIRECTLY USED ITEMS**

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>					
		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	609.00	200.97	P&M-048
		Front end-loader 1 cum bucket capacity @ 25 cum/hour	hour	0.330	1253.00	413.49	P&M-017
		<b>b) Overheads @ 10 % on (a)</b>				61.45	
		<b>c) Contractors profit @ 10 % on (a+b)</b>				67.59	
		Cost for 5.5 cum = a+b+c				743.50	
		<b>Rate per cum = (a+b+c)/ 5.5</b>				135.18	
	<b>Note</b>	<b>Unloading will be by tipping.</b>			<b>say</b>	<b>135.00</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>					
1.4(I)	<b>Case I</b>	<b>Surfaced Road</b>					
		Speed with load : 25 km / hour.					
		Speed while Returning empty : 35 km / hour.					
		<b>a) Machinery.</b>					
		<b>i) Tipper 10 tonne capacity</b>					
		Time taken for onward haulage with load	hour	0.400	609.00	243.60	P&M-048
		Time taken for empty return trip.	hour	0.290	609.00	176.61	P&M-048
		<b>b) Overheads @ 10 % on (a)</b>				42.02	
		<b>c) Contractors profit @ 10 % on (a+b)</b>				46.22	
		cost for 100 t km = a+b+c				508.45	
		<b>Rate per t.km = (a+b+c)/100</b>				5.08	
					<b>say</b>	<b>5.10</b>	
1.4(II)	<b>Case II</b>	<b>Unsurfaced Gravelled Road</b>					
		Speed with load : 20 km / hour					
		Speed for empty return trip : 30 km / hour					
		<b>a)Machinery</b>					
		<b>Tipper 10 tonnes capacity</b>					
		Time taken for onward hanlage with load	hour	0.500	609.00	304.50	P&M-048
		Time taken for empty return trip	hour	0.330	609.00	200.97	P&M-048
		<b>b) Overheads @ 10 % on (a)</b>				50.55	
		<b>c) Contractors profit @ 10 % on (a+b)</b>				55.60	
		Cost for 100 t.km = a+b+c				611.62	
		<b>Rate per t.Km = (a+b+c)/100</b>				6.12	
					<b>say</b>	<b>6.10</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
1.4(III)	Case 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>l) Tipper 10 tonnes capacity</b>					
		Time taken for onward haulage	hour	1.000	609.00	609.00	P&M-048
		Time taken for empty return trip	hour	0.670	609.00	408.03	P&M-048
		<b>b) Overheads @ 10 % on (a)</b>				101.70	
		<b>c) Contractors profit @ 10 % on (a+b)</b>				111.87	
		Cost for 100 t.km = a+b+c				1230.61	
		<b>Rate per t.Km = (a+b+c)/100</b>				12.31	
					<b>say</b>	<b>12.30</b>	
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	300.00	18.00	L-12
		Mazdoor	day	1.500	250.00	375.00	L-13
		<b>b) Material</b>					
		Supply of quarried stone 150 - 200 mm size	cum	1.100	490.00	539.00	M-002
		<b>c) Overheads @ 10 % on (a+b)</b>				93.20	
		<b>d) Contractors profit @ 10 % on (a+b+c)</b>				102.52	
		<b>Rate per cum = a+b+c+d</b>				1127.72	
					<b>say</b>	<b>1128.00</b>	
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.					
		<b>Unit : cum</b>					
		<b>Taking Output = 600 cum at crusher location.</b>					
		<b>a) Labour</b>					
		Mate	day	0.760	300.00	228.00	L-12
		Mazdoor Skilled	day	2.000	300.00	600.00	L-14
		Mazdoor including breaking of any oversize boulder.	day	17.000	250.00	4250.00	L-13
		<b>b) Material</b>					
		Stone Boulder of size 150 mm and below	cum	800.000	518.00	414400.00	M-001
		<b>c) Machinery</b>					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	19921.00	119526.00	P&M-028
		Front end loader 1 cum bucket capacity	Hour	20.000	1253.00	25060.00	P&M-017
		Tipper 5.5 cum capacity	Hour	20.000	609.00	12180.00	P&M-048
		<b>d) Overheads @ 10 % on (a+b+c)</b>				57624.40	
		<b>e) Contractors profit @ 10 % on (a+b+c+d)</b>				63386.84	
		Cost for 600 cum = a+b+c+d+e				697255.24	
		<b>Rate per cum = (a+b+c+d+e)*0.95/600</b>				<b>1103.99</b>	
					<b>say</b>	<b>1104.00</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. 95% of above cost will be attributed to the production of 600 cum of stone chips of 13.2 mm size and balance 5% 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	300.00	228.00	L-12
		Mazdoor Skilled	day	2.000	300.00	600.00	L-14
		Mazdoor including breaking of any size boulder.	day	17.000	250.00	4250.00	L-13
		<b>b) Material</b>					
		Stone Boulder of size 150 mm and below	cum	800.000	518.00	414400.00	M-001
		<b>c) Machinery</b>					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	19921.00	119526.00	P&M-028
		Front end loader 1 cum bucket capacity	Hour	20.000	1253.00	25060.00	P&M-017
		Tipper 5.5 cum capacity	Hour	20.000	609.00	12180.00	P&M-048
		<b>d) Overheads @ 10 % on (a+b+c)</b>				57624.40	
		<b>e) Contractors profit @ 10 % on (a+b+c+d)</b>				63386.84	
		Cost for 670 cum = a+b+c+d+e				697255.24	
		<b>Rate per cum = (a+b+c+d+e)*0.90/670</b>				<b>936.61</b>	
					<b>say</b>	<b>937.00</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% of above cost will be attributed to the production of 670 cum of stone aggregates of 20mm size and balance 10% 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	300.00	228.00	L-12
		Mazdoor Skilled	day	2.000	300.00	600.00	L-14
		Mazdoor	day	17.000	250.00	4250.00	L-13
		<b>b) Material</b>					
		Stone Boulder of size 150 mm and below	cum	800.000	518.00	414400.00	M-001
		<b>c) Machinery</b>					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	19921.00	119526.00	P&M-028
		Front end loader 1 cum bucket capacity	Hour	20.000	1253.00	25060.00	P&M-017
		Tipper 5.5 cum capacity	Hour	20.000	609.00	12180.00	P&M-048
		<b>d) Overheads @ 10 % on (a+b+c)</b>				57624.40	
		<b>e) Contractors profit @ 10 % on (a+b+c+d)</b>				63386.84	
		Cost for 750 cum = (a+b+c+d+e)x0.85				592666.95	
		<b>Rate per cum = (a+b+c+d+e)x0.85/750</b>				<b>790.22</b>	
					<b>say</b>	<b>790.00</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% of above cost will be attributed to the production of 750 cum of stone aggregates of 40mm size and balance 15% 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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.9	510	<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>Unit = sqm</b>					
		<b>Taking output = 9000 sqm</b>					
		<b>Case -I:-19 mm nominal chipping size</b>					
		<b>a) Labour</b>					
		Mate	day	0.440	300.00	132.00	L-12
		Mazdoor	day	9.000	250.00	2250.00	L-13
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	389.00	2800.80	P&M-031
		Air compressor 250 cfm	hour	7.200	516.00	3715.20	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	2880.00	17280.00	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	609.00	3654.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Bitumen pressure distributor	hour	6.000	1174.00	7044.00	P&M-004
		Smooth wheeled roller 8-10 tonne weight	hour	6.000	504.00	3024.00	P&M-044
		<b>c) Material</b>					
		Bitumen@ 1.20 kg per sqm	tonne	10.800	49642.00	536133.60	M-074
		Crushed stone chipping, 19 mm nominal size @ 0.015 cum per sqm	cum	135.000	1600.00	216000.00	M-053
		<b>d) Overheads @ 10 % on (a+b+c)</b>				80035.16	
		<b>e) Contractors profit @ 10 % on (a+b+c+d)</b>				88038.68	
		Cost for 9000 sqm= a+b+c+d+e				968425.44	
		<b>Rate per sqm = (a+b+c+d+e)/9000</b>				107.60	
					<b>say</b>	<b>108.00</b>	
		<b>Case - II13 mm nominal size chipping</b>					
		<b>a) Labour</b>					
		Mate	day	0.440	300.00	132.00	L-12
		Mazdoor	day	9.000	250.00	2250.00	L-13
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	389.00	2800.80	P&M-031
		Air compressor 250 cfm	hour	7.200	516.00	3715.20	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	2880.00	17280.00	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	609.00	3654.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1174.00	7044.00	P&M-004
		Vibratory roller 8-10 tonne weight	hour	6.000	658.00	3948.00	P&M-059
		<b>c) Material</b>					
		Bitumen@ 1.00 kg per sqm	tonne	9.000	49642.00	446778.00	M-074
		Crushed stone chipping, 13 mm nominal size @ 0.01 cum per sqm	cum	90.000	1700.00	153000.00	M-052
		<b>d) Overheads @ 10 % on (a+b+c)</b>				64892.00	
		<b>e) Contractors profit @ 10 % on (a+b+c+d)</b>				71381.20	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 9000 sqm= a+b+c+d+e				785193.20	
		<b>Rate per sqm = (a+b+c+d+e)/9000</b>				87.24	
					<b>say</b>	<b><u>87.00</u></b>	
	<b>Note</b>	1.Where the proposed aggregate fails to pass the stripping test, an approved adhesion agent may be added to the binder as per clause 510.2.4. Alternatively, chips may be pre-coated as per clause 510.2.5					
		2.Input for the second coat, where required, will be the same as per the 1st coat mentioned above					
<b>5.15</b>	<b>516</b>	<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					
	<b>Case I</b>	<b>5 mm thickness</b>					
		<b>Unit = sqm</b>					
		<b>Taking output = 16000 sqm (80 cum)</b>					
		<b>Taking density of 2.2 tonnes per cum, weight of mix = 264 tonnes</b>					
		weight of mix = 176 tonnes					
		<b>a) Labour</b>					
		Mate	day	0.240	300.00	72.00	L-12
		Mazdoor	day	6.000	250.00	1500.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom	hour	6.000	389.00	2334.00	P&M-031
		Air compressor 250 cfm	hour	6.000	516.00	3096.00	P&M-001
		Mobile slurry seal equipment	hour	6.000	1101.00	6606.00	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler.	hour	6.000	609.00	3654.00	P&M-048
		Pneumatic tyred roller with individual wheel load not exceeding 1.5 tonnes	hour	6.000	1359.00	8154.00	P&M-037
		Water tanker 6 KL capacity	hour	2.000	488.00	976.00	P&M-060
		<b>c) Material</b>					
		Residual Binder @ 11 % of mix 80 x 2.2 x 0.11	tonne	19.360	39586.00	766384.96	M-077
		Fine aggregate 4.75 mm and below 87 % of total mix, 80 x 2.2 x 0.87 = 153.12 tonnes. Taking density 1.5, = 153.12/1.5 = 102.08 cum	cum	102.080	540.00	55123.20	M-005
		Filler @ 2 % of total mix = 80 x 2.2 x 0.02	tonne	3.520	11550.00	40656.00	M-188
		Cost of water	KL	12.000	60.00	720.00	M-189
		<b>d) Overheads @ 10 % on (a+b+c)</b>				89679.42	
		<b>e) Contractors profit @ 10 % on (a+b+c+d)</b>				98647.36	
		Cost for 16000 sqm= a+b+c+d+e				1085120.93	
		<b>Rate per sqm = (a+b+c+d+e)/16000</b>				67.82	
					<b>say</b>	<b><u>68.00</u></b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	Case II	3 mm thickness					
		<i>Unit = sqm</i>					
		<i>Taking output = 20000 sqm (60 cum)</i>					
		a) Labour					
		Mate	day	0.200	300.00	60.00	L-12
		Mazdoor	day	5.000	250.00	1250.00	L-13
		b) Machinery					
		Mechanical broom	hour	6.000	389.00	2334.00	P&M-031
		Air compressor 250 cfm	hour	6.000	516.00	3096.00	P&M-001
		Mobile slurry seal equipment	hour	6.000	1101.00	6606.00	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler	hour	6.000	609.00	3654.00	P&M-048
		Water tanker 6 KL capacity	hour	2.000	488.00	976.00	P&M-060
		c) Material					
		Residual Binder @ 13 % of mix = 60 x 2.2 x 0.13	tonne	17.160	39586.00	679295.76	M-077
		Fine aggregate 3 mm and below 85 % of total mix, 60x 2.2 x 0.85 = 112.2 tonnes. Taking density 1.5,	cum	74.800	540.00	40392.00	M-005
		Filler @ 2 % of total mix = 60x 2.2 x 0.02	tonne	2.640	11550.00	30492.00	M-188
		Cost of water	KL	12.000	60.00	720.00	M-189
		d) Overheads @ 10 % on (a+b+c)				77639.38	
		e) Contractors profit @ 10 % on (a+b+c+d)				85403.31	
		Cost for 30000 sqm = a+b+c+d+e				939436.45	
		Rate per sqm = (a+b+c+d+e)/20000				46.97	
					<i>say</i>	<u>47.00</u>	
	Case III	1.5 mm thickness					
		<i>Unit = sqm</i>					
		<i>Taking output = 24000 sqm (36 cum)</i>					
		a) Labour					
		Mate	day	0.200	300.00	60.00	L-12
		Mazdoor	day	5.000	250.00	1250.00	L-13
		b) Machinery					
		Mechanical broom	hour	6.000	389.00	2334.00	P&M-031
		Air compressor 250 cfm	hour	6.000	516.00	3096.00	P&M-001
		Mobile slurry seal equipment	hour	6.000	1101.00	6606.00	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler.	hour	6.000	609.00	3654.00	P&M-048
		Water tanker 6 KL capacity	hour	2.000	488.00	976.00	P&M-060
		c) Material					
		Residual Binder @ 16 % of mix, 36 x 2.2 x 0.16	tonne	12.670	39586.00	501554.62	M-077
		Fine aggregate 2.36 mm and below, 82 % of total mix, 36x 2.2 x 0.82 = 64.94 tonnes. Taking density 1.5	cum	43.300	560.00	24248.00	M-022
		Filler @ 2 % of total mix = 36x 2.2 x 0.02	tonne	1.580	11550.00	18249.00	M-188
		Cost of water	KL	12.000	60.00	720.00	M-189
		d) Overheads @ 10 % on (a+b+c)				57026.56	
		e) Contractors profit @ 10 % on (a+b+c+d)				62729.22	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 24000 sqm= a+b+c+d+e				690021.40	
		<b>Rate per sqm = (a+b+c+d+e)/24000</b>				28.75	
					<b>say</b>	<b><u>29.00</u></b>	
	<b>Note</b>	1.Tack coat, if required to be provided, before laying slurry seal may be measured and paid separately					
<b>5.17</b>	<b>518</b>	<b>Fog Spray</b>					
		Providing and applying low viscosity bitumen emulsion for sealing cracks less than 3 mm wide or incipient fretting or disintegration in an existing bituminous surfacing.					
		<b>Unit = sqm</b>					
		<b>Taking output = 10500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	300.00	36.00	L-12
		Mazdoor	day	3.000	250.00	750.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	389.00	2334.00	P&M-031
		Air compressor 250 cfm	hour	6.000	516.00	3096.00	P&M-001
		Bitumen emulsion pressure distributor @ 1750 sqm per hour	tonne	6.000	1174.00	7044.00	P&M-004
		<b>c) Material</b>					
		Bitumenemulsion @ 0.75 kg per sqm	tonne	7.880	39586.00	311937.68	M-077
		<b>d) Overheads @ 10 % on (a+b+c)</b>				32519.77	
		<b>e) Contractors profit @ 10 % on (a+b+c+d)</b>				35771.74	
		Cost for 10500 sqm= a+b+c+d+e				393489.19	
		<b>Rate per sqm = (a+b+c+d+e)/10500</b>				37.48	
					<b>say</b>	<b><u>37.00</u></b>	
		1.In case it is decided by the engineer to blind the fog spray, the following may be added					
		<b>a) Labour</b>					
		Mate	day	0.160	300.00	48.00	L-12
		Mazdoor for precoating of grit	day	4.000	250.00	1000.00	L-13
		<b>c) Material</b>					
		Crushed stone grit 3 mm size @ 3.75 kg per sqm	cum	26.250	600.00	15750.00	M-024
		Bitumenemulsion for precoating grit @ 2 % of grit,39.38 x 0.02	tonne	0.790	39586.00	31272.94	M-077
						48070.94	
						4.58	
					<b>say</b>	<b><u>5.00</u></b>	
<b>5.21</b>	<b>522</b>	<b>Crack Prevention Courses</b>					
	<b>Case - I</b>	<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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = sqm</b>					
		<b>Taking output = 10500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	300.00	72.00	L-12
		Mazdoor	day	6.000	250.00	1500.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	389.00	2334.00	P&M-031
		Air compressor 250 cfm	hour	6.000	516.00	3096.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1174.00	7044.00	P&M-004
		Hydraulic Chip spreader	hour	6.000	2880.00	17280.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	504.00	3024.00	P&M-044
		<b>c) Material</b>					
		Modified binder	tonne	9.450	44379.00	419381.55	M-078
		Crushed stone aggregates 5.6 mm size	cum	105.000	1740.00	182700.00	M-050
		<b>d) Overheads @ 10 % on (a+b+c)</b>				63643.16	
		<b>e) Contractors profit @ 10 % on (a+b+c+d)</b>				70007.47	
		Cost for 10500 sqm= a+b+c+d+e				770082.18	
		<b>Rate per sqm = (a+b+c+d+e)/10500</b>				73.34	
					<b>say</b>	<b>73.00</b>	
	<b>Case - II</b>	<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	300.00	72.00	L-12
		Mazdoor	day	6.000	250.00	1500.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	389.00	2334.00	P&M-031
		Air compressor 250 cfem capacity	hour	6.000	516.00	3096.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1174.00	7044.00	P&M-004
		Hydraulic Chip spreader	hour	6.000	2880.00	17280.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	504.00	3024.00	P&M-044
		<b>c) Material</b>					
		Modified binder	tonne	11.550	44379.00	512577.45	M-078
		Crushed stone chipping 11.2 mm size	cum	105.000	1750.00	183750.00	M-051
		<b>d) Overheads @ 10 % on (a+b+c)</b>				73067.75	
		<b>e) Contractors profit @ 10 % on (a+b+c+d)</b>				80374.52	
		Cost for 10500 sqm= a+b+c+d+e				884119.71	
		<b>Rate per sqm = (a+b+c+d+e)/10500</b>				84.20	
					<b>say</b>	<b>84.00</b>	
	<b>Case III</b>	<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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = sqm</b>					
		<b>Taking output = 10500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	300.00	72.00	L-12
		Mazdoor	day	6.000	250.00	1500.00	L-13
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	389.00	2334.00	P&M-031
		Air compressor 250 cfem capacity	hour	6.000	516.00	3096.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1174.00	7044.00	P&M-004
		Hydraulic Chip spreader	hour	6.000	2880.00	17280.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	504.00	3024.00	P&M-044
		<b>c) Material</b>					
		Modified binder	tonne	15.750	44379.00	698969.25	M-078
		Crushed stone aggregates 11.2 mm size	cum	126.000	1750.00	220500.00	M-051
		<b>d) Overheads @ 10 % on (a+b+c)</b>				95461.93	
		<b>e) Contractors profit @ 10 % on (a+b+c+d)</b>				105008.12	
		Cost for 10500 sqm= a+b+c+d+e				1155089.29	
		<b>Rate per sqm = (a+b+c+d+e)/10500</b>				110.01	
					<b>say</b>	<b>110.00</b>	
	<b>Case IV</b>	<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					
		<b>Unit = sqm</b>					
		<b>Taking output = 3500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.560	300.00	168.00	L-12
		Mazdoor	day	12.000	250.00	3000.00	L-13
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	2.800	389.00	1089.20	P&M-031
		Air compressor 250 cfem capacity	hour	2.800	516.00	1444.80	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	tonne	2.000	1174.00	2348.00	P&M-004
		Pneumatic roller	hour	2.000	1359.00	2718.00	P&M-037
		<b>c) Material</b>					
		Paving grade bitumen of 80 - 100 penetration @ 1.05 kg per sqm	tonne	3.680	48810.00	179620.80	M-075
		Geotextile including 10 % for overlaps	sqm	3850.000	27.00	103950.00	M-108
		<b>d) Overheads @ 10 % on (a+b+c)</b>				29513.88	
		<b>e) Contractors profit @ 10 % on (a+b+c+d)</b>				32465.27	
		Cost for 10500 sqm= a+b+c+d+e				357117.95	
		<b>Rate per sqm = (a+b+c+d+e)/3500</b>				102.03	
					<b>say</b>	<b>102.00</b>	
	<b>NOTE</b>	As bitumen overlay construction shall follow closely the fabric placement on the same day, an output of 3500 sqm only has been considered for the analysis which will cover a length of 500 m, of 7 m wide carriageway. This can be conveniently overlaid by a bitumenious course in a day					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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					
		<b>ii) 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	0.07	300	21.00	
		Painter 1st class	day	1.25	400	500.00	
		Mazdoor	day	0.50	250	125.00	
		<b>b) Material</b>					
		Paint	Litre	0.50	198	99.00	
		<b>c) Overheads @ 10 % on (a+b)</b>				74.50	
		<b>d) Contractors profit @ 10 % on (a+b+c)</b>				81.95	
		Cost for 1600 cm = a+b+c+d				901.45	
		<b>Rate per cm height per letter = (a+b+c +d)/1600</b>				0.56	
					<b>say</b>	<b>0.60</b>	
8.8	803	<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	0.12	300	36.00	
		Painter	day	2.00	400	800.00	
		Mazdoor	day	1.00	250	250.00	
		<b>b) Material</b>					
		Paint conforming to requirement of clause 803.3.	Litre	6.00	176	1056.00	
		Add for scaffolding @ 1% of labour cost where required				10.56	
		<b>c) Overheads @ 10 % on (a+b)</b>				215.26	
		<b>d) Contractors profit @ 10 % on (a+b+c)</b>				236.78	
		Cost for 40 sqm = a+b+c+d				2604.60	
		<b>Rate per sqm = (a+b+c+d)/40</b>				65.11	
					<b>say</b>	<b>65.00</b>	
8.9	803	<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	0.03	300	9.00	
		Painter	day	0.45	400	180.00	
		Mazdoor	day	0.25	250	62.50	
		<b>b) Material</b>					
		Paint ready mixed approved brand.	Litre	1.25	198	247.50	
		Add @ 1% on cost of material for scaffolding				2.48	
		<b>c) Overheads @ 10 % on (a+b)</b>				50.15	
		<b>d) Contractors profit @ 10 % on (a+b+c)</b>				55.16	
		Cost for 10 sqm = a+b+c+d				606.78	
		<b>Rate per sqm = (a+b+c+d)/10</b>				60.68	
					<b>say</b>	<b>61.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.6	Sub-analysis (A)	Cement mortar1:3 (1cement :3 sand)					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 1 cum</i>					
		<b>a) Materials</b>					
		Cement	MT	0.51	8120.00	4141.20	
		Sand	cum	1.05	540.00	567.00	
		<b>b) Labour</b>					
		Mate	day	0.04	300.00	12.00	
		Mazdoor	day	0.90	250.00	225.00	
		Total Material and Labour = (a+b)				4945.00	
	Sub-analysis (B)	Cement mortar1:2 (1cement :2 sand)					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 1 cum</i>					
		<b>a) Materials</b>					
		Cement	MT	0.67	8120.00	5456.64	
		Sand	cum	0.93	540.00	504.00	
		<b>b) Labour</b>					
		Mate	day	0.04	300.00	12.00	
		Mazdoor	day	0.90	250.00	225.00	
		Total Material and Labour = (a+b)				6198.00	
	Sub-analysis (D)	Cement mortar1:6 (1cement :6 sand)					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 1 cum</i>					
		<b>a) Materials</b>					
		Cement	MT	0.29	8120.00	2338.56	
		Sand	cum	1.20	540.00	648.00	
		<b>b) Labour</b>					
		Mate	day	0.04	300.00	12.00	
		Mazdoor	day	0.90	250.00	225.00	
		Total Material and Labour = (a+b)				3224.00	
12.7	1400	Stone masonry work in cement mortar 1:3 in foundation complete as drawing and Technical Specification					
		<i>Unit = cum</i>					
		<i>Taking output = 5 cum</i>					
	(A)	Square Rubble Coursed Rubble Masonry (first sort)					
		<b>a) Material</b>					
		Stone	cum	5.50	517.00	2843.50	M-169
		Through and bond stone	each	35.00	13.00	455.00	M-182
		(35no.x0.24mx0.24mx0.39m = 0.79 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	1.50	4945.00	7417.50	Item 12.6 (A)
		<b>b) Labour</b>					
		Mate	day	0.66	300.00	198.00	L-12
		Mason	day	7.50	400.00	3000.00	L-11
		Mazdoor	day	9.00	250.00	2250.00	L-13
		<b>c) Overhead charges @ 20 % on (a+b)</b>				3232.80	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1939.68	
		Cost for 5 cum = a+b+c+d				21336.48	
		Rate per cum (a+b+c+d)/5				4267.30	
					<b>say</b>	<b>4267.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	1405.3	<b>B) Random Rubble Masonry</b>					
		( coursed/uncoursed )					
		<b>Unit = cum</b>					
		<b>Taking output = 5 cum</b>					
		<b>a) Material</b>					
		Stone	cum	5.50	517.00	2843.50	
		Through and bond stone	Nos	35.00	13.00	455.00	
		(35nos.x0.24mx0.24mx0.39m = 0.79 cu.m)					
		Cement mortar 1:3 (Rate as in item 12.6 A)	cum	1.55	4945.00	7664.75	
		<b>b) Labour</b>					
		Mate	day	0.62	300.00	186.00	
		Mason	day	6.00	400.00	2400.00	
		Mazdoor	day	9.00	250.00	2250.00	
		<b>c) Overheads @ 20 % on (a+b)</b>				3159.85	
		<b>d) Contractors profit @ 10 % on (a+b+c)</b>				1895.91	
		Cost for 5 cum = a+b+c+d				20855.01	
		<b>Rate per cum (a+b+c+d)/5</b>				4171.00	
					<b>say</b>	<b>4171.00</b>	
	@	The labour already considered in cement mortar has been taken into account while proposing labour for masonry works.					
12.7 (Add)	1400	<b>Stone masonry work in cement mortar 1:6 in foundation complete as drawing and Technical Specification</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 5 cum</b>					
	1405.3	<b>B) Random Rubble Masonry</b>					
		( coursed/uncoursed )					
		<b>Unit = cum</b>					
		<b>Taking output = 5 cum</b>					
		<b>a) Material</b>					
		Stone	cum	5.50	517.00	2843.50	
		Through and bond stone	Nos	35.00	13.00	455.00	
		(35nos.x0.24mx0.24mx0.39m = 0.79 cu.m)					
		Cement mortar 1:3 (Rate as in item 13.6 D)	cum	1.55	3224.00	4997.20	
		<b>b) Labour</b>					
		Mate	day	0.62	300.00	186.00	
		Mason	day	6.00	400.00	2400.00	
		Mazdoor	day	9.00	250.00	2250.00	
		<b>c) Overheads @ 20 % on (a+b)</b>				2626.34	
		<b>d) Contractors profit @ 10 % on (a+b+c)</b>				1575.80	
		Cost for 5 cum = a+b+c+d				17333.84	
		<b>Rate per cum (a+b+c+d)/5</b>				3466.77	
					<b>say</b>	<b>3467.00</b>	
	@	The labour already considered in cement mortar has been taken into account while proposing labour for masonry works.					
12.8	1500, 1700 & 2100	<b>Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications</b>					
	A	<b>PCC Grade M15</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	MT	4.13	8120.00	33535.60	
		Coarse sand	cum	6.75	540.00	3645.00	
		40 mm Aggregate	cum	8.10	1250.00	10125.00	
		20 mm Aggregate	cum	4.05	1600.00	6480.00	
		10 mm Aggregate	cum	1.35	1750.00	2362.50	
		<b>b) Labour</b>					
		Mate	day	0.86	300.00	258.00	
		Mason	day	1.50	400.00	600.00	
		Mazdoor	day	20.00	250.00	5000.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	
		Generator 63 KVA	hour	6.00	545.00	3270.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>4,449.00</b>			
		d) Formwork @ 4% on cost of concrete i.e. cost of material, labour and machinery				2669.12	
		<b>e) Overheads @ 20 % on (a+b+c+d)</b>				13879.44	
		<b>f) Contractors profit @ 10 % on (a+b+c+d+e)</b>				8327.67	
		Cost for 15 cum = a+b+c+d+e+f				91604.34	
		<b>Rate per cum (a+b+c+d+e+f)/15</b>				6106.96	
					<b>say</b>	<b>6107.00</b>	
	<b>Note</b>	Nedle Vibrator is an item of minor T & P which is already included in overhead charges. Hence not added in rate analysis of cement concrete works.					
<b>12.8</b>	<b>B</b>	<b>PCC Grade M20</b>					
		<b>Unit : cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	MT	5.16	8120.00	41899.20	
		Coarse sand	cum	6.75	540.00	3645.00	
		40 mm Aggregate	cum	5.40	1250.00	6750.00	
		20 mm Aggregate	cum	5.40	1600.00	8640.00	
		10 mm Aggregate	cum	2.70	1750.00	4725.00	
		<b>b) Labour</b>					
		Mate	day	0.86	300.00	258.00	
		Mason	day	1.50	400.00	600.00	
		Mazdoor	day	20.00	250.00	5000.00	
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	
		Generator 33 KVA	hour	6.00	407.00	2442.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5,028.00</b>			
<b>12.8</b>	<b>C</b>	<b>RCC Grade M20</b>					
		Unit = cum					
	<b>Case I</b>	<b>Using concrete mixer</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	MT	5.21	8120.00	42305.20	
		Coarse sand	cum	6.75	540.00	3645.00	
		20 mm Aggregate	cum	8.10	1600.00	12960.00	
		10 mm Aggregate	cum	5.40	1750.00	9450.00	
		<b>b) Labour</b>					
		Mate	day	0.86	300.00	258.00	
		Mason	day	1.50	400.00	600.00	
		Mazdoor	day	20.00	250.00	5000.00	
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	
		Generator 33 KVA	hour	6.00	407.00	2442.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5,208.00</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	MT	41.66	8120.00	338279.20	
		Coarse Sand	cum	54.00	540.00	29160.00	
		20 mm Aggregate	cum	64.80	1600.00	103680.00	
		10 mm Aggregate	cum	43.20	1750.00	75600.00	
		<b>b) Labour</b>					
		Mate	day	0.84	300.00	252.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	18.00	250.00	4500.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader 1 cum capacity	hour	6.00	1253.00	7518.00	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	
		Lead beyond 1 km, L-lead in km	T-km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6	279.00	1674.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>4,970.00</b>			
		d) Formwork @ 4% on cost of concrete i.e.cost of material, labour and machinery				23852.61	
		<b>e) Overheads @ 20 % on (a+b+c+d)</b>				124033.56	
		<b>f) Contractors profit @ 10 % on (a+b+c+d+e)</b>				74420.14	
		Cost for 120 cum = a+b+c+d+e+f				818621.51	
		<b>Rate per cum = ( a+b+c+d+e+f )/120</b>				6821.85	
					<b>say</b>	<b>6822.00</b>	
12.8	D	<b>PCC Grade M25</b>					
		Unit = cum					
	<b>Case I</b>	<b>Using concrete Mixer</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	MT	5.99	8120.00	48638.80	
		Coarse sand	cum	6.75	540.00	3645.00	
		40 mm Aggregate	cum	5.40	1250.00	6750.00	
		20 mm Aggregate	cum	5.40	1600.00	8640.00	
		10 mm Aggregate	cum	2.70	1750.00	4725.00	
		<b>b) Labour</b>					
		Mate	day	0.86	300.00	258.00	
		Mason	day	1.50	400.00	600.00	
		Mazdoor	day	20.00	250.00	5000.00	
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	
		Generator 33 KVA	hour	6.00	407.00	2442.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5,477.00</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	MT	47.95	8120.00	389354.00	
		Coarse sand	cum	54.00	540.00	29160.00	
		40 mm Aggregate	cum	43.20	1250.00	54000.00	
		20 mm Aggregate	cum	43.20	1600.00	69120.00	
		10 mm Aggregate	cum	21.60	1750.00	37800.00	
		<b>b) Labour</b>					
		Mate	day	0.84	300.00	252.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	18.00	250.00	4500.00	
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader 1 cum capacity	hour	6.00	1253.00	7518.00	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6	279.00	1674.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5,242.00</b>			
		d) Formwork @ 3.75% of cost of concrete i.e.cost of material, labour and machinery				23588.63	
		<b>e) Overheads @ 20 % on (a+b+c+d)</b>				130523.73	
		<b>f) Contractors profit @ 10 % on (a+b+c+d+e)</b>				78314.24	
		cost of 120 cum = a+b+c+d+e+f				861456.59	
		<b>Rate per cum (a+b+c+d+e+f)/120</b>				7178.80	
					<b>say</b>	<b>7179.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.8	E	RCC Grade M25					
		Unit = cum					
	Case I	Using concrete Mixer					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	MT	6.05	8120.00	49126.00	
		Coarse sand	cum	6.75	540.00	3645.00	
		20 mm Aggregate	cum	8.10	1600.00	12960.00	
		10 mm Aggregate	cum	5.40	1750.00	9450.00	
		b) Labour					
		Mate	day	0.86	300.00	258.00	
		Mason	day	1.50	400.00	600.00	
		Mazdoor	day	20.00	250.00	5000.00	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	
		Generator 33 KVA	hour	6.00	407.00	2442.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5,663.00</b>			
	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit : cum</i>					
		<i>Taking Output = 120 cum</i>					
		a) Material					
		Cement	MT	48.38	8120.00	392845.60	
		Coarse sand	cum	54.00	540.00	29160.00	
		20 mm Aggregate	cum	64.80	1600.00	103680.00	
		10 mm Aggregate	cum	43.20	1750.00	75600.00	
		Admixer	Kg	193.52	55.00	10643.60	
		b) Labour					
		Mate	day	0.84	300.00	252.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	18.00	250.00	4500.00	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader 1 cum capacity 1 cum	hour	6.00	1253.00	7518.00	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6.00	279.00	1674.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5,513.00</b>			
12.8	F	PCC Grade M30					
		Unit = cum					
	Case I	Using Concrete Mixer					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	MT	6.08	8120.00	49369.60	
		Coarse sand	cum	6.75	540.00	3645.00	
		40 mm Aggregate	cum	5.40	1250.00	6750.00	
		20 mm Aggregate	cum	5.40	1600.00	8640.00	
		10 mm Aggregate	cum	2.70	1750.00	4725.00	
		b) Labour					
		Mate	day	0.86	300.00	258.00	
		Mason	day	1.50	400.00	600.00	
		Mazdoor	day	20.00	250.00	5000.00	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	
		Generator 33 KVA	hour	6.00	407.00	2442.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5,526.00</b>			

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit : cum</i>					
		<i>Taking Output = 120 cum</i>					
		<b>a) Material</b>					
		Cement	MT	48.60	8120.00	394632.00	
		Coarse sand	cum	54.00	540.00	29160.00	
		40 mm Aggregate	cum	43.20	1250.00	54000.00	
		20 mm Aggregate	cum	43.20	1600.00	69120.00	
		10 mm Aggregate	cum	21.60	1750.00	37800.00	
		<b>b) Labour</b>					
		Mate	day	0.84	300.00	252.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	18.00	250.00	4500.00	
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader 1 cum capacity	hour	6.00	1253.00	7518.00	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6.00	279.00	1674.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5,286.00</b>			
12.8	G	RCC Grade M30					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		<b>a) Material</b>					
		Cement	MT	6.10	8120.00	49532.00	
		Coarse sand	cum	6.75	540.00	3645.00	
		20 mm Aggregate	cum	8.10	1600.00	12960.00	
		10 mm Aggregate	cum	5.40	1750.00	9450.00	
		<b>b) Labour</b>					
		Mate	day	0.86	300.00	258.00	
		Mason	day	1.50	400.00	600.00	
		Mazdoor	day	20.00	250.00	5000.00	
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	
		Generator 33 KVA	hour	6.00	407.00	2442.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5,690.00</b>			
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		<b>a) Material</b>					
		Cement	MT	48.80	8120.00	396256.00	
		Coarse sand	cum	54.00	540.00	29160.00	
		20 mm Aggregate	cum	64.80	1600.00	103680.00	
		10 mm Aggregate	cum	43.20	1750.00	75600.00	
		<b>b) Labour</b>					
		Mate	day	0.84	300.00	252.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	18.00	250.00	4500.00	
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader 1 cum capacity	hour	6.00	1253.00	7518.00	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6.00	279.00	1674.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5,453.00</b>			

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.8	H	RCC Grade M35					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	MT	6.33	8120.00	51399.60	
		Coarse sand	cum	6.75	540.00	3645.00	
		20 mm Aggregate	cum	8.10	1600.00	12960.00	
		10 mm Aggregate	cum	5.40	1750.00	9450.00	
		b) Labour					
		Mate	day	0.86	300.00	258.00	
		Mason	day	1.50	400.00	600.00	
		Mazdoor	day	20.00	250.00	5000.00	
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	
		Generator 33 KVA	hour	6.00	407.00	2442.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5,814.00</b>			
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit ; cum</i>					
		<i>Taking Output = 120 cum</i>					
		a) Material					
		Cement	MT	50.64	8120.00	411196.80	
		Coarse sand	cum	54.00	540.00	29160.00	
		20 mm Aggregate	cum	64.80	1600.00	103680.00	
		10 mm Aggregate	cum	43.20	1750.00	75600.00	
		Admixer	Kg	202.56	55.00	11140.80	
		b) Labour					
		Mate	day	0.84	300.00	252.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	18.00	250.00	4500.00	
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader 1 cum capacity	hour	6.00	1253.00	7518.00	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6.00	279.00	1674.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5,670.00</b>			
		d) Formwork @ 3% on cost of concrete i.e.cost of material, labour and machinery				20411.21	
		e) Overheads @ 20 % on (a+b+c+d)				140156.96	
		f) Contractors profit @ 10 % on (a+b+c+d+e)				84094.18	
		cost of 120 cum = a+b+c+d+e+f				925035.95	
		Rate per cum (a+b+c+d+e+f)/120				7708.63	
					<b>say</b>	<b>7709.00</b>	
		Rate per cum (a+b+c+d)/120 Excluding OH & CP				<b>5840.00</b>	
	Note:	Where ever concrete is carried out using batching plant, transit mixer, concrete pump, admixers @ 0.4% of weight of cement may be added for achieving desired slump of concrete.					
12.11	1200, 1500 & 1700	Plain/Reinforced cement concrete, in well foundation complete as per drawing and technical specification					
	C	Bottom Plug					
		Concrete to be placed using tremie pipe					
	Case I	Using Concrete Mixer					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	(i)	<b>PCC Grade M20</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		<b>a) Material</b>					
		Cement	MT	5.55	8120.00	45066.00	
		Coarse sand	cum	6.75	540.00	3645.00	
		40 mm Aggregate	cum	5.40	1250.00	6750.00	
		20 mm Aggregate	cum	5.40	1600.00	8640.00	
		10 mm Aggregate	cum	2.70	1750.00	4725.00	
		Admixer	Kg	18.60	55.00	1023.00	
		<b>b) Labour</b>					
		Mate	day	0.90	300.00	270.00	
		Mason	day	1.50	400.00	600.00	
		Mazdoor	day	20.00	250.00	5000.00	
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	
		Generator 33 KVA	hour	6.00	407.00	2442.00	
		Light Crane 3 tonnes capacity for handling tremie pipe	hour	6.00	389.00	2334.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5464.00</b>			
	<b>Note</b>	10% extra cement may be added where under water concreting is involved.					
	<b>Case II</b>	<b>Using Batching Plant, Transit Mixer and Crane/concrete pump</b>					
		<i>Unit ; cum</i>					
		<i>Taking Output = 120 cum</i>					
		<b>a) Material</b>					
		Cement	MT	44.40	8120.00	360528.00	
		Coarse sand	cum	54.00	540.00	29160.00	
		20 mm Aggregate	cum	64.80	1600.00	103680.00	
		10 mm Aggregate	cum	43.20	1750.00	75600.00	
		Admixer	Kg	148.80	55.00	8184.00	
		<b>b) Labour</b>					
		Mate	day	0.88	300.00	264.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	18.00	250.00	4500.00	
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader 1 cum capacity	hour	6.00	1253.00	7518.00	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6.00	279.00	1674.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5223.00</b>			
	(ii)	<b>PCC Grade M25</b>					
	<b>Case I</b>	<b>Using Concrete Mixer</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		<b>a) Material</b>					
		Cement	MT	5.99	8120.00	48638.80	
		Coarse sand	cum	6.75	540.00	3645.00	
		40 mm Aggregate	cum	5.40	1250.00	6750.00	
		20 mm Aggregate	cum	5.40	1600.00	8640.00	
		10 mm Aggregate	cum	2.70	1750.00	4725.00	
		Admixer	Kg	21.60	55.00	1188.00	
		<b>b) Labour</b>					
		Mate	day	0.90	300.00	270.00	
		Mason	day	1.50	400.00	600.00	
		Mazdoor	day	20.00	250.00	5000.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	
		Generator 33 KVA	hour	6.00	407.00	2442.00	
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	389.00	2334.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5713.00</b>			
	<b>Case II</b>	<b>Using Batching Plant, Transit Mixer and Crane/concrete pump</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 120 cum</b>					
		<b>a) Material</b>					
		Cement	MT	47.88	8120.00	388785.60	
		Coarse sand	cum	54.00	540.00	29160.00	
		20 mm Aggregate	cum	64.80	1600.00	103680.00	
		10 mm Aggregate	cum	43.20	1750.00	75600.00	
		Admixer	Kg	172.80	55.00	9504.00	
		<b>b) Labour</b>					
		Mate	day	0.88	300.00	264.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	18.00	250.00	4500.00	
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader 1 cum capacity	hour	6.00	1253.00	7518.00	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6.00	279.00	1674.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5470.00</b>			
	<b>(iii)</b>	<b>PCC Grade M30</b>					
	<b>Case I</b>	<b>Using Concrete Mixer</b>					
		<b>Unit = 1 cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	MT	6.08	8120.00	49369.60	
		Coarse sand	cum	6.75	540.00	3645.00	
		40 mm Aggregate	cum	5.40	1250.00	6750.00	
		20 mm Aggregate	cum	5.40	1600.00	8640.00	
		10 mm Aggregate	cum	2.70	1750.00	4725.00	
		Admixer	Kg	21.60	55.00	1188.00	
		<b>b) Labour</b>					
		Mate	day	0.90	300.00	270.00	
		Mason	day	1.50	400.00	600.00	
		Mazdoor	day	20.00	250.00	5000.00	
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	
		Generator 33 KVA	hour	6.00	407.00	2442.00	
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	389.00	2334.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5762.00</b>			
	<b>Case II</b>	<b>Using Batching Plant, Transit Mixer and Crane/concrete pump</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 120 cum</b>					
		<b>a) Material</b>					
		Cement	MT	48.64	8120.00	394956.80	
		Coarse sand	cum	54.00	540.00	29160.00	
		20 mm Aggregate	cum	64.80	1600.00	103680.00	
		10 mm Aggregate	cum	43.20	1750.00	75600.00	
		Admixer	Kg	172.80	55.00	9504.00	
		<b>b) Labour</b>					
		Mate	day	0.88	300.00	264.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	18.00	250.00	4500.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader 1 cum capacity	hour	6.00	1253.00	7518.00	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6.00	279.00	1674.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Mechniry (a+b+c)</b>		<b>5521.00</b>			
	(iv)	PCC Grade M35					
	<b>Case I</b>	<b>Using Concrete Mixer</b>					
		<b>Unit = 1 cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	MT	6.29	8120.00	51074.80	
		Coarse sand	cum	6.75	540.00	3645.00	
		40 mm Aggregate	cum	5.40	1250.00	6750.00	
		20 mm Aggregate	cum	5.40	1600.00	8640.00	
		10 mm Aggregate	cum	2.70	1750.00	4725.00	
		Admixer	Kg	21.60	55.00	1188.00	
		<b>b) Labour</b>					
		Mate	day	0.90	300.00	270.00	
		Mason	day	1.50	400.00	600.00	
		Mazdoor	day	20.00	250.00	5000.00	
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	
		Generator 33 KVA	hour	6.00	407.00	2442.00	
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	389.00	2334.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Mechniry (a+b+c)</b>		<b>5875.00</b>			
	<b>Case II</b>	<b>Using Batching Plant, Transit Mixer and Crane/concrete pump</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 120 cum</b>					
		<b>a) Material</b>					
		Cement	MT	50.28	8120.00	408273.60	
		Coarse sand	cum	54.00	540.00	29160.00	
		20 mm Aggregate	cum	64.80	1600.00	103680.00	
		10 mm Aggregate	cum	43.20	1750.00	75600.00	
		Admixer	Kg	172.80	55.00	9504.00	
		<b>b) Labour</b>					
		Mate	day	0.88	300.00	264.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	18.00	250.00	4500.00	
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader 1 cum capacity	hour	6.00	1253.00	7518.00	
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6.00	279.00	1674.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Mechniry (a+b+c)</b>		<b>5632.00</b>			
		Add 5% of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreteing with tremie pipe..				31609.08	
		<b>d) Overheads @ 20 % on (a+b+c)</b>				141486.94	
		<b>e) Contractors profit @ 10 % on (a+b+c+d)</b>				84892.16	
		cost of 120 cum = a+b+c+d+e				933813.78	
		<b>Rate per cum (a+b+c+d+e)/120</b>				7781.78	
					<b>Say</b>	<b>7782.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	F	Well cap					
	iv)	RCC Grade M35					
	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	MT	50.64	8120.00	411196.80	
		Coarse sand	cum	54.00	540.00	29160.00	
		20 mm Aggregate	cum	64.80	1600.00	103680.00	
		10 mm Aggregate	cum	43.20	1750.00	75600.00	
		<b>b) Labour</b>					
		Mate	day	0.84	300.00	252.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	18.00	250.00	4500.00	
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader(capacity 1 cum)	hour	6.00	1253.00	7518.00	
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	
		Lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6.00	279.00	1674.00	
		Formwork @ 3% of (a+b+c)				20076.98	
		<b>d) Overheads @ 20 % on (a+b+c)</b>				137861.96	
		<b>e) Contractors profit @ 10 % on (a+b+c+d)</b>				82717.17	
		cost of 120 cum = a+b+c+d+e				909888.91	
		<b>Rate per cum (a+b+c+d+e)/120</b>				7582.41	
					<b>Say</b>	<b>7582.00</b>	
	<b>Note</b>	Where ever concrete is carried out using batching plant, transit mixer, concrete pump, admixers @ 0.4% of weight of cement may be added for achieving desired slump of concrete.					
3.13	304	<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.					
		<b>l) Ordinary soil</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 10 cum</b>					
	<b>A</b>	<b>Manual Means</b>					
		<b>(i) Depth upto 3 m</b>					
		<b>a) Labour</b>					
		Mate	day	0.320	300.00	96.00	L-12
		Mazdoor	day	8.000	250.00	2000.00	L-13
		<b>b) Overheads @ 10 % on (a)</b>				209.60	
		<b>c) Contractors profit @ 10 % on (a+b)</b>				230.56	
		Cost for 10 cum = a+b+c				2536.16	
		<b>Rate per cum = (a+b+c)/10</b>				253.62	
					<b>say</b>	<b>254.00</b>	
	<b>Note</b>	Cost of dewatering may be added where required upto 10 % of labour cost Assessment for dewatering shall be made as per site conditions..					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	<b>B</b>	<b>Mechanical Means</b>					
		(i) Depth upto 3 m					
		<i>Unit = cum</i>					
		<i>Taking output = 300 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.32	300	96.00	
		Mazdoor	day	8.00	250	2000.00	
		<b>b) Machinery</b>					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1571	9426.00	
		<b>c) Overheads @ 10 % on (a+b)</b>				1152.20	
		<b>d) Contractors profit @ 10 % on (a+b+c)</b>				1267.42	
		Cost for 300 cum = a+b+c+d				13941.62	
		<b>Rate per cum = (a+b+c+d)/300</b>				46.47	
					<b>say</b>	<b>46.00</b>	
	<b>Note</b>	Cost of dewatering upto 5% of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions..					
13.6	<b>Section 1600 &amp; 2200</b>	<b>Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications</b>					
		<i>Output : MT</i>					
		<i>Taking output = 1 MT</i>					
		<b>a) Material</b>					
		HYSD bars including 5% overlaps and wastage	MT	1.05	53650.00	56332.50	
		Binding wire	kg	6.00	80.00	480.00	
		<b>b) Labour for cutting, bending, shifting to site, tying and placing in position</b>					
		Mate	day	0.34	300.00	102.00	
		Blacksmith	day	2.00	400.00	800.00	
		Mazdoor	day	6.50	250.00	1625.00	
		<b>c) Overheads @ 20 % on (a+b)</b>				11867.90	
		<b>d) Contractors profit @ 10 % on (a+b+c)</b>				7120.74	
		<b>Rate for per MT (a+b+c+d)</b>				78328.14	
					<b>say</b>	<b>78328.00</b>	
14.1	<b>1500 &amp; 1600 &amp; 1700</b>	<b>Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification</b>					
	<b>A</b>	<b>RCC Grade M20</b>					
	<b>Case II</b>	<b>Using Batching Plant, Transit Mixer and Concrete Pump</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		<b>a) Material</b>					
		Cement	MT	40.92	8120.00	332270.40	
		Coarse sand	cum	54.00	540.00	29160.00	
		20 mm Aggregate	cum	64.80	1600.00	103680.00	
		10 mm Aggregate	cum	43.20	1750.00	75600.00	
		<b>b) Labour</b>					
		Mate	day	0.84	300.00	252.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	18.00	250.00	4500.00	
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader	hour	6.00	1253.00	7518.00	
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1016.00	15240.00	
		Lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6.00	279.00	1674.00	
		<b>Basic Cost of Labour, Material &amp; Mechninery (a+b+c) for 120 cum</b>			<b>590307.00</b>		

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	(i)	<b>For solid slab super-structure, 20-30% of (a+b+c)</b>					
	(p)	<b>Height upto 5m</b>					
		Basic Cost of Labour, Material & Mechnery (a+b+c) for 120 cum				590307.00	
		d) Formwork and staging 20 % of (a+b+c)		20.00		118061.40	
		<b>e) Overheads @ 20 % on (a+b+c+d)</b>				141673.68	
		<b>f) Contractors profit @ 10 % on (a+b+c+d+e)</b>				85004.21	
		Cost for 15 cum = a+b+c+d+e+f				935046.29	
		<b>Rate per cum (a+b+c+d+e+f)/120</b>				7792.05	
					<b>say</b>	<b>7792.00</b>	
	<b>B</b>	<b>RCC Grade M25</b>					
	<b>Case II</b>	<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	MT	47.95	8120.00	389354.00	
		Coarse sand	cum	54.20	540.00	29268.00	
		20 mm Aggregate	cum	64.80	1600.00	103680.00	
		10 mm Aggregate	cum	43.20	1750.00	75600.00	
		<b>b) Labour</b>					
		Mate	day	0.84	300.00	252.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	18.00	250.00	4500.00	
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader	hour	6.00	1253.00	7518.00	
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1016.00	15240.00	
		Lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6.00	279.00	1674.00	
		<b>Basic Cost of Labour, Material &amp; Mechnery (a+b+c) for 120 cum</b>		<b>647498.00</b>			
		<b>For formwork and staging add the following:</b>					
	(i)	<b>For solid slab super-structure, 20-30% of (a+b+c)</b>					
	(p)	<b>Height upto 5m</b>					
		Basic Cost of Labour, Material & Mechnery (a+b+c) for 120 cum				647498.00	
		d) Formwork and staging 20 % of (a+b+c)		20.00		129499.60	
		<b>e) Overheads @ 20 % on (a+b+c+d)</b>				155399.52	
		<b>f) Contractors profit @ 10 % on (a+b+c+d+e)</b>				93239.71	
		Cost for 15 cum= a+b+c+d+e+f				1025636.83	
		<b>Rate per cum (a+b+c+d+e+f)/120</b>				8546.97	
					<b>say</b>	<b>8547.00</b>	
	<b>C</b>	<b>RCC Grade M 30</b>					
	<b>Case II</b>	<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	MT	48.79	8120.00	396174.80	
		Coarse sand	cum	54.60	540.00	29484.00	
		20 mm Aggregate	cum	64.80	1600.00	103680.00	
		10 mm Aggregate	cum	43.20	1750.00	75600.00	
		<b>b) Labour</b>					
		Mate	day	0.88	300.00	264.00	
		Mason	day	3.00	400.00	1200.00	
		Mazdoor	day	19.00	250.00	4750.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader	hour	6.00	1253.00	7518.00	
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1016.00	15240.00	
		Lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6.00	279.00	1674.00	
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>654797.00</b>			
		<b>For formwork and staging add the following:</b>					
	(i)	<b>For solid slab super-structure, 20-30% of (a+b+c)</b>					
	(p)	<b>Height upto 5m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				654797.00	
		d) Formwork and staging 20 % of (a+b+c)		20.00		130959.40	
		<b>e) Overheads @ 20 % on (a+b+c+d)</b>				157151.28	
		<b>f) Contractors profit @ 10 % on (a+b+c+d+e)</b>				94290.77	
		Cost for 15 cum = a+b+c+d+e+f				1037198.45	
		<b>Rate per cum (a+b+c+d+e+f)/120</b>				8643.32	
					<b>say</b>	<b>8643.00</b>	
		<b>Rate per cum (a+b+c+d)/120 ( including formwork and excluding OH &amp; CP)</b>				<b>6548.00</b>	
		<b>Rate per cum (a+b+c+d)/120 ( excluding formwork and Excluding OH &amp; CP)</b>				<b>5457.00</b>	
	E	<b>PSC Grade M-40</b>					
	Case 1	<b>Using concret mixer.</b>					
		<b>Unit = 1 cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	MT	6.45	8120.00	52374.00	
		Coarse sand	cum	6.75	540.00	3645.00	
		20 mm Aggregate	cum	8.10	1600.00	12960.00	
		10 mm Aggregate	cum	5.40	1750.00	9450.00	
		Admixture @ 0.4% of cement	kg	25.80	55.00	1419.00	
		<b>b) Labour</b>					
		Mate	day	0.96	300.00	288.00	
		Mason	day	2.00	400.00	800.00	
		Mazdoor	day	22.00	250.00	5500.00	
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	
		Generator 33 KVA	hour	6.00	407.00	2442.00	
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>		<b>90330.00</b>			
	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	MT	51.60	8120.00	418992.00	
		Coarse sand	cum	54.00	540.00	29160.00	
		20 mm Aggregate	cum	64.80	1600.00	103680.00	
		10 mm Aggregate	cum	43.20	1750.00	75600.00	
		Admixture @ 0.4% of cement	kg	206.40	55.00	11352.00	
		Admixer	Kg	216.00	55.00	11880.00	
		<b>b) Labour</b>					
		Mate	day	0.94	300.00	282.00	
		Mason	day	3.50	400.00	1400.00	
		Mazdoor	day	20.00	250.00	5000.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	
		Generator 100 KVA	hour	6.00	762.00	4572.00	
		Loader	hour	6.00	1253.00	7518.00	
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1016.00	15240.00	
		Lead beyond 1 Km, L - lead in Kilometer	T-Km	300L	0.00	0.00	L= 0
		Concrete Pump	hour	6.00	279.00	1674.00	
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>700990.00</b>			
		<b>For formwork and staging add the following:</b>					
	(i)	<b>For solid slab super-structure, 18-28% of (a+b+c)</b>					
	(p)	<b>Height upto 5m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				700990.00	
		d) Formwork and staging 18 % of (a+b+c)		18.00		126178.20	
		e) <b>Overheads @ 20 % on (a+b+c+d)</b>				165433.64	
		f) <b>Contractors profit @ 10 % on (a+b+c+d+e)</b>				99260.18	
		Cost for 15 cum= a+b+c+d+e+f				1091862.02	
		<b>Rate per cum (a+b+c+d+e+f)/120</b>				9098.85	
					<b>say</b>	<b>9099.00</b>	
	<b>Note</b>	1.Where ever concrete is carried out using batching plant, transit mixer, concrete pump, admixers conforming IS: 9103 @ 0.4% of weight of cement may be added for achieving desired slump of concrete.					
		2. Cement provided for various components of the super structure is for estimating purpose only. Actual quantity of cement will be as per approved mix design. Similarly, the provision for coarse and fine aggregates is for estimating purpose and the exact quantity shall be as per the mix design.					
		3. The items like needle and surface vibrators are part of minor T & P which is already covered under the overhead charges. As such these items have not been added seperately in the rate analysis.					
14.2	1600	<b>A) 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% for laps and wastage	MT	1.05	53650.00	56332.50	
		Binding wire	Kg	8.00	80.00	640.00	
		<b>b) Labour for cutting, bending, tying and placing in position</b>					
		Mate	day	0.44	300.00	132.00	
		Blacksmith	day	3.00	400.00	1200.00	
		Mazdoor	day	8.00	250.00	2000.00	
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>60305.00</b>			

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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8.9	803	<b>Painting on Steel Surfaces with alluminium paint</b>					
		Providing and applying two coats of ready mix alluminium 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	0.03	300	9.00	
		Painter	day	0.45	400	180.00	
		Mazdoor	day	0.25	250	62.50	
		<b>b) Material</b>					
		Paint ready mixed approved brand.	Litre	1.25	180	225.00	
		Add @ 1% on cost of material for scaffolding				2.25	
		<b>c) Overheads @ 10 % on (a+b)</b>				47.88	
		<b>d) Contractors profit @ 10 % on (a+b+c)</b>				52.66	
		Cost for 10 sqm = a+b+c+d				579.29	
		<b>Rate per sqm = (a+b+c+d)/10</b>				57.93	
					<b>say</b>	<b>58.00</b>	

## **A. Roads Works**

### **Basic Notes for Preparation of Schedule of Rates**

The basic approach for the preparation of schedule of rates for Road Works is indicated as under :

#### **Description of items**

1. The description of items is given briefly and linked with the relevant clause of the MoRT&H Specifications for Road and Bridge Works, which may be referred for detailed description, provisions and interpretation.

#### **2. Mechanical Means**

Due to mechanization of construction work, rate for various items have been derived using mechanical means. However, manual means have also been provided for certain cases, where areas may be inaccessible for machines or quantum of work may not be large enough to justify deploy of machines.

#### **3. Overhead Charges**

i. Site accomodation, setting up plant, access road, water supply, electricity and general site arrangements.

ii. Office furniture, equipment and communications.

iii. Expenditure on

a) Corporate office of contractor

b) Site Supervision

c) Documentation and "as built" drawings

iv. Mobilisation/de-mobilisation of resources.

v. Labour camps with minimum amenities and transportation to work sites.

vi. Light vehicles for site supervision including administrative and managerial requirements

vii. Laboratory equipment and quality control including field and laboratory testing

viii. Minor T&P and survey instruments and setting out works, including verification of line, dimensions, trial pits and bore holes, where required

ix. Watch and ward

x. Traffic management during construction

xi. Expenditure on safeguarding environment

xii. Sundries

xiii. Financing Expenditure

xiv. Sales/Turn over tax

xv. Work Insurance/compensation

3.1 10 percent overhead charges has been considered in the schedule of rates

#### **4. Contractor Profit**

10 percent of cost of works. Contractor profit is also added on overhead charges.

## 5. **Basic Inputs**

Basic inputs are only given in the standard data book. The rates for material and labour are as per

## 6. **Plants and Equipment**

- 6.1 A dozer is proposed for excavation where cutting and filling for the roadway is within 100 m. For longer leads, a combination of hydraulic excavator and tipper is proposed.
- 6.2 Keeping in view the job and managerial factors and the age factor of machines, the output of plant and equipment is taken approximately 70 percent of the rated capacity given by manufacture under ideal conditions.
- 6.3 It has been assumed that a water tanker would make one trip per hour on an average. Water charges have not been included for items where the requirement is very nominal. It is assumed that the same would be covered under sundries.
- 6.4 Output of plant/equipment is considered for the compacted quantities.
- 6.5 The usage charges for machines include ownership charges, cost of repair and maintenance including replacement of tyres and running and operating charges which includes crew, fuel and lubricants.

## 7. **Materials**

- 7.1 Quantities of materials considered in the rate are approximate for the purpose of estimating and include normal wastages. Actual consumption would have to be based on mix design.
- 7.2 Arunachal Pradesh has typical and hard terrain having different altitude, wherein maximum construction material are brought from Assam and utilised in different station located in state. Hence, to maintain the uniformity in rates, it is decided to prepare the APSR-2005 without considering any lead on materials and aggregate. The transportation cost shall be included in the estimate as per distance from the source of procurement of material/aggregate. The following sources has been adopted in the schedule 2005.
- (1) All steel items/Bitumen product - Guwahati
  - (2) Cement :- Banderdewa/Bhalukpong/Likabali/Dholla/Margherita
  - (3) Bricks :- Klin in Assam nearby to Arunachal Pradesh
  - (4) Aggregate :- At quarry nearby site of work.
  - (5) Other items :- Average market rates fixed for all district headquarter of state.
  - (6) R.C.C. Hume Pipes :- Naharlagun/Likabali or nearby source in Assam.
- 7.3 The alternative proposal for crushing own aggregate by installing crusher is compared with procurement of crushed aggregates from the market and proposal found economical is adopted.
- 7.4 The specifications of materials shall be governed by section 1000 of MoRT&H Specifications for Road and Bridge Works.

## 8. **Labour**

- 8.1 The average market rate has been adopted which are workable in the state
- 8.2 One mate has been provided for 25 labours

## 9. **Carriage of Materials**

- 9.1 The unit for vehicle for carriage has been taken as under :
- a) In hours where lead is variable. The loading and unloading for such cases have been provided separately.
  - b) In tonne - km where lead is variable. The loading and unloading for such cases have been provided separately.
  - c) Zero lead has been considered for the stone aggregate in order to work out the actual rates of aggregates by adding the transportation cost up to the site of work.
  - d) In case of Hot Mix Plant Zero lead has been considered. The lead may be considered as per actual location of plant.

9.2 Where the quantity of material to be transported is small such as dismantled materials and the same are required to be loaded manually, provision of tractor-trolley has been made instead of tipper.

10. **General :**

- 10.1 The clause numbers refer to MoRT&H Specifications for Road and Bridges Works.
- 10.2 Assumptions made have been indicated in respective chapter in the form of notes, where required.
- 10.3 Sundries to cater for unforeseen contingency and miscellaneous items have been added in the overhead charges.
- 10.4 Arrangement for traffic during construction shall be as per Clause 112 of MoRT&H Specifications for Road and Bridge Works.
- 10.5 Contractor will make his own arrangements for borrowing earth. However, compensation for earth taken from private land has been included in the rate for construction of embankment with borrowed earth.
- 10.6 **Credit for Dismantled Material**
- Credit for dismantled materials has not been included in this schedule of rates. The dismantled materials should be examined and a realistic assessment made for such materials, which can be utilised for works and to be reflected in the estimate.
- 10.7 The source of material and samples are required to be approved by the Engineer before start of any work.
- 10.8 The rates of items include cost of testing of soil, materials and works.
- 10.9 The use of surface by construction vehicles shall be governed by Clause 119 of MoRT&H Specifications.
- 10.10 The contractor shall arrange to provide and maintain an adequate equipment field laboratory as per Clause 121.
- 10.11 Quality Control of works shall be governed by Section 900 of MoRT&H Specifications.
- 10.12 The various activities of works shall also be documented by photographs and video cassettes as per Clauses 125 & 126 of MoRT&H Specifications.
- 10.13 The classification of soil shall be as per Clause 301.2 of MoRT&H Specifications.
- 10.14 The earth excavated from foundations has been considered to be backfilled and balance utilised locally for road work except in the case of marshy soil.

- 10.15 The rate for removal of unsuitable soil does not provide for replacement by suitable soil which will have to be paid separately.
- 10.16 Items for hilly terrain have been analysed separately.
- 10.17 The hire charge rates for machinery and equipment are taken from the Standard Data Book and prevailing market rate.
- 10.18 10 per cent extra cement has been provided for concreting under water, where required.
- 10.19 Grade of cement may be adopted as per mix design.
- 10.20 Quantities of cement in various grades of cement concrete have been taken as per IRC:21-2000 and IRC:18-2000.
- 10.21 The coarse and fine aggregates shall conform to IS:383.
- 10.22 For pricing of RCC slab culverts, the items given in respective chapters in bridge section may be referred.
- 10.23 Some of major steel producing firms have evolved thermo-mechanically treated steel which has enhanced strength, better corrosion resistance, ductility, weld ability and high temperature thermal resistance. Enquiries from these are made on technical specifications and use of such products considered in works based on performance in works where these have already been used.
- 10.24 In case it is decided to include the following items and their maintenance in the BOQ, the scope and specifications should be worked out and defined in a detailed manner in the tender document to avoid any dispute during execution.

MoRT&H Clause    Item

- 120            Site office and furniture for Engineer and his staff.
- 122            Site residential accomodation for Engineer and other supervisory staff.
- 124            Providing and maintaining vehicle for the Engineer.

**GENERAL**  
**Notes -Bridge works**

The basic approach for the preparation of schedule of rates for Bridge works in indicated as under :

1. **Description of items**

The description of items is given briefly and linked with relevant clause of MoRT&H's Specifications for Road and Bridge Works, which may be referred for detailed description, provisions and interpretation.

2. **Overhead Charges**

The rates include over head charges considering the following elements -

- i. Site accomodation, setting up plant, access road, water supply, electricity and general site arrangements.
- ii. Office furniture, equipment and communications.
- iii. Expenditure on
  - a) Corporate office of contractor
  - b) Site Supervision
  - c) Documentation and "as built" drawings
- iv. Mobilisation/de-mobilisation of resources.
- v. Labour camps with minimum amenities and transportation to work sites.
- vi. Light vehicles for site supervision including administrative and managerial
- vii. Laboratory equipment and quality control including field and laboratory testing
- viii. Minor T&P and survey instruments and setting out works, including verification of line, dimensions, trial pits and bore holes, where required
- ix. Watch and ward
- x. Traffic management during construction
- xi. Expenditure on safeguarding environment
- xii. Sundries
- xiii. Financing Expenditure
- xiv. Sales/Turn over tax
- xv. Work Insurance/compensation

3.1 20 percent overhead charges has been considered in the schedule of rates

4. **Contractor Profit**

10 percent of cost of works. Contractor profit is also added on overhead charges.

5. **Basic Inputs**

Basic inputs are only given in the standard data book. The rates for material and labour are as

6. **Plants and Equipment**

The usage/hire charges of machinery/equipment have been worked out based upon present cost of equipments, repairs, POL and Operational charges.

## 7. **Materials**

7.1 Quantities of materials considered in the rate are approximate for the purpose of estimating and include normal wastages. Actual consumption would have to be based on mix design.

7.2 Arunachal Pradesh has typical and hard terrain having different altitude, wherein maximum construction material are brought from Assam and utilised in different station located in state. Hence, to maintain the uniformity in rates, it is decided to prepare the APSR-2005 without considering any lead on materials and aggregate. The transportation cost shall be included in the estimate as per distance from the source of procurement of material/aggregate. The following sources has been adopted in the schedule 2005.

- (1) All steel items/Bitumen product - Guwahati
- (2) Cement :- Banderdewa/Bhalukpong/Likabali/Dholla/Margherita
- (3) Bricks :- Klin in Assam nearby to Arunachal Pradesh
- (4) Aggregate :- At quarry nearby site of work.
- (5) Other items :- Average market rates fixed for all district headquarter of state.
- (6) R.C.C. Hume Pipes :- Naharlagun/Likabali or nearby source in Assam.

7.3 The alternative proposal for crushing own aggregate by installing crusher is compared with procurement of crushed aggregates from the market and proposal found economical is adopted.

7.4 The specifications of materials shall be governed by section 1000 of MoRT&H Specifications for Road and Bridge Works.

## 8. **Labour**

8.1 The average market rate has been adopted which are workable in the state

8.2 One mate has been provided for 25 labours

## 9. **Carriage of Materials**

9.1 The unit for vehicle for carriage has been taken as under :

- a) In hours where lead is variable. The loading and unloading for such cases have been provided separately.
- b) In tonne - km where lead is variable. The loading and unloading for such cases have been provided separately.
- c) Zero lead has been considered for the stone aggregate in order to work out the actual rates of aggregates by adding the transportation cost up to the site of work.

## 10. **General :**

10.1 The clause numbers refer to MoRT&H Specifications for Road and Bridges Works.

10.2 Assumptions made have been indicated in respective chapter in the form of notes, where required.

10.3 Sundries to cater for unforeseen contingency and miscellaneous items have been added in the overhead charges.

10.4 Arrangement for traffic during construction shall be as per Clause 112 of MoRT&H Specifications for Road and Bridge Works.

- 10.5 Contractor will make his own arrangements for borrowing earth. However, compensation for earth taken from private land has been included in the rate for construction of embankment with borrowed earth.
- 10.6 **Credit for Dismantled Material**
- Credit for dismantled materials has not been included in this schedule of rates. The dismantled materials should be examined and a realistic assessment made for such materials, which can be utilised for works and to be reflected in the estimate.
- 10.7 The source of material and samples are required to be approved by the Engineer before start of any work.
- 10.8 The rates of items include cost of testing of soil, materials and works.
- 10.9 The contractor shall arrange to provide and maintain an adequate equipment field laboratory as per Clause 121.
- 10.10 Quality Control of works shall be governed by Section 900 of MoRT&H Specifications.
- 10.11 The various activities of works shall also be documented by photographs and video cassettes as per Clauses 125 & 126 of MoRT&H Specifications.
- 10.12 The classification of soil shall be as per Clause 301.2 of MoRT&H Specifications.
- 10.13 The earth excavated from foundations has been considered to be backfilled and balance utilised locally for road work except in the case of marshy soil.
- 10.14 The rate for removal of unsuitable soil does not provide for replacement by suitable soil which will have to be paid separately.
- 10.15 The hire charge rates for machinery and equipment are taken from the Standard Data Book and prevailing market rate.
- 10.16 10 per cent extra cement has been provided for concreting under water, where required.
- 10.17 Grade of cement may be adopted as per mix design.
- 10.18 Quantities of cement in various grades of cement concrete have been taken as per IRC:21-2000 and IRC:18-2000.
- 10.19 The coarse and fine aggregates shall conform to IS:383.
- 10.20 Some of major steel producing firms have evolved thermo-mechanically treated steel which has enhanced strength, better corrosion resistance, ductility, weld ability and high temperature thermal resistance. Enquiries from these are made on technical specifications and use of such products considered in works based on performance in works where these have already been used.
- 10.21 In case it is decided to include the following items and their maintenance in the BOQ, the scope and specifications should be worked out and defined in a detailed manner in the tender document to avoid any dispute during execution.
11. **Guide Bund**
- 11.1 The item for the guide bund are excavation, embankment and protection works.
- 11.2 In case bridge construction works are to be done on wide and deep water channels in major rivers provision of floating barrages etc. for taking the construction materials and equipments inside water shall be made separately.

11.3 The item for sinking of wells cover diameters from 6 m to 12 and Twin D Type and size 12 m x 6 m. For other shapes like rectangular or any other size, the rates of sinking may be worked out on pro-rata basis.

11.4 The lift for casting of concrete in well steining may be 2 to 2.5 m restricting the free fall of concrete to 1.5 m and concreting layer to 450 mm.

MoRT&H Clause      Item

120                      Site office and furniture for Engineer and his staff.

122                      Site residential accomodation for Engineer and other supervisory staff.

124                      Providing and maintaining vehicle for the Engineer.

## CHAPTER - 1

### CARRIAGE OF MATERIALS

***Preamble:***

- 1 The rate analysis of loading and unloading of various items include stacking.
- 2 The rate analysis for loading and unloading has been given both by manual and mechanical means. Means of loading/unloading appropriate to the work and site is to be adopted.
- 3 The rate analysis for haulage of materials has been made in terms of tonne-kilometre (t.km) for ease of adoption depending upon the lead in km and load in tonnes.
- 4 The cost of carriage will vary depending upon the riding surface of the road. Provision has accordingly been made considering surfaced roads, unsurfaced gravel roads and katcha tracks.
- 5 Analysis for carriage of materials is exclusive of the loading, unloading and stacking and this has to be added as applicable.
- 6 Carriage of materials if done by boats shall be paid at the same rates as given for carriage of materials by road.

CHAPTER-1								
CARRIAGE OF MATERIALS								
Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
1.1		Loading and Unloading of Stone Boulder/Stone aggregates/Sand/Kanker/Moorum.	cum					
		Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip						
		<b>Unit = cum</b>						
		<b>Taking output = 5.5 cum</b>						
		Time required for						
		i) Positioning of tipper at loading point		1 Min				
		ii) Loading by front end loader 1 cum bucket capacity @ 25 cum per hour		13 Min				
		iii) Maneuvering, reversing, dumping and turning for return		2 Min				
		iv) Waiting time, unforeseen contingencies etc		4 Min				
		Total		20 Min				
		<b>a) Machinery</b>						
		Tipper 5.5 tonnes capacity	hour	0.330	609.00	200.97	P&M-048	
		Front end-loader 1 cum bucket capacity @ 25 cum/hour	hour	0.330	1253.00	413.49	P&M-017	
		<b>b) Overhead charges @ 10 % on (a)</b>				61.45		
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				67.59		
		Cost for 5.5 cum = a+b+c				743.50		
		Rate per cum = (a+b+c)/ 5.5				135.18		
		<b>Note</b> Unloading will be by tipping.			<b>say</b>	<b>135.00</b>		
1.2		Loading and Unloading of Boulders by Manual Means						
		<b>Unit = cum</b>						
		<b>Taking output = 5.5 cum</b>						
		<b>a) Labour</b>						
		Mate	day	0.110	300.00	33.00	L-12	
		Mazdoor for loading and unloading	day	0.750	250.00	187.50	L-13	
		<b>b) Machinery</b>						
		Tipper 5.5 tonne capacity	hour	0.750	609.00	456.75	P&M-048	
		<b>c) Overhead charges @ 10 % on (a+b)</b>				67.73		
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				74.50		
		Cost for 5.5 cum = a+b+c+d				819.47		
		Rate per cum = (a+b+c+d)/5.5				149.00		
		<b>Note</b> Unloading will be by tipping.			<b>say</b>	<b>149.00</b>		
1.3		Loading and Unloading of Cement or Steel by Manual Means and Stacking						
		<b>Unit = tonne</b>						
		<b>Taking output = 10 tonnes</b>						
		<b>a) Labour</b>						
		Mate	day	0.080	300.00	24.00	L-12	
		Mazdoor for loading and unloading	day	2.000	250.00	500.00	L-13	
		<b>b) Machinery</b>						
		Truck 10 tonne capacity	hour	2.000	488.00	976.00	P&M-057	
		<b>c) Overhead charges @ 10 % on (a+b)</b>				150.00		
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				165.00		
		Cost for 10 tonnes = a+b+c+d				1815.00		
		Rate per tonnes = (a+b+c+d)/10				181.50		
					<b>say</b>	<b>182.00</b>		

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
1.4		<b>Cost of Haulage Excluding Loading and Unloading</b>					
		Haulage of materials by tipper excluding cost of loading, unloading and stacking.					
		<i>Unit = t.km</i>					
		<i>Taking output 10 tonnes load and lead 10 km = 100 t.km</i>					
	(i)	<b>Surfaced Road</b>					
		Speed with load : 25 km / hour.					
		Speed while Returning empty :35 km / hour.					
		<b>a) Machinery.</b>					
		<b>Tipper 10 tonne capacity</b>					
		Time taken for onward haulage with load	hour	0.400	609.00	243.60	P&M-048
		Time taken for empty return trip.	hour	0.290	609.00	176.61	P&M-048
		<b>b) Overhead charges @ 10 % on (a)</b>				42.02	
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				46.22	
		cost for 100 t km = a+b+c				508.45	
		<b>Rate per t.km = (a+b+c)/100</b>				5.08	
					<i>say</i>	<b>5.10</b>	
1.4	(ii)	<b>Unsurfaced Graveled Road</b>					
		Speed with load: 20 km / hour					
		Speed for empty return trip :30 km / hour					
		<b>a) Machinery</b>					
		<b>Tipper 10 tonnes capacity</b>					
		Time taken for onward haulage with load	hour	0.500	609.00	304.50	P&M-048
		Time taken for empty return trip	hour	0.330	609.00	200.97	P&M-048
		<b>b) Overhead charges @ 10 % on (a)</b>				50.55	
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				55.60	
		Cost for 100 t .km = a+b+c				611.62	
		<b>Rate per t.Km = (a+b+c)/100</b>				6.12	
					<i>say</i>	<b>6.10</b>	
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	609.00	609.00	P&M-048
		Time taken for empty return trip	hour	0.670	609.00	408.03	P&M-048
		<b>b) Overhead charges @ 10 % on (a)</b>				101.70	
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				111.87	
		Cost for 100 t .km = a+b+c				1230.61	
		<b>Rate per t.Km = (a+b+c)/100</b>				12.31	
					<i>say</i>	<b>12.30</b>	

## Chapter – 2

### SITE CLEARANCE

#### **Preamble:**

- 1 Unless otherwise stated, the rates include sorting and disposal of unserviceable material and stacking of serviceable material with all lifts and upto a lead of 1000 m.
- 2 The rates include Tools & Plants (T&P) and scaffolding required for items of dismantling.
- 3 Carriage of dismantled materials, bushes, branches of tree, etc. has been catered with a tractor-trolley of 3 tonnes capacity with manual loading and unloading @ 2 trips per hour within a lead of 1000 m. This will be economical for such works as compared with a tipper.
- 4 The dismantling of structures has been catered both by manual and mechanical means. The Engineer can use his discretion depending upon quantum of work and particular site conditions.
- 5 Rate analysis for removing of stumps and roots has also been provided separately.
- 6 Dismantling of Hume pipes has been catered manually as pipes can be easily rolled by men to a suitable stacking place within the right-of-way.
- 7 For dismantling of structures, which remain submerged in water, the cost may be enhanced by 50 per cent. If site conditions warrant lowering of water level to facilitate dismantling, the cost may be enhanced by additional 25 per cent.
- 8 Dismantling of utilities, like, water supply lines, electric and telephone lines is required to be done under the supervision of concerned departments with prior information to the user public.
- 9 In certain items of dismantling, like, pipe culverts, utilities, etc. excavation in earth and dismantling of masonry works is not included in this analysis for which suitable notes have been inserted in respective Chapters. These items are required to be priced separately based on actual quantities at site and nature of work.
- 10 The dismantled materials should be examined and a realistic assessment and provision should be made after due process for the salvage value for such materials, which can be utilized for works or auctioned.
- 11 In case where lead for disposal is more than 1000 m, extra cost of carriage is required to be added based on tonne-kilometerage as per Chapter 1.
- 12 All minor Tools & Plants (T&P) items required for dismantling have been considered to have been included in overhead charges.

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>						
	(i)	<b>Girth from 300 mm to 600 mm</b>						
		<b>a) Labour</b>						
		Mate	day	0.020	300.00	6.00	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	250.00	150.00	L-13	
		<b>b) Machinery</b>						
		Tractor-trolley	hour	0.100	427.00	42.70	P&M-053	
		<b>c) Overhead charges @ 10 % on (a+b)</b>				19.87		
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				21.86		
		<b>Rate for each tree = a+b+c+d</b>				240.43		
						<b>say</b>	<b><u>240.00</u></b>	
2.1	(ii)	<b>Girth from 600 mm to 900 mm</b>						
		<b>a) Labour</b>						
		Mate	day	0.040	300.00	12.00	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	250.00	225.00	L-13	
		<b>b) Machinery</b>						
		Tractor-trolley	hour	0.300	427.00	128.10	P&M-053	
		<b>c) Overhead charges @ 10 % on (a+b)</b>				36.51		
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				40.16		
		<b>Rate for each tree = a+b+c+d</b>				441.77		
						<b>say</b>	<b><u>442.00</u></b>	
2.1	(iii)	<b>Girth from 900 mm to 1800 mm</b>						
		<b>a) Labour</b>						
		Mate	day	0.080	300.00	24.00	L-12	
		Mazdoors for cutting trees including cutting, refilling, compaction of backfilling and stacking of serviceable materials within 1000 metres	day	2.000	250.00	500.00	L-13	
		<b>b) Machinery</b>						
		Tractor-trolley	hour	0.400	427.00	170.80	P&M-053	
		<b>c) Overhead charges @ 10 % on (a+b)</b>				69.48		
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				76.43		
		<b>Rate for each tree = a+b+c+d</b>				840.71		
						<b>say</b>	<b><u>841.00</u></b>	
2.2	201	<b>Clearing Grass and Removal of Rubbish</b>						
		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	300.00	600.00	L-12	
		Mazdoor	day	50.000	250.00	12500.00	L-13	
		<b>b) Overhead charges @ 10 % on (a)</b>				1310.00		
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				1441.00		
		<b>Rate per Hectare = a+b+c</b>				15851.00		
						<b>say</b>	<b><u>15851.00</u></b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.3	201	<b>Clearing and Grubbing Road Land .</b>					
		Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned, up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.					
		<b>Unit = Hectare</b>					
		<b>Taking output = 1 Hectare</b>					
	(i)	<b>By Manual Means:-</b>					
	A	<b>In area of light jungle</b>					
		a) <b>Labour</b>					
		Mate	day	6.000	300.00	1800.00	L-12
		Mazdoor	day	150.000	250.00	37500.00	L-13
		b) <b>Machinery</b>					
		Tractor-trolley	hour	1.000	427.00	427.00	P&M-053
		c) <b>Overhead charges @ 10 % on (a+b)</b>				3972.70	
		d) <b>Contractor's profit @ 10 % on (a+b+c)</b>				4369.97	
		<b>Rate per Hectare = a+b+c+d</b>				48069.67	
						<b>say</b>	<b><u>48070.00</u></b>
2.3 (i)	B	<b>In area of thorny jungle</b>					
		a) <b>Labour</b>					
		Mate	day	8.000	300.00	2400.00	L-12
		Mazdoor	day	200.000	250.00	50000.00	L-13
		b) <b>Machinery</b>					
		Tractor-trolley	hour	2.000	427.00	854.00	P&M-053
		c) <b>Overhead charges @ 10 % on (a+b)</b>				5325.40	
		d) <b>Contractor's profit @ 10 % on (a+b+c)</b>				5857.94	
		<b>Rate per Hectare = a+b+c+d</b>				64437.34	
						<b>say</b>	<b><u>64437.00</u></b>
2.3	(ii)	<b>By Mechanical Means</b>					
	A	<b>In area of light jungle</b>					
		a) <b>Labour</b>					
		Mate	day	0.160	300.00	48.00	L-12
		Mazdoor	day	4.000	250.00	1000.00	L-13
		b) <b>Machinery</b>					
		Dozer 80 HP with attachment for removal of trees & stumps	hour	10.000	3615.00	36150.00	P&M-014
		Tractor-trolley	hour	1.000	427.00	427.00	P&M-053
		c) <b>Overhead charges @ 10 % on (a+b)</b>				3762.50	
		d) <b>Contractor's profit @ 10 % on (a+b+c)</b>				4138.75	
		<b>Rate per Hectare = a+b+c+d</b>				45526.25	
						<b>say</b>	<b><u>45526.00</u></b>
2.3 (ii)	B	<b>In area of thorny jungle</b>					
		a) <b>Labour</b>					
		Mate	day	0.240	300.00	72.00	L-12
		Mazdoor	day	6.000	250.00	1500.00	L-13
		b) <b>Machinery</b>					
		Dozer 80 HP with attachment for removal of trees & stumps	hour	12.000	3615.00	43380.00	P&M-014
		Tractor-trolley	hour	1.500	427.00	640.50	P&M-053
		c) <b>Overhead charges @ 10 % on (a+b)</b>				4559.25	
		d) <b>Contractor's profit @ 10 % on (a+b+c)</b>				5015.18	
		<b>Rate per Hectare = a+b+c+d</b>				55166.93	
						<b>say</b>	<b><u>55167.00</u></b>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.4	202	<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>Unit = cum</i>					
		<i>Taking output = 1.25 cum</i>					
	(i)	<b>Lime /Cement Concrete</b>					
	I	<b>By Manual Means</b>					
	A	<b>Lime Concrete, cement concrete grade M-10 and below</b>					
		a) <b>Labour</b>					
		Mate	day	0.040	300.00	12.00	L-12
		Mazdoor for dismantling and loading	day	1.000	250.00	250.00	L-13
		b) <b>Machinery</b>					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
		c) <b>Overhead charges @ 10 % on (a+b)</b>				37.73	
		d) <b>Contractor's profit @ 10 % on (a+b+c)</b>				41.50	
		Cost for 1.25 cum = a+b+c+d				456.52	
		Rate per cum = (a+b+c+d)/ 1.25				365.22	
						<b>say</b>	<b><u>365.00</u></b>
2.4 (i)	B	<b>Cement Concrete Grade M-15 &amp; M-20</b>					
		a) <b>Labour</b>					
		Mate	day	0.050	300.00	15.00	L-12
		Mazdoor for dismantling and loading	day	1.250	250.00	312.50	L-13
		b) <b>Machinery</b>					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
		c) <b>Overhead charges @ 10 % on (a+b)</b>				44.28	
		d) <b>Contractor's profit @ 10 % on (a+b+c)</b>				48.71	
		Cost for 1.25 cum = a+b+c+d				535.78	
		Rate per cum = (a+b+c+d)/ 1.25				428.62	
						<b>say</b>	<b><u>429.00</u></b>
2.4 (i)	C	<b>Prestressed / Reinforced cement concrete grade M-20 &amp; above</b>					
		a) <b>Labour</b>					
		Mate	day	0.150	300.00	45.00	L-12
		Blacksmith	day	0.250	400.00	100.00	L-02
		Mazdoor for dismantling, loading and unloading	day	3.500	250.00	875.00	L-13
		b) <b>Machinery</b>					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
		c) <b>Overhead charges @ 10 % on (a+b)</b>				113.53	
		d) <b>Contractor's profit @ 10 % on (a+b+c)</b>				124.88	
		Cost for 1.25 cum = a+b+c+d				1373.70	
		Rate per cum = (a+b+c+d)/ 1.25				1098.96	
						<b>say</b>	<b><u>1099.00</u></b>
2.4	II	<b>By Mechanical Means for items No. 202( b) &amp; ( c)</b>					
	A	<b>Cement Concrete Grade M-15 &amp; M-20</b>					
		a) <b>Labour</b>					
		Mate	day	0.020	300.00	6.00	L-12
		Mazdoor for loading and unloading	day	0.250	250.00	62.50	L-13
		Mazdoor with Pneumatic breaker	day	0.250	300.00	75.00	L-14
		b) <b>Machinery</b>					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1.5 cum per hour	hour	0.670	516.00	345.72	P&M-001
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
		c) <b>Overhead charges @ 10 % on (a+b)</b>				60.45	
		d) <b>Contractor's profit @ 10 % on (a+b+c)</b>				66.50	
		Cost for 1.25 cum = a+b+c+d				731.46	
		Rate per cum = (a+b+c+d)/ 1.25				585.17	
						<b>say</b>	<b><u>585.00</u></b>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.4 II	B	Prestressed / reinforced cement concrete grade M-20 & above					
		a) Labour					
		Mate	day	0.050	300.00	15.00	L-12
		Mazdoor with Pneumatic breaker	day	0.660	300.00	198.00	L-14
		Blacksmith	day	0.250	400.00	100.00	L-02
		Mazdoor for loading and unloading	day	0.250	250.00	62.50	L-13
		b) Machinery					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1.00 cum per hour	hour	1.000	516.00	516.00	P&M-001
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
		c) Overhead charges @ 10 % on (a+b)				100.68	
		d) Contractor's profit @ 10 % on (a+b+c)				110.75	
		Cost for 1.25 cum = a+b+c+d				1218.22	
		Rate per cum = (a+b+c+d)/ 1.25				974.57	
					say	<u>975.00</u>	
2.4	(ii)	Dismantling Brick / Tile work					
	A	In lime mortar					
		a) Labour					
		Mate	day	0.020	300.00	6.00	L-12
		Mazdoor for dismantling, loading and unloading	day	0.500	250.00	125.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
		c) Overhead charges @ 10 % on (a+b)				24.63	
		d) Contractor's profit @ 10 % on (a+b+c)				27.09	
		Cost for 1.25 cum = a+b+c+d				298.01	
		Rate per cum = (a+b+c+d)/ 1.25				238.41	
					say	<u>238.00</u>	
2.4 (ii)	B	In cement mortar					
		a) Labour					
		Mate	day	0.030	300.00	9.00	L-12
		Mazdoor for dismantling, loading and unloading	day	0.750	250.00	187.50	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
		c) Overhead charges @ 10 % on (a+b)				31.18	
		d) Contractor's profit @ 10 % on (a+b+c)				34.30	
		Cost for 1.25 cum = a+b+c+d				377.27	
		Rate per cum = (a+b+c+d)/ 1.25				301.81	
					say	<u>302.00</u>	
2.4 (ii)	C	In mud mortar					
		a) Labour					
		Mate	day	0.016	300.00	4.80	L-12
		Mazdoor for dismantling and loading	day	0.400	250.00	100.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
		c) Overhead charges @ 10 % on (a+b)				22.01	
		d) Contractor's profit @ 10 % on (a+b+c)				24.21	
		Cost for 1.25 cum = a+b+c+d				266.31	
		Rate per cum = (a+b+c+d)/ 1.25				213.05	
					say	<u>213.00</u>	
2.4 (ii)	D	Dry brick pitching or brick soling					
		a) Labour					
		Mate	day	0.014	300.00	4.20	L-12
		Mazdoor for Dismantling, loading and unloading	day	0.350	250.00	87.50	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
		c) Overhead charges @ 10 % on (a+b)				20.70	
		d) Contractor's profit @ 10 % on (a+b+c)				22.77	
		Cost for 1.25 cum = a+b+c+d				250.46	
		Rate per cum = (a+b+c+d)/ 1.25				200.37	
					say	<u>200.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.4	(iii)	Dismantling Stone Masonry					
	A	Rubble stone masonry in lime mortar					
	a)	Labour					
		Mate	day	0.024	300.00	7.20	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.600	250.00	150.00	L-13
	b)	Machinery					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
	c)	Overhead charges @ 10 % on (a+b)				27.25	
	d)	Contractor's profit @ 10 % on (a+b+c)				29.97	
		Cost for 1.25 cum = a+b+c+d				329.71	
		Rate per cum = (a+b+c+d)/ 1.25				263.77	
						<b>say</b>	<b><u>264.00</u></b>
2.4 (iii)	B	Rubble stone masonry in cement mortar.					
	a)	Labour					
		Mate	day	0.030	300.00	9.00	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.750	250.00	187.50	L-13
	b)	Machinery					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
	c)	Overhead charges @ 10 % on (a+b)				31.18	
	d)	Contractor's profit @ 10 % on (a+b+c)				34.30	
		Cost for 1.25 cum = a+b+c+d				377.27	
		Rate per cum = (a+b+c+d)/ 1.25				301.81	
						<b>say</b>	<b><u>302.00</u></b>
2.4 (iii)	C	Rubble Stone Masonry in mud mortar.					
	a)	Labour					
		Mate	day	0.020	300.00	6.00	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.500	250.00	125.00	L-13
	b)	Machinery					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
	c)	Overhead charges @ 10 % on (a+b)				24.63	
	d)	Contractor's profit @ 10 % on (a+b+c)				27.09	
		Cost for 1.25 cum = a+b+c+d				298.01	
		Rate per cum = (a+b+c+d)/ 1.25				238.41	
						<b>say</b>	<b><u>238.00</u></b>
2.4 (iii)	D	Dry rubble masonry					
	a)	Labour					
		Mate	day	0.018	300.00	5.40	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.450	250.00	112.50	L-13
	b)	Machinery					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
	c)	Overhead charges @ 10 % on (a+b)				23.32	
	d)	Contractor's profit @ 10 % on (a+b+c)				25.65	
		Cost for 1.25 cum = a+b+c+d				282.16	
		Rate per cum = (a+b+c+d)/ 1.25				225.73	
						<b>say</b>	<b><u>226.00</u></b>
2.4 (iii)	E	Dismantling stone pitching/ dry stone spalls.					
	a)	Labour					
		Mate	day	0.016	300.00	4.80	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.400	250.00	100.00	L-13
	b)	Machinery					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
	c)	Overhead charges @ 10 % on (a+b)				22.01	
	d)	Contractor's profit @ 10 % on (a+b+c)				24.21	
		Cost for 1.25 cum = a+b+c+d				266.31	
		Rate per cum = (a+b+c+d)/ 1.25				213.05	
						<b>say</b>	<b><u>213.00</u></b>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.4 (iii)	F	Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials.					
		a) Labour					
		Mate	day	0.020	300.00	6.00	L-12
		Mazdoor for dismantling, loading and unloading	day	0.500	250.00	125.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
		c) Overhead charges @ 10 % on (a+b)				24.63	
		d) Contractor's profit @ 10 % on (a+b+c)				27.09	
		Cost for 1.25 cum = a+b+c+d				298.01	
		Rate per cum = (a+b+c+d)/ 1.25				238.41	
					say	<u>238.00</u>	
2.4	(iv)	Wood Work wrought framed and fixed in frames of trusses upto a height of 5 m above plinth level					
		a) Labour					
		Mate	day	0.060	300.00	18.00	L-12
		Carpenter	day	0.500	400.00	200.00	L-04
		Mazdoor for dismantling, loading and unloading.	day	1.000	250.00	250.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	427.00	115.29	P&M-053
		c) Overhead charges @ 10 % on (a+b)				58.33	
		d) Contractor's profit @ 10 % on (a+b+c)				64.16	
		Cost for 1.25 cum = a+b+c+d				705.78	
		Rate per cum = (a+b+c+d)/ 1.25				564.62	
					say	<u>565.00</u>	
2.4	(v)	Steel Work in all types of sections upto a height of 5 m above plinth level excluding cutting of rivet.					
		<i>Unit = tonne</i>					
		<i>Taking output = 1 tonne</i>					
	A	Including dismembering					
		a) Labour					
		Mate	day	0.140	300.00	42.00	L-12
		Blacksmith	day	1.000	400.00	400.00	L-02
		Mazdoor for dismantling, loading and unloading	day	2.500	250.00	625.00	L-13
		Add 2.5 per cent of cost of labour for gas cutting, ropes, pulleys etc.				26.68	
		b) Machinery					
		Tractor-trolley	hour	0.170	427.00	72.59	P&M-053
		c) Overhead charges @ 10 % on (a+b)				116.63	
		d) Contractor's profit @ 10 % on (a+b+c)				128.29	
		Rate per tonne = a+b+c+d				1411.18	
					say	<u>1411.00</u>	
2.4 (v)	B	Excluding dismembering.					
		a) Labour					
		Mate	day	0.220	300.00	66.00	L-12
		Mazdoor for dismantling, loading and unloading	day	2.000	250.00	500.00	L-13
		Blacksmith	day	0.500	400.00	200.00	L-02
		Add 2.5 per cent of cost of labour for gas cutting, ropes, pulleys etc.				19.15	
		b) Machinery					
		Tractor-trolley	hour	0.170	427.00	72.59	P&M-053
		c) Overhead charges @ 10 % on (a+b)				85.77	
		d) Contractor's profit @ 10 % on (a+b+c)				94.35	
		Rate per tonne = a+b+c+d				1037.87	
					say	<u>1038.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.4 (v)		C	Extra over item No(v) A and(v) B for cutting rivets.					
			<i>Unit = each</i>					
			<i>Taking output = 10 rivets</i>					
			a) Labour					
			Mate	day	0.010	300.00	3.00	L-12
			Blacksmith	day	0.130	400.00	52.00	L-02
			Mazdoor	day	0.130	250.00	32.50	L-13
			b) Overhead charges @ 10 % on (a)				8.75	
			c) Contractor's profit @ 10 % on (a+b)				9.63	
			Cost for 10 rivets = a+b+c				105.88	
			Rate for each rivet = ( a+b+c)/10				10.59	
							<b>say</b>	<b><u>11.00</u></b>
2.4		(vi)	Scraping of Bricks Dismantled from Brick Work including Stacking.					
			<i>Unit = numbers</i>					
			<i>Taking output = 1000 numbers</i>					
			A In lime/Cement mortar					
			a) Labour					
			Mate	day	0.140	300.00	42.00	L-12
			Mazdoor	day	3.500	250.00	875.00	L-13
			b) Overhead charges @ 10 % on (a)				91.70	
			c) Contractor's profit @ 10 % on (a+b)				100.87	
			Rate per1000 Nos = a+b+c				1109.57	
							<b>say</b>	<b><u>1110.00</u></b>
2.4 (iv)		B	In mud mortar					
			a) Labour					
			Mate	day	0.050	300.00	15.00	L-12
			Mazdoor	day	1.250	250.00	312.50	L-13
			b) Overhead charges @ 10 % on (a)				32.75	
			c) Contractor's profit @ 10 % on (a+b)				36.03	
			Rate per1000 Nos = a+b+c				396.28	
							<b>say</b>	<b><u>396.00</u></b>
2.4		(vii)	Scraping of Stone from Dismantled Stone Masonry					
			<i>Unit = cum</i>					
			<i>Taking output = 1 cum</i>					
			A In cement and lime mortar					
			a) Labour					
			Mate	day	0.060	300.00	18.00	L-12
			Mazdoor	day	1.400	250.00	350.00	L-13
			b) Overhead charges @ 10 % on (a)				36.80	
			c) Contractor's profit @ 10 % on (a+b)				40.48	
			Rate per cum = a+b+c				445.28	
							<b>say</b>	<b><u>445.00</u></b>
2.4 (vii)		B	In Mud mortar					
			a) Labour					
			Mate	day	0.010	300.00	3.00	L-12
			Mazdoor	day	0.300	250.00	75.00	L-13
			b) Overhead charges @ 10 % on (a)				7.80	
			c) Contractor's profit @ 10 % on (a+b)				8.58	
			Rate per cum = a+b+c				94.38	
							<b>say</b>	<b><u>94.00</u></b>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.4	(viii)	Scarping Plaster in Lime or Cement Mortar from Brick/ Stone Masonry					
		<i>Unit = sqm</i>					
		<i>Taking output = 100 sqm</i>					
		a) Labour					
		Mate	day	0.160	300.00	48.00	L-12
		Mazdoor for scarping and loading	day	4.000	250.00	1000.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.320	427.00	136.64	P&M-053
		c) Overhead charges @ 10 % on (a+b)				118.46	
		d) Contractor's profit @ 10 % on (a+b+c)				130.31	
		Cost for 100 sqm = a+b+c+d				1433.41	
		Rate per sqm = (a+b+c+d)/100				14.33	
						<b>say</b>	<b>14.00</b>
2.4	(ix)	Removing all type of Hume Pipes and Stacking within a lead of 1000 metres including Earthwork and Dismantling of Masonry Works.					
		<i>Unit = metre</i>					
		<i>Taking output = 1 metre</i>					
		A Up to 600 mm dia					
		a) Labour					
		Mate	day	0.020	300.00	6.00	L-12
		Mazdoor	day	0.520	250.00	130.00	L-13
		b) Overhead charges @ 10 % on (a)				13.60	
		c) Contractor's profit @ 10 % on (a+b)				14.96	
		Rate per metre = a+b+c				164.56	
						<b>say</b>	<b>165.00</b>
2.4 (ix)		B Above 600 mm to 900 mm dia					
		a) Labour					
		Mate	day	0.030	300.00	9.00	L-12
		Mazdoor	day	0.700	250.00	175.00	L-13
		b) Overhead charges @ 10 % on (a)				18.40	
		c) Contractor's profit @ 10 % on (a+b)				20.24	
		Rate per metre = a+b+c				222.64	
						<b>say</b>	<b>223.00</b>
2.4 (ix)		C Above 900 mm					
		a) Labour					
		Mate	day	0.050	300.00	15.00	L-12
		Mazdoor	day	1.200	250.00	300.00	L-13
		b) Overhead charges @ 10 % on (a)				31.50	
		c) Contractor's profit @ 10 % on (a+b)				34.65	
		Rate per metre = a+b+c				381.15	
						<b>say</b>	<b>381.00</b>
		<b>Note</b>					
		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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.5	202	<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>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
	I	<b>By Manual Means</b>					
	A	<b>Bituminous courses</b>					
		a) <b>Labour</b>					
		Mate	day	0.060	300.00	18.00	L-12
		Mazdoor for dismantling, loading and unloading	day	1.500	250.00	375.00	L-13
		b) <b>Machinery</b>					
		Tractor-trolley	hour	0.380	427.00	162.26	P&M-053
		c) <b>Overhead charges @ 10 % on (a+b)</b>				55.53	
		d) <b>Contractor's profit @ 10 % on (a+b+c)</b>				61.08	
		<b>Rate per cum = a+b+c+d</b>				671.86	
					<b>say</b>	<b>672.00</b>	
2.5 I	B	<b>Granular courses</b>					
		a) <b>Labour</b>					
		Mate	day	0.040	300.00	12.00	L-12
		Mazdoor for dismantling, loading and unloading.	day	1.000	250.00	250.00	L-13
		b) <b>Machinery</b>					
		Tractor-trolley	hour	0.330	427.00	140.91	P&M-053
		c) <b>Overhead charges @ 10 % on (a+b)</b>				40.29	
		d) <b>Contractor's profit @ 10 % on (a+b+c)</b>				44.32	
		<b>Rate per cum = a+b+c+d</b>				487.52	
					<b>say</b>	<b>488.00</b>	
2.5	II	<b>By Mechanical Means</b>					
	A	<b>Bituminous course</b>					
		a) <b>Labour</b>					
		Mate	day	0.010	300.00	3.00	L-12
		Mazdoor	day	0.300	250.00	75.00	L-13
		b) <b>Machinery</b>					
		Tractor-trolley	hour	0.380	427.00	162.26	P&M-053
		Farm tractor with ripper @ 60 cum per hour	hour	0.017	377.00	6.41	P&M-055
		c) <b>Overhead charges @ 10 % on (a+b)</b>				24.67	
		d) <b>Contractor's profit @ 10 % on (a+b+c)</b>				27.13	
		<b>Rate per cum = a+b+c+d</b>				298.47	
					<b>say</b>	<b>298.00</b>	
2.6	202	<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					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) <b>Labour</b>					
		Mate	day	0.030	300.00	9.00	L-12
		Semi skilled mazdoor for operating pneumatic tools	day	0.500	300.00	150.00	L-14
		Mazdoors as helpers including loading and unloading	day	0.500	250.00	125.00	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Air compressor 250 cfm with two leads for pneumatic cutters/ hammers @ 1 cum per hour	hour	1.000	516.00	516.00	P&M-001
		Tractor-trolley	hour	0.400	427.00	170.80	P&M-053
		Joint Cutting Machine with 2-3 blades	hour	1.000	97.00	97.00	P&M-083
		<b>c) Overhead charges @ 10 % on (a+b)</b>				106.78	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				117.46	
		<b>Rate per cum = a+b+c+d</b>				1292.04	
					<b>say</b>	<b>1292.00</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.					
<b>2.7</b>	<b>202</b>	<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	300.00	1.80	L-12
		Mazdoor including loading and unloading	day	0.150	250.00	37.50	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.050	427.00	21.35	P&M-053
		<b>c) Overhead charges @ 10 % on (a+b)</b>				6.07	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				6.67	
		<b>Rate per metre = a+b+c+d</b>				73.39	
					<b>say</b>	<b>73.00</b>	
<b>2.8</b>	<b>202</b>	<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	300.00	3.00	L-12
		Mazdoor including loading and unloading	day	0.150	250.00	37.50	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.200	427.00	85.40	P&M-053
		<b>c) Overhead charges @ 10 % on (a+b)</b>				12.59	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				13.85	
		Cost for 10 m = a+b+c+d				152.34	
		<b>Rate per metre = (a+b+c+d)/10</b>				15.23	
					<b>say</b>	<b>15.00</b>	
<b>2.9</b>	<b>202</b>	<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	300.00	4.50	L-12
		Mazdoor including loading and unloading	day	0.225	250.00	56.25	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.300	427.00	128.10	P&M-053
		<b>c) Overhead charges @ 10 % on (a+b)</b>				18.89	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				20.77	
		Cost for 10 m = a+b+c+d				228.51	
		<b>Rate per metre = (a+b+c+d)/10</b>				22.85	
					<b>say</b>	<b>23.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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.					
		<i>Unit = Each</i>					
		<i>Taking output = one KM stone</i>					
	<b>A</b>	<b>5th KM stone</b>					
		Quantity of cement concrete = 0.392 cum					
		<b>a) Labour</b>					
		Mate	day	0.130	300.00	39.00	L-12
		Mazdoor	day	0.750	250.00	187.50	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.150	427.00	64.05	P&M-053
		<b>c) Overhead charges @ 10 % on (a+b)</b>				29.06	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				31.96	
		<b>Rate for one 5th KM stone = a+b+c+d</b>				351.57	
						<b>say</b>	<b>352.00</b>
	<b>B</b>	<b>Ordinary KM Stone</b>					
		Quantity of cement concrete = 0.269 cum					
		<b>a) Labour</b>					
		Mate	day	0.020	300.00	6.00	L-12
		Mazdoor	day	0.500	250.00	125.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.100	427.00	42.70	P&M-053
		<b>c) Overhead charges @ 10 % on (a+b)</b>				17.37	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				19.11	
		<b>Rate for one ordinary KM stone = a+b+c+d</b>				210.18	
						<b>say</b>	<b>210.00</b>
	<b>C</b>	<b>Hectometre Stone</b>					
		Quantity of cement concrete = 0.048 cum					
		<b>a) Labour</b>					
		Mate	day	0.004	300.00	1.20	L-12
		Mazdoor	day	0.100	250.00	25.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.020	427.00	8.54	P&M-053
		<b>c) Overhead charges @ 10 % on (a+b)</b>				3.47	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				3.82	
		<b>Rate for one Hectometre stone = a+b+c+d</b>				42.04	
						<b>say</b>	<b>42.00</b>
2.11	202	<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.					
		<i>Unit = running metre</i>					
		<i>Taking output = 30 metres</i>					
		<b>a) Labour</b>					
		Mate	day	0.150	300.00	45.00	L-12
		Mazdoor including loading and unloading	day	3.000	250.00	750.00	L-13
		Blacksmith	day	0.750	400.00	300.00	L-02
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.150	427.00	64.05	P&M-053
		<b>c) Overhead charges @ 10 % on (a+b)</b>				115.91	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				127.50	
		Cost for 30 metres = a+b+c+d				1402.45	
		<b>Rate per metre = (a+b+c+d)/30</b>				46.75	
						<b>say</b>	<b>47.00</b>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.12	202	<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					
		<i>Unit = running metre</i>					
		<i>Taking output = 10 metres</i>					
		<b>a) Labour</b>					
		Mate	day	0.090	300.00	27.00	L-12
		Mazdoor	day	2.000	250.00	500.00	L-13
		Plumber	day	0.250	400.00	100.00	L-02
		<b>b) Machinery</b>					
		Truck 10 tonne capacity	hour	0.250	488.00	122.00	P&M-057
		Light Crane 3 tonne capacity	hour	0.500	389.00	194.50	P&M-013
		<b>c) Overhead charges @ 10 % on (a+b)</b>				94.35	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				103.79	
		Cost for 10 metres = a+b+c+d				1141.64	
		<b>Rate per metre = (a+b+c+d)/10</b>				114.16	
					<b>say</b>	<b>114.00</b>	
		<b>Note</b> The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.					
2.13	202	<b>Removal of Cement Concrete Pipe of Sewer Gutter</b>					
		Removal of cement concrete pipe of sewer gutter 1500 mm dia under the supervision of concerned department including disposal with all lifts and up to a lead of 1000 metres and stacking of serviceable and unserviceable material separately but excluding earth excavation and dismantling of masonry works.					
		<i>Unit = running metre</i>					
		<i>Taking output = 10 metres</i>					
		<b>a) Labour</b>					
		Mate	day	0.100	300.00	30.00	L-12
		Mazdoor	day	2.500	250.00	625.00	L-13
		<b>b) Machinery</b>					
		Crane 5 tonne capacity	hour	0.300	666.00	199.80	P&M-070
		Truck flat body 10 tonne	hour	1.000	488.00	488.00	P&M-057
		<b>c) Overhead charges @ 10 % on (a+b)</b>				134.28	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				147.71	
		Cost for 10 metres = a+b+c+d				1624.79	
		<b>Rate per metre = (a+b+c+d)/10</b>				162.48	
					<b>say</b>	<b>162.00</b>	
		<b>Note</b> The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.					
2.14	202	<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					
		<i>Unit = each</i>					
		<i>Taking output = 30 Nos</i>					
		<b>a) Labour</b>					
		Mate	day	0.480	300.00	144.00	L-12
		Mazdoor	day	10.000	250.00	2500.00	L-13
		Electrician/Lineman	day	2.000	400.00	800.00	L-02
		<b>b) Machinery</b>					
		Tractor-trolley	hour	1.500	427.00	640.50	P&M-053
		<b>c) Overhead charges @ 10 % on (a+b)</b>				408.45	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				449.30	
		Cost for 30 poles = a+b+c+d				4942.25	
		<b>Rate per pole = (a+b+c+d)/30</b>				164.74	
					<b>say</b>	<b>165.00</b>	

## Chapter – 3

### EARTHWORK, EROSION CONTROL AND DRAINAGE

#### Preamble:

- 1 The rates have been analysed using mechanical means. Manual means for certain items have also been provided which can be used for areas inaccessible to machines and also for small jobs.
- 2 In the rate analyses of earthwork, compacted volume of earth has been considered.
- 3 Cutting of earth by dozer has been proposed where the cut earth can be utilized for filling for embankment within a lead upto 100 m.
- 4 Where lead for transporting of earth is more than 100 m, excavator and tipper have been provided.
- 5 The rate caters for disposal of unsuitable soil only upto a distance of 1 km. The cost of transportation beyond the initial lead of 1 km will be paid separately based on tonne-kilometerage.
- 6 The replacement of unsuitable soil by suitable soil shall be provided separately in the estimate. The rate analysis for removal of unsuitable soil does not provide for replacement by suitable soil.
- 7 In cases where embankment is constructed with earth taken from roadway, the cost of depositing the earth at the site of embankment is already included in the disposal of excavated earth and, therefore, the input of dozer for spreading earth can be deleted.
- 8 For narrow and restricted areas, plate compactor has been proposed for compaction to achieve the desired density.
- 9 In case excavated rock is found suitable for incorporation in works, suitable credit for the available rock shall be given.
- 10 For excavation of structures refer to Chapter 11 dealing with items of Foundation.
- 11 The possibility of using the blasted rock fragments for backfilling behind structures or backfilling of foundation pits or filling in medians/separators or use in service road shall be examined before proposing disposal of excavated rock.
- 12 For inhabited areas, controlled blasting with limited charges of explosives has been provided. This involves smaller drill holes and additional requirement of electric detonators. Provision has been made accordingly.
- 13 Any work involved for crossing of water courses for irrigation purpose, etc. will be priced under respective items, like, excavation, grubbing, clearing, etc. for which rate analysis have separately been made.
- 14 Earth excavated from drains can be used in roadway berms. Hence carriage for disposal of same is not provided.
- 15 In case of rock fill embankment, it is assumed that material is available at site from rock cutting.

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.					
			<i>Unit = cum</i>					
			<i>Taking output = 120 cum</i>					
			<b>a) Labour</b>					
			Mate	day	1.800	300.00	540.00	L-12
			Mazdoor	day	45.000	250.00	11250.00	L-13
			<b>b) Machinery</b>					
			Truck 5.5 cum capacity	hour	10.000	488.00	4880.00	P&M-057
			<b>c) Overhead charges @ 10 % on (a+b)</b>				1667.00	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1833.70	
			Cost of 120 cum = a+b+c+d				20170.70	
			<b>Rate per cum = (a+b+c+d)/120</b>				168.09	
						<b>say</b>	<b>168.00</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					
			<i>Unit = cum</i>					
			<i>Taking output = 120 cum</i>					
			<b>a) Labour</b>					
			Mate	day	2.800	300.00	840.00	L-12
			Mazdoor	day	70.000	250.00	17500.00	L-13
			<b>b) Machinery</b>					
			Truck 5.5 cum capacity	hour	10.000	488.00	4880.00	P&M-057
			<b>c) Overhead charges @ 10 % on (a+b)</b>				2322.00	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2554.20	
			Cost for 120 cum = a+b+c+d				28096.20	
			<b>Rate per cum = (a+b+c+d)/120</b>				234.14	
						<b>say</b>	<b>234.00</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.					
			<i>Unit = cum</i>					
			<i>Taking output = 180 cum</i>					
			<b>a) Labour</b>					
			Mate	day	0.080	300.00	24.00	L-12
			Mazdoor	day	2.000	250.00	500.00	L-13
			<b>b) Machinery</b>					
			Dozer, 80 HP @ 30 cum per hour	hour	6.000	3615.00	21690.00	P&M-014
			<b>c) Overhead charges @ 10 % on (a+b)</b>				2221.40	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2443.54	
			Cost for 180 cum = a+b+c+d				26878.94	
			<b>Rate per cum = (a+b+c+d)/180</b>				149.33	
						<b>say</b>	<b>149.00</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	300.00	36.00	L-12
		Mazdoor	day	3.000	250.00	750.00	L-13
		<b>b) Machinery</b>					
		Dozer, 80 HP @ 20 cum per hour	hour	6.000	3615.00	21690.00	P&M-014
		<b>c) Overhead charges @ 10 % on (a+b)</b>				2247.60	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2472.36	
		Cost for 108 cum = a+b+c+d				27195.96	
		<b>Rate per cum = (a+b+c+d)/108</b>				251.81	
					<b>say</b>	<b>252.00</b>	
3.5	301	<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					
		<b>Unit = cum</b>					
		<b>Taking Output = 180 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.220	300.00	66.00	L-12
		Mazdoor	day	3.000	250.00	750.00	L-13
		Driller	day	2.000	300.00	600.00	L-06
		Blaster	day	0.250	300.00	75.00	L-03
		<b>b) Machinery</b>					
		Dozer, 80 HP @ 30 cum per hour	hour	6.000	3615.00	21690.00	P&M-014
		Air compressor, 250 cfm with 2 jack hammer	hour	6.000	516.00	3096.00	P&M-001
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 10 tonne capacity	hour	11.250	609.00	6851.25	P&M-048
		<b>c) Materials</b>					
		Gelatin 80 per cent	kg	63.000	148.00	9324.00	M-104
		Electric Detonators @ 1 detonator for 2 gelatin sticks of 125 gms each	each	252.000	9.90	2494.80	M-094 /100
		Credit for excavated rock found suitable for use @ 50 per cent quantity blasted	cum	90.000	(231.00)	(20790.00)	M-089
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				3167.51	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				3484.26	
		Cost for 180 cum = a+b+c+d+e				38326.81	
		<b>Rate per cum = (a+b+c+d+e)/180</b>				212.93	
					<b>say</b>	<b>213.00</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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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					
		<i>Unit = cum</i>					
		<i>Taking output = 360 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.080	300.00	24.00	L-12
		Mazdoor	day	2.000	250.00	500.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator 0.9 cum bucket capacity @ 60 cum per hour	hour	6.000	1571.00	9426.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	16.000	609.00	9744.00	P&M-048
		<b>c) Overhead charges @ 10 % on (a+b)</b>				1969.40	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2166.34	
		Cost for 360 cum = a+b+c+d				23829.74	
		<b>Rate per cum = (a+b+c+d)/360</b>				66.19	
					<b>say</b>	<b>66.00</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.					
		<i>Unit = cum</i>					
		<i>Taking output = 240 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.080	300.00	24.00	L-12
		Mazdoor	day	2.000	250.00	500.00	L-13
		<b>b) Machinery</b>					
		Hydraulic Excavator 0.90 cum bucket capacity @ 36 cum per hour	hour	6.000	1571.00	9426.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	11.000	609.00	6699.00	P&M-048
		<b>c) Overhead charges @ 10 % on (a+b)</b>				1664.90	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1831.39	
		Cost for 240 cum = a+b+c+d				20145.29	
		<b>Rate per cum = (a+b+c+d)/240</b>				83.94	
					<b>say</b>	<b>84.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.8	301	<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.					
	<b>A</b>	<b>Mechanised</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 36 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.400	300.00	120.00	L-12
		Mazdoor for trimming slopes including manual loading in truck	day	10.000	250.00	2500.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator with rock breaker attachment @ 6 cum per hour	hour	6.000	1571.00	9426.00	P&M-026
		Tipper 5.5 cum capacity, 1 trip per hour.	hour	6.500	609.00	3958.50	P&M-048
		Credit for excavated rock found suitable for use @ 50 per cent of excavated quantity	cum	18.000	(231.00)	(4158.00)	M-089
		<b>c) Overhead charges @ 10 % on (a+b)</b>				1184.65	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1303.12	
		Cost for 36 cum = a+b+c+d				14334.27	
		<b>Rate per cum = (a+b+c+d)/36</b>				398.17	
					<i>say</i>	<b><u>398.00</u></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 restricted/reduced to that extent.					
		3. Being small quantity, manual loading will be economical in this case and has been provided accordingly.					
3.8	<b>B</b>	<b>Manual Method</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 16 cum</i>					
		<b>a) Labour</b>					
		Mate	day	1.640	300.00	492.00	L-12
		Mazdoor including loading in truck	day	16.000	250.00	4000.00	L-13
		Chiseller	day	24.000	300.00	7200.00	L-05
		Blacksmith	day	1.000	400.00	400.00	L-02
		<b>b) Machinery</b>					
		Tipper 5.5 cum capacity, 1 trip per hour.	hour	2.900	609.00	1766.10	P&M-048
		Credit for excavated rock found suitable for use @ 50 per cent of excavated	cum	8.000	(231.00)	(1848.00)	M-089
		<b>c) Overhead charges @ 10 % on (a+b)</b>				1201.01	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1321.11	
		Cost for 16 cum = a+b+c+d				14532.22	
		<b>Rate per cum = (a+b+c+d)/16</b>				908.26	
					<i>say</i>	<b><u>908.00</u></b>	
	<b>Note</b>	1. Credit is considered for 50 per cent of quantity of work.					
		2. Loading for disposal will be done manually, being small quantity.					
		3. In case some rock is issued to contractor at site, the item of carriage shall be omitted to the extent of quantity issued to the contractor.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.9	301	<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					
		<b>Unit = cum</b>					
		<b>Taking output = 180 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.220	300.00	66.00	L-12
		Mazdoor	day	3.000	250.00	750.00	L-13
		Driller	day	2.000	300.00	600.00	L-06
		Blaster	day	0.500	300.00	150.00	L-03
		<b>b) Machinery</b>					
		Dozer 80 HP @ 30 cum per hour	hour	6.000	3615.00	21690.00	P&M-014
		Air compressor, 250 cfm with 2 jack hammers	hour	6.000	516.00	3096.00	P&M-001
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	8.200	609.00	4993.80	P&M-048
		<b>c) Materials</b>					
		Gelatin 80 per cent	kg	63.000	148.00	9324.00	M-104
		Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each	each	1008.000	9.90	9979.20	M-094 /100
		Credit for excavated rock found suitable for use @ 50 per cent quantity blasted	cum	90.000	(231.00)	(20790.00)	M-089
		Add 5 per cent of cost of a+b+c towards muffling arrangements to guard against any rock fly off during blasting				2908.35	
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				4028.54	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				4431.39	
		Cost for 180 cum = a+b+c+d+e				48745.27	
		<b>Rate per cum = (a+b+c+d+e)/180</b>				270.81	
						<b>say</b>	<b>271.00</b>
		<b>Note</b>					
		1. Credit is considered for 50 per cent of quantity of blasted rock, if found suitable for construction..					
		2. In case some rock is issued to the contractor at site, the item of carriage shall be reduced to that extent.					
3.10	301	<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.					
		<b>Unit = cum</b>					
		<b>Taking output = 300 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	300.00	24.00	L-12
		Mazdoor	day	2.000	250.00	500.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator 0.90 cum bucket capacity @ 50 cum per hour	hour	6.000	1571.00	9426.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	13.640	609.00	8306.76	P&M-048
		<b>c) Overhead charges @ 10 % on (a+b)</b>				1825.68	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2008.24	
		Cost for 300 cum = a+b+c+d				22090.68	
		<b>Rate per cum = (a+b+c+d)/300</b>				73.64	
						<b>say</b>	<b>74.00</b>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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	300.00	24.00	L-12
		Mazdoor	day	2.000	250.00	500.00	L-13
		<b>b) Machinery</b>					
		Excavator 0.90 cum bucket capacity @ 60 cum per hour	hour	6.000	1571.00	9426.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	16.360	609.00	9963.24	P&M-048
		<b>c) Overhead charges @ 10 % on (a+b)</b>				1991.32	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2190.46	
		Cost for 360 cum = a+b+c+d				24095.02	
		<b>Rate per cum = (a+b+c+d)/360</b>				66.93	
						<b>say</b>	<b><u>67.00</u></b>
		<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.					
3.12	303	<b>Presplitting 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					
		<i>Unit = sqm</i>					
		<i>Taking output = 400 sqm( 120 cum considering 300mm average depth of excavation over the existing rock face)</i>					
		<b>a) Labour</b>					
		Mate	day	0.600	300.00	180.00	L-12
		Mazdoor	day	15.000	250.00	3750.00	L-13
		<b>b) Machinery</b>					
		Air compressor 250 cfm with 2 leads @ 20 cum per hour	hour	6.000	516.00	3096.00	P&M-001
		Dozer, 80 HP	hour	6.000	3615.00	21690.00	P&M-014
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		<b>c) Materials</b>					
		Gelatin 80 per cent	kg	42.000	148.00	6216.00	M-104
		Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each	each	672.000	9.90	6652.80	M-094 /100
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				4910.28	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				5401.31	
		Cost for 400 sqm = a+b+c+d+e				59414.39	
		<b>Rate per sqm = (a+b+c+d+e)/400</b>				148.54	
						<b>say</b>	<b><u>149.00</u></b>
		<b>Note</b> In case blasted rock is used to the contractor against payment for constructed work, the cost of carriage shall be reduced to that extent.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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>					
	A	<b>Manual Means (Depth upto 3 m)</b>					
		a) <b>Labour</b>					
		Mate	day	0.320	300.00	96.00	L-12
		Mazdoor	day	8.000	250.00	2000.00	L-13
		b) <b>Overhead charges @ 10 % on (a)</b>				209.60	
		c) <b>Contractor's profit @ 10 % on (a+b)</b>				230.56	
		Cost for 10 cum = a+b+c				2536.16	
		<b>Rate per cum = (a+b+c)/10</b>				253.62	
						<b>say</b>	<b><u>254.00</u></b>
	Note	Cost of dewatering may be added where required upto 10 per cent of labour cost Assessment for dewatering shall be made as per site conditions..					
3.13 (i)	B	<b>Mechanical Means (Depth upto 3 m)</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 300 cum</i>					
		a) <b>Labour</b>					
		Mate	day	0.320	300.00	96.00	L-12
		Mazdoor	day	8.000	250.00	2000.00	L-13
		b) <b>Machinery</b>					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.000	1571.00	9426.00	P&M-026
		c) <b>Overhead charges @ 10 % on (a+b)</b>				1152.20	
		d) <b>Contractor's profit @ 10 % on (a+b+c)</b>				1267.42	
		Cost for 300 cum = a+b+c+d				13941.62	
		<b>Rate per cum = (a+b+c+d)/300</b>				46.47	
						<b>say</b>	<b><u>46.00</u></b>
	Note	Cost of dewatering upto 5 per cent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions..					
3.13	(ii)	<b>Ordinary Rock (not requiring blasting)</b>					
	A	<b>Manual Means (Depth upto 3 m)</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
		a) <b>Labour</b>					
		Mate	day	0.400	300.00	120.00	L-12
		Mazdoor	day	10.000	250.00	2500.00	L-13
		b) <b>Overhead charges @ 10 % on (a)</b>				262.00	
		c) <b>Contractor's profit @ 10 % on (a+b)</b>				288.20	
		Cost for 10 cum = a+b+c				3170.20	
		<b>Rate per cum = (a+b+c)/10</b>				317.02	
						<b>say</b>	<b><u>317.00</u></b>
	Note	Cost of dewatering upto 10 per cent of labour cost may be added, where required. Assessment for dewatering shall be made as per site conditions..					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
3.13 (ii)		B	<b>Mechanical Means</b>						
			<i>Unit = cum</i>						
			<i>Taking output = 216 cum</i>						
			a) Labour						
			Mate	day	0.240	300.00	72.00	L-12	
			Mazdoor	day	6.000	250.00	1500.00	L-13	
			b) Machinery						
			Hydraulic excavator 1.0 cum bucket capacity	hour	6.000	1571.00	9426.00	P&M-026	
			c) Overhead charges @ 10 % on (a+b)				1099.80		
			d) Contractor's profit @ 10 % on (a+b+c)				1209.78		
			Cost for 216 cum = a+b+c+d				13307.58		
			Rate per cum = (a+b+c+d)/216				61.61		
							<b>say</b>	<b>62.00</b>	
		Note	1. Cost of dewatering upto 5 per cent of (a+b), may be added, where required Assessment for dewatering shall be made as per site conditions.						
			2. In case of rock, foundation beyond 3 m is not dug and hence not included.						
3.13		(iii)	<b>Hard Rock ( requiring blasting )</b>						
		A	<b>Manual Means</b>						
			<i>Unit = cum</i>						
			<i>Taking output = 10 cum</i>						
			a) Labour						
			i) Mate	day	0.530	300.00	159.00	L-12	
			ii) Driller	day	0.840	300.00	252.00	L-06	
			iii) Blaster	day	0.400	300.00	120.00	L-03	
			iv) Mazdoor	day	12.000	250.00	3000.00	L-13	
			b) Machinery						
			Air Compressor 250 cfm with 2 jack hammer @ 15 cum per hour	hour	0.667	516.00	344.00	P&M-001	
			c) Material						
			Blasting Material	kg	3.500	148.00	518.00	M-104	
			Detonator electric	each	14.000	9.90	138.60	M-094 /100	
			d) Overhead charges @ 10 % on (a+b+c)				453.16		
			e) Contractor's profit @ 10 % on (a+b+c+d)				498.48		
			Cost for 10 cum = a+b+c+d+e				5483.24		
			Rate per cum = (a+b+c+d+e)/10				548.32		
							<b>say</b>	<b>548.00</b>	
		Note	Cost of dewatering @ 10 per cent of labour cost may be added, where required Assessment for dewatering shall be made as per site conditions.						
3.13		(iv)	<b>Hard Rock ( blasting prohibited )</b>						
			<i>Unit = cum</i>						
			<i>Taking output = 10 cum</i>						
		A	<b>Mechanical Means</b>						
			a) Labour						
			Mate	day	0.200	300.00	60.00	L-12	
			Mazdoor	day	5.000	250.00	1250.00	L-13	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1 cum per hour	hour	10.000	516.00	5160.00	P&M-001
		<b>c) Overhead charges @ 10 % on (a+b)</b>				647.00	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				711.70	
		Cost for 10 cum = a+b+c+d				7828.70	
		<b>Rate per cum = (a+b+c+d)/10</b>				782.87	
					<b>say</b>	<b>783.00</b>	
		<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>					
		<b>Unit = cum</b>					
		<b>Taking output = 10 cum</b>					
		<b>A Manual means ( upto 3 m depth)</b>					
		<b>a) Labour</b>					
		Mate/Supervisor	day	0.400	300.00	120.00	L-12
		Mazdoor	day	10.000	250.00	2500.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	2.670	427.00	1140.09	P&M-053
		<b>c) Material</b>					
		Selected earth for refilling	cum	5.000	181.00	905.00	M-163
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				466.51	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				513.16	
		Cost for 10 cum = a+b+c+d+e				5644.76	
		<b>Rate per cum = ( a+b+c+d+e)/ 10</b>				564.48	
					<b>say</b>	<b>564.00</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	300.00	24.00	L-12
		ii) Mazdoor for dressing sides, bottom and backfilling	day	2.000	250.00	500.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.170	1571.00	267.07	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.450	609.00	274.05	P&M-048

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Material</b>					
		Selected earth for refilling	cum	5.000	181.00	905.00	M-163
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				197.01	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				216.71	
		Cost for 10 cum = a+b+c+d+e				2383.85	
		<b>Rate per cum = (a+b+c+d+e)/10</b>				238.38	
					say	<u>238.00</u>	
		<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	300.00	60.00	L-12
		Mazdoor including loading and unloading	day	5.000	250.00	1250.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	1.670	427.00	713.09	P&M-053
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				202.31	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				222.54	
		Cost for 100 sqm = a+b+c+d				2447.94	
		<b>Rate per sqm = (a+b+c+d)/100</b>				24.48	
					say	<u>24.00</u>	
		<b>Note</b>					
		In case material is to be reused at site, transportation cost catered above for disposal shall be deleted.					
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	300.00	3.00	L-12
		Mazdoor	day	0.250	250.00	62.50	L-13
		<b>b) Machinery</b>					
		Tractor with ripper attachment @ 60 cum per hour	hour	0.080	377.00	30.16	P&M-055
		Front end loader 1 cum bucket capacity @ 25 cum per hour	hour	0.200	1253.00	250.60	P&M-017
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.230	609.00	140.07	P&M-048
		<b>c) Overhead charges @ 10 % on (a+b)</b>				48.63	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				53.50	
		Cost for 100 sqm = a+b+c+d				588.46	
		<b>Rate per sqm = (a+b+c+d)/100</b>				5.88	
					say	<u>6.00</u>	
3.16	305	<b>Construction of Embankment with Material obtained from Borrowpits</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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	300.00	12.00	L-12
		Mazdoor	day	1.000	250.00	250.00	L-13
		<b>b) Machinery</b>					
		Hydraulic Excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1571.00	2623.57	P&M-026
		Tipper 10 tonne capacity	tonne.km	160 x L	24.00	11520.00	Lead =3 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				1152.00	
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	3615.00	1807.50	P&M-014
		Motor grader for grading @ 100 cum per hour	hour	1.000	2617.00	2617.00	P&M-032
		Water tanker 6 KL capacity	hour	4.000	488.00	1952.00	P&M-060
		Three wheel 80-100 kN Statis Roller	hour	1.000	658.00	658.00	P&M-059
		<b>c) Material</b>					
		Cost of water	KL	24.000	60.00	1440.00	M-189
		Compensation for earth taken from private land	cum	100.000	0.00	0.00	M-092
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				2403.21	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				2643.53	
		Cost for 100 cum = a+b+c+d+e				29078.80	
		<b>Rate per cum = (a+b+c+d+e)/100</b>				290.79	
					<b>say</b>	<b>291.00</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.					
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	300.00	6.00	L-12
		Mazdoor	day	0.500	250.00	125.00	L-13
		<b>b) Machinery</b>					
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	3615.00	1807.50	P&M-014
		Motor grader for grading @ 100 cum per hour	hour	1.000	2617.00	2617.00	P&M-032
		Water tanker 6 KL capacity	hour	4.000	488.00	1952.00	P&M-060
		Three wheel 80-100 kN Statis Roller	hour	1.000	658.00	658.00	P&M-059
		<b>c) Material</b>					
		Cost of water	KL	24.000	60.00	1440.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				860.55	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				946.61	
		Rate for 100 cum = a+b+c+d+e				10412.66	
		<b>Rate per cum = (a+b+c+d+e)/100</b>				104.13	
					<b>say</b>	<b>104.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<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.					
<b>3.18</b>	<b>305</b>		<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					
			<i>Unit = cum</i>					
			<i>Taking output = 100 cum</i>					
			<b>a) Labour</b>					
			Mate	day	0.040	300.00	12.00	L-12
			Mazdoor	day	1.000	250.00	250.00	L-13
			<b>b) Machinery</b>					
			Hydraulic excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1571.00	2623.57	P&M-026
			Tipper 10 tonne capacity	tonne.km	175xL	24.00	12600.00	Lead =3 km & P&M-058
			Add 10 per cent of cost of carriage to cover cost of loading and unloading				1260.00	
			Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	3615.00	1807.50	P&M-014
			Motor grader for grading @ 50 cum per hour	hour	2.000	2617.00	5234.00	P&M-032
			Water tanker with 6 km lead	hour	4.000	488.00	1952.00	P&M-060
			Three wheel 80-100 kN Statis Roller	hour	1.250	658.00	822.50	P&M-059
			<b>c) Material</b>					
			Cost of water	KL	24.000	60.00	1440.00	M-189
			Compensation for earth taken from private land	cum	100.000	0.00	0.00	M-092
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				2800.16	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				3080.17	
			Cost for 100 cum = a+b+c+d+e				33881.90	
			<b>Rate per cum = (a+b+c+d+e)/100</b>				338.82	
						<b>say</b>	<b>339.00</b>	
<b>3.19</b>	<b>305.3.4</b>		<b>Compacting Original Ground</b>					
		<b>Case-I</b>	<b>Compacting original ground supporting sub-grade</b>					
			Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers to meet requirement of table 300-2 for sub-grade construction.					
			<i>Unit = cum</i>					
			<i>Taking output = 600 cum</i>					
			<b>a) Labour</b>					
			Mate	day	0.120	300.00	36.00	L-12
			Mazdoor	day	3.000	250.00	750.00	L-13
			<b>b) Machinery</b>					
			Tractor with ripper attachment	hour	9.000	377.00	3393.00	P&M-055
			Motor grader for grading	hour	6.000	2617.00	15702.00	P&M-032
			Water tanker 6 KL capacity	hour	4.000	488.00	1952.00	P&M-060
			Three wheel 80-100 kN Statis Roller	hour	7.500	658.00	4935.00	P&M-059

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Material</b>					
		Cost of water	KL	24.000	60.00	1440.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				2820.80	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				3102.88	
		Cost for 600 cum = a+b+c+d+e				34131.68	
		<b>Rate per cum = (a+b+c+d+e)/600</b>				56.89	
					<b>say</b>	<b>57.00</b>	
3.19	Case-II	<b>:Compacting original ground supporting embankment</b>					
		Loosening, leveling and Compacting original ground supporting embankment to facilitate placement of first layer of embankment, scarified to a depth of 150 mm, mixed with water at OMC and then compacted by rolling so as to achieve minimum dry density as given in Table 300-2 for embankment construction.					
		<b>Unit = cum</b>					
		<b>Taking output = 600 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	300.00	24.00	L-12
		Mazdoor	day	2.000	250.00	500.00	L-13
		<b>b) Machinery</b>					
		Tractor with ripper attachment	hour	6.000	377.00	2262.00	P&M-055
		Three wheel 80-100 kN Statis Roller	hour	7.500	658.00	4935.00	P&M-059
		Water tanker 6 KL capacity	hour	4.000	488.00	1952.00	P&M-060
		<b>c) Material</b>					
		Cost of water	KL	24.000	60.00	1440.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				1111.30	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				1222.43	
		Cost for 600 cum = (a+b+c+d+e)				13446.73	
		<b>Rate per sqm = (a+b+c+d+e)/600</b>				22.41	
					<b>say</b>	<b>22.00</b>	
3.20	305	<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.					
		<b>Unit = cum</b>					
		<b>Taking output = 10 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.200	300.00	60.00	L-12
		Mazdoor	day	5.000	250.00	1250.00	L-13
		<b>b) Machinery</b>					
		Dozer 80 HP @ 100 cum per hour	hour	0.100	3615.00	361.50	P&M-014
		<b>c) Overhead charges @ 10 % on (a+b)</b>				167.15	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				183.87	
		Cost for 10 cum = (a+b+c+d)				2022.52	
		<b>Rate per cum = (a+b+c+d)/10</b>				202.25	
					<b>say</b>	<b>202.00</b>	
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.					
		<b>Unit = cum</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Taking output = 300 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	300.00	24.00	L-12
		Mazdoor	day	2.000	250.00	500.00	L-13
		<b>b) Machinery</b>					
		Dozer, 80 HP	hour	6.000	3615.00	21690.00	P&M-014
		<b>c) Overhead charges @ 10 % on (a+b)</b>				2221.40	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2443.54	
		Cost for 300 cum = (a+b+c+d)				26878.94	
		<b>Rate per cum = (a+b+c+d)/300</b>				89.60	
					<b>say</b>	<b>90.00</b>	
<b>3.22</b>	<b>307</b>	<b>Turfing with Sods</b>					
		Furnishing and laying of the live sods of perennial turf forming grass on embankment slope, verges or other locations shown on the drawing or as directed by the engineer including preparation of ground, fetching of sods and watering.					
		<b>Unit = sqm</b>					
		<b>Taking output = 100 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	300.00	36.00	L-12
		Mazdoor for preparation of ground and fetching of sods	day	3.000	250.00	750.00	L-13
		<b>b) Machinery</b>					
		Water tanker including watering for 3 months	hour	2.000	488.00	976.00	P&M-060
		Tractor-trolley	hour	1.000	427.00	427.00	P&M-053
		<b>c) Material</b>					
		Farm yard manure @ 0.18 cum per 100 sqm at site of work	cum	0.180	121.00	21.78	M-167
		Cost of water	KL	12.000	60.00	720.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				293.08	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				322.39	
		Cost for 100 sqm = a+b+c+d+e				3546.24	
		<b>Rate per 100 sqm = (a+b+c+d+e)/100</b>				35.46	
					<b>say</b>	<b>35.00</b>	
<b>3.23</b>	<b>308</b>	<b>Seeding and Mulching</b>					
		Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, mulching material, applying bituminous emulsion at the rate of 0.23 litres per sqm and laying and fixing jute netting, including watering for 3 months all as per clause 308.					
		<b>Unit = sqm</b>					
		<b>Taking output = 240 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.400	300.00	120.00	L-12
		Mazdoor	day	10.000	250.00	2500.00	L-13
		<b>b) Machinery</b>					
		Water tanker 6 KL capacity including watering for 3 months	hour	14.000	488.00	6832.00	P&M-060
		Tractor-trolley	hour	2.400	427.00	1024.80	P&M-053
		<b>c) Material</b>					
		Seeds	kg	3.600	302.00	1087.20	M-162
		Sludge/Farm yard manure @ 0.18 cum per 100 sqm	cum	0.430	121.00	52.03	M-167
		Bitumen Emulsion	litre	55.200	39.59	2185.15	M-077
		Jute netting, open weave, 2.5 cm square opening	sqm	264.000	13.00	3432.00	M-121
		Cost of water for 3 months	KL	84.000	60.00	5040.00	M-189

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 10 % on (a+b+c)				2227.32	
		e) Contractor's profit @ 10 % on (a+b+c+d)				2450.05	
		Cost for 240 sqm = a+b+c+d+e				26950.54	
		Rate per sqm = (a+b+c+d+e)/240				112.29	
					say	<u>112.00</u>	
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	300.00	3.00	L-12
		Mazdoor for dressing of bed and side of drain	day	0.250	250.00	62.50	L-13
		<b>b) Machinery</b>					
		Hydraulic Excavator 0.3 cum bucket capacity @ 30 metres per hour	hour	0.330	1571.00	518.43	P&M-026
		c) Overhead charges @ 10 % on (a+b)				58.39	
		d) Contractor's profit @ 10 % on (a+b+c)				64.23	
		Cost for 10 metres = a+b+c+d				706.56	
		Rate per metre = (a+b+c+d)/10				70.66	
					say	<u>71.00</u>	
3.24		<b>B Manual Means</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	300.00	24.00	L-12
		Mazdoor	day	2.000	250.00	500.00	L-13
		b) Overhead charges @ 10 % on (a)				52.40	
		c) Contractor's profit @ 10 % on (a+b)				57.64	
		Cost for 10 metres = a+b+c				634.04	
		Rate per metre = (a+b+c)/10				63.40	
					say	<u>63.00</u>	
		<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.					
3.25	309	<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.					
		<i>Unit = metre</i>					
		<i>Taking output = 10 metres</i>					
		<b>A Mechanical Means</b>					
		<b>a) Labour</b>					
		Mate	day	0.020	300.00	6.00	L-12
		Mazdoor for dressing of bed and side of drain	day	0.500	250.00	125.00	L-13
		<b>b) Machinery</b>					
		Hydraulic Excavator 0.3 cum bucket capacity @ 15 metres per hour	hour	0.670	1571.00	1052.57	P&M-026
		c) Overhead charges @ 10 % on (a+b)				118.36	
		d) Contractor's profit @ 10 % on (a+b+c)				130.19	
		Cost for 10 metres = a+b+c+d				1432.12	
		Rate per metre = (a+b+c+d)/10				143.21	
					say	<u>143.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.25		B	<b>Manual Means</b>					
			a) <b>Labour</b>					
			Mate	day	0.120	300.00	36.00	L-12
			Mazdoor	day	3.000	250.00	750.00	L-13
			b) <b>Overhead charges @ 10 % on (a)</b>				78.60	
			c) <b>Contractor's profit @ 10 % on (a+b)</b>				86.46	
			Cost for 10 metres = a+b+c				951.06	
			<b>Rate per metre = (a+b+c)/10</b>				95.11	
						<b>say</b>	<b>95.00</b>	
3.26	309		<b>Surface Drains in Hard Rock</b>					
			Rate per metre may be worked out based on quantity of hard rock as per design.					
			For rate of hard rock cutting, refer relevant item in this chapter					
3.27	309		<b>Sub-Surface Drains with Perforated Pipe</b>					
			Construction of subsurface drain with perforated pipe of 100 mm internal diameter of metal/ asbestos cement/ cement concrete/PVC, closely jointed, perforations ranging from 3 mm to 6 mm depending upon size of material surrounding the pipe, with 150 mm bedding below the pipe and 300 mm cushion above the pipe, cross section of excavation 450 x 550 mm. Excavated material to be utilised in roadway at site.					
			<b>Unit = metre</b>					
			<b>Taking output = 10 metres</b>					
			a) <b>Labour</b>					
			Mate	day	0.040	300.00	12.00	L-12
			Mazdoor for excavation and back filling	day	2.000	250.00	500.00	L-13
			c) <b>Material</b>					
			Perforated pipe of cement concrete, internal dia 100 mm	metre	10.000	85.00	850.00	M-135
			Crushed stone as per table 300-3	cum	2.400	1150.00	2760.00	M-012
			d) <b>Overhead charges @ 10 % on (a+b+c)</b>				412.20	
			e) <b>Contractor's profit @ 10 % on (a+b+c+d)</b>				453.42	
			Cost for 10 metres = a+b+c+d+e				4987.62	
			<b>Rate per metre = (a+b+c+d+e)/10</b>				498.76	
						<b>say</b>	<b>499.00</b>	
		Note	Type of pipe may be modified depending upon provision in design.					
3.28	309		<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.					
			<b>Unit = metre</b>					
			<b>Taking output = 10 metres</b>					
			a) <b>Labour</b>					
			Mate	day	0.020	300.00	6.00	L-12
			Mazdoor for excavation and back filling with aggregates	day	1.500	250.00	375.00	L-13
			b) <b>Material</b>					
			Crushed stone as per table 300-3	cum	1.350	1150.00	1552.50	M-012
			c) <b>Overhead charges @ 10 % on (a+b)</b>				193.35	
			d) <b>Contractor's profit @ 10 % on (a+b+c)</b>				212.69	
			Cost for 10 metres = a+b+c+d				2339.54	
			<b>Rate per metre = (a+b+c+d)/10</b>				233.95	
						<b>say</b>	<b>234.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.29	309	<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.					
		<b>Unit = Running metre</b>					
		<b>Taking output = one metre</b>					
		a) Earthwork in soil	cum	1.500	46.00	69.00	Item No. 3.13
		b) RCC work M-20	cum	0.495	6822.00	3376.89	Item 12.8 (C) RCC
		<b>Rate per metre = (a+b)</b>				3445.89	
		Rates for these items may be taken from chapters on earth work and substructures respectively.			say	<u>3446.00</u>	
3.30	310	<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.					
		<b>Unit = sqm</b>					
		<b>Taking output = 3500sqm</b>					
		a) Labour					
		Mate	day	0.280	300.00	84.00	L-12
		Mazdoor	day	6.000	250.00	1500.00	L-13
		Mazdoor skilled	day	1.000	400.00	400.00	L-15
		b) Machinery					
		Smooth 3 wheeled steel roller 8-10 tonnes	hour	3.000	504.00	1512.00	P&M-044
		Water tanker 6 KL, one trip per hour	hour	3.000	488.00	1464.00	P&M-060
		c) Material					
		Cost of water	KL	18.000	60.00	1080.00	M-189
		d) Overhead charges @ 10 % on (a+b+c)				604.00	
		e) Contractor's profit @ 10 % on (a+b+c+d)				664.40	
		Cost for 3500 sqm = a+b+c+d+e				7308.40	
		<b>Rate per sqm = (a+b+c+d+e)/3500</b>				2.09	
					say	<u>2.00</u>	
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.					
		<b>Unit = cum</b>					
		<b>Taking output = 100 cum</b>					
		a) Labour					
		Mate	day	0.040	300.00	12.00	L-12
		Mazdoor	day	1.500	250.00	375.00	L-13
		b) Machinery					
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	3615.00	1807.50	P&M-014
		Three wheel 80-100 kN Statis Roller	hour	1.000	658.00	658.00	P&M-059
		Water tanker 6 KL, one trip per hour	hour	2.000	488.00	976.00	P&M-060
		c) Material					
		Cost of water	KL	12.000	60.00	720.00	M-189
		d) Overhead charges @ 10 % on (a+b+c)				454.85	
		e) Contractor's profit @ 10 % on (a+b+c+d)				500.34	
		Cost for 100 cum = a+b+c+d+e				5503.69	
		<b>Rate per cum = (a+b+c+d+e)/100</b>				55.04	
					say	<u>55.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<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.					
			<b>EARTH WORK ON HILL ROAD</b>					
3.32	301	(i)	<b>Excavation in Hill Area in Soil by Mechanical Means (Dipositing of excavated earth with all lifts and lead upto 1000 m</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.					
			<i>Unit = cum</i>					
			<i>Taking output = 260 cum</i>					
			<b>a) Labour</b>					
			Mate	day	0.240	300.00	72.00	L-12
			Mazdoor for trimming slopes and helping in excavation etc.	day	6.000	250.00	1500.00	L-13
			<b>b) Machinery</b>					
			Dozer D-50 @ 43.28 cum per hour	hour	6.000	2632.00	15792.00	P&M-014
			Front end loader	hour	6.000	1253.00	7518.00	P&M-017
			Tipper 5.5cum capacity, 4 trips per hour.	hour	12.000	609.00	7308.00	P&M-048
			<b>c) Overhead charges @ 10 % on (a+b)</b>				3219.00	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				3540.90	
			Cost for 260 cum = a+b+c+d				38949.90	
			<b>Rate per cum = (a+b+c+d)/260</b>				149.81	
						<b>say</b>	<b><u>150.00</u></b>	
		(ii)	<b>Depositing of excavated earth on the barren valley side.</b>					
			Excavation in soil in hilly area by mechanical means including cutting and trimming of side slopes and disposing of excavated earth on the Barren Valley side.					
			<i>Unit = cum</i>					
			<i>Taking output = 260 cum</i>					
			<b>a) Labour</b>					
			Mate	day	0.240	300.00	72.00	L-12
			Mazdoor for trimming slopes and helping in excavation etc.	day	6.000	250.00	1500.00	L-13
			<b>b) Machinery</b>					
			Dozer D-50 @ 43.28 cum per hour	hour	6.000	2632.00	15792.00	P&M-014
			<b>c) Overhead charges @ 10 % on (a+b)</b>				1736.40	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1910.04	
			Cost for 260 cum = a+b+c+d				21010.44	
			<b>Rate per cum = (a+b+c+d)/260</b>				80.81	
						<b>say</b>	<b><u>81.00</u></b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.33	301	(i)	<b>Excavation in Hilly Area in Ordinary Rock by Mechanical Means not Requiring Blasting (Disposal of cut material with all lift and lead upto 1000 m)</b>					
			Excavation in hilly area in ordinary rock not requiring blasting by mechanical means including cutting and trimming of slopes and disposal of cut material with all lift and lead upto 1000 metres.					
			<b>Unit = cum</b>					
			<b>Taking output = 170 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.320	300.00	96.00	L-12
			Mazdoor	day	8.000	250.00	2000.00	L-13
			<b>b) Machinery</b>					
			Dozer D-50 @ 28.32 cum per hour	hour	6.000	2632.00	15792.00	P&M-014
			Front end loader	hour	7.000	1253.00	8771.00	P&M-017
			Tipper 5.5cum capacity, 4 trips per hour.	hour	7.000	609.00	4263.00	P&M-048
			<b>c) Overhead charges @ 10 % on (a+b)</b>				3092.20	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				3401.42	
			Cost for 170 cum = a+b+c+d				37415.62	
			<b>Rate per cum = (a+b+c+d)/170</b>				220.09	
							<b>say</b>	<b>220.00</b>
		(ii)	<b>Disposal of excavated earth on the barren valley side.</b>					
			Excavation in hilly area in ordinary rock not requiring blasting by mechanical means including cutting and trimming of slopes and disposal of excavated earth on the barren valley side.					
			<b>Unit = cum</b>					
			<b>Taking output = 170 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.320	300.00	96.00	L-12
			Mazdoor	day	8.000	250.00	2000.00	L-13
			<b>b) Machinery</b>					
			Dozer D-50 @ 28.32 cum per hour	hour	6.000	2632.00	15792.00	P&M-014
			<b>c) Overhead charges @ 10 % on (a+b)</b>				1788.80	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1967.68	
			Cost for 170 cum = a+b+c+d				21644.48	
			<b>Rate per cum = (a+b+c+d)/170</b>				127.32	
							<b>say</b>	<b>127.00</b>
3.34	301	(i)	<b>Excavation in Hilly Areas in Hard Rock Requiring Blasting (Disposal of cut material with all lift and lead upto 1000 m).</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.					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			<i>Unit = cum</i>					
			<i>Taking output = 170 cum</i>					
			<b>a) Labour</b>					
			Mate	day	0.490	300.00	147.00	L-12
			Mazdoor	day	10.000	250.00	2500.00	L-13
			Driller	day	2.000	300.00	600.00	L-06
			Blaster	day	0.250	300.00	75.00	L-03
			<b>b) Machinery</b>					
			Dozer D-50 @ 28.32 cum per hour	hour	6.000	2632.00	15792.00	P&M-014
			Air compressor 250 cfm with two jack hammer @ 20 cum per hour	hour	5.000	516.00	2580.00	P&M-001
			Front end loader	hour	7.000	1253.00	8771.00	P&M-017
			Tipper 5.5cum capacity, 4 trips per hour.	hour	7.000	609.00	4263.00	P&M-048
			<b>c) Materials</b>					
			Gelatine 80 per cent	kg	35.000	148.00	5180.00	M-104
			Electric Detonators @ 1 Detonator for 2 Gelatine sticks of 125 gms each	each	140.000	9.90	1386.00	M-094 /100
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				4129.40	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				4542.34	
			Cost for 170 cum = a+b+c+d+e				49965.74	
			<b>Rate per cum = (a+b+c+d+e)/170</b>				293.92	
							<b>say</b>	<b>294.00</b>
		(ii)	<b>Disposal of excavated earth on the barren valley side.</b>					
			Excavation in hilly areas in hard rock requiring blasting, by mechanical means including trimming of slopes and disposal of excavated earth on the barren valley side.					
			<i>Unit = cum</i>					
			<i>Taking output = 170 cum</i>					
			<b>a) Labour</b>					
			Mate	day	0.490	300.00	147.00	L-12
			Mazdoor	day	10.000	250.00	2500.00	L-13
			Driller	day	2.000	300.00	600.00	L-06
			Blaster	day	0.250	300.00	75.00	L-03
			<b>b) Machinery</b>					
			Dozer D-50 @ 28.32 cum per hour	hour	6.000	2632.00	15792.00	P&M-014
			Air compressor 250 cfm with two jack hammer @ 20 cum per hour	hour	5.000	516.00	2580.00	P&M-001
			<b>c) Materials</b>					
			Gelatine 80 per cent	kg	35.000	148.00	5180.00	M-104
			Electric Detonators @ 1 Detonator for 2 Gelatine sticks of 125 gms each	each	140.000	9.90	1386.00	M-094 /100
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				2826.00	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				3108.60	
			Cost for 170 cum = a+b+c+d+e				34194.60	
			<b>Rate per cum = (a+b+c+d+e)/170</b>				201.14	
							<b>say</b>	<b>201.00</b>
3.35	1600 & 300	(i)	<b>Excavation in Hilly Areas in Soil by Manual Means</b>					
		(A)	Excavation in soil in Hilly Area by Manual Means including cutting and trimming of side slopes and disposing of excavated earth with a lift upto 1.5 m and a lead upto 20 m as per drawing and Technical Specification Clause 1603.1					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = Cum</b>					
		<b>Taking output = 120 cum.</b>					
		<b>a) Labour</b>					
		Mate	day	2.400	300.00	720.00	L-12
		Mazdoor (Unskilled)	day	60.000	250.00	15000.00	L-13
		<b>b) Overhead charges @ 10 % on (a)</b>				1572.00	
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				1729.20	
		Cost for 120 cum = a+b+c				19021.20	
		<b>Rate per cum = (a+b+c)/120</b>				158.51	
					<b>say</b>	<b>159.00</b>	
		<b>(B)</b> Deduct for quantum of earthwork of all types disposal directly by throwing into the valley without involving any lead and lift.					
		Ordinary and Hard Soil/Hard Shale, Soil containing shingle or small size boulders.					
		<b>Unit = Cum</b>					
		<b>Taking output = 1 cum.</b>					
		<b>a) Labour</b>					
		Mazdoor (Unskilled)	day	0.199	250.00	49.75	L-13
		<b>b) Overhead charges @ 10 % on (a)</b>				4.98	
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				5.47	
		Cost for 1 cum = a+b+c				60.20	
		<b>Rate per cum = (a+b+c)/1</b>				60.20	
					<b>say</b>	<b>60.00</b>	
		<b>(ii) Excavation in Hilly Area in Ordinary Rock by Manual Means</b>					
		<b>(A)</b> Excavation in Ordinary Rock using Manual Means including loading in a truck and carrying of excavated material to embankment site with a lift upto 1.5 m and lead upto 20 m as per Clause 1603.2.					
		<b>Unit = Cum</b>					
		<b>Taking output = 120 cum.</b>					
		<b>a) Labour</b>					
		Mate	day	5.280	300.00	1584.00	L-12
		Mazdoor (Unskilled)	day	132.000	250.00	33000.00	L-13
		<b>b) Overhead charges @ 10 % on (a)</b>				3458.40	
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				3804.24	
		Cost for 120 cum = a+b+c				41846.64	
		<b>Rate per cum = (a+b+c)/120</b>				348.72	
					<b>say</b>	<b>349.00</b>	
		<b>(B)</b> Deduct for quantum of earthwork of all types disposal directly by throwing into the valley without involving any lead and lift.					
		Ordinary and Hard Rock					
		<b>Unit = Cum</b>					
		<b>Taking output = 1 cum.</b>					
		<b>a) Labour</b>					
		Mazdoor (Unskilled)	day	0.319	250.00	79.75	L-13
		<b>b) Overhead charges @ 10 % on (a)</b>				7.98	
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				8.77	
		Cost for 1 cum = a+b+c				96.50	
		<b>Rate per cum = (a+b+c)/1</b>				96.50	
					<b>say</b>	<b>96.00</b>	

## Chapter – 4

### SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS

#### Preamble:

- 1 Quantities of materials provided are approximate and are meant for the purpose of estimating only. Actual quantities shall be as per mix design.
- 2 For construction of sub-base, two alternatives as under have been provided.
  - a. Mix in place method
  - b. Plant mix method
- 3 Construction of shoulders: - Earthen, Hard and Paved shoulders have been considered, the rates applicable are for subgrade, sub-base and different layers of pavement respectively.
- 4 In the case of improvement of subgrade with lime stabilization, soil is assumed to be available at the site and has not been provided for. Only lime has been catered. In the case of lime stabilization of sub-base, soil has been provided to form the sub-base.
- 5 While providing for the rate of materials, detailed local enquires should be made and prevailing market rates ascertained from concerned suppliers in the area keeping in view the location of crushing plants and lead involved.
- 6 The quantities considered in the output are the compacted quantities. The quantities of aggregates provided in the rate analysis under the head material are the uncompacted quantities.

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		<b>Granular Sub-Base with Close Graded Material (Table:- 400-1)</b>					
		<b>A</b>	<b>Plant Mix Method</b>					
			Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401					
			<b>Unit = cum</b>					
			<b>Taking output = 225 cum (450 tonne)</b>					
			<b>a) Labour</b>					
			Mate	day	0.400	300.00	120.00	L-12
			Mazdoor skilled	day	2.000	400.00	800.00	L-15
			Mazdoor	day	8.000	250.00	2000.00	L-13
			<b>b) Machinery</b>					
			Wet mix plant @ 75 tonne capacity per hour	hour	6.000	1815.00	10890.00	P&M-093
			Electric generator 125 KVA	hour	6.000	787.00	4722.00	P&M-018
			Water tanker 6 KL capacity 5 km lead with one trip per hour	hour	4.500	488.00	2196.00	P&M-060
			Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
			Tipper 10 tonne	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
			Add 10 per cent of cost of carriage to cover loading and unloading				0.00	
			Motor Grader 110 HP	hour	6.000	2617.00	15702.00	P&M-032
			Vibratory roller 8-10 t	hour	6.000	658.00	3948.00	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	800.00	115200.00	M-013
			9.5 mm to 2.36 mm @ 20 per cent (graded)	cum	57.000	680.00	38760.00	M-017
			2.36 mm below @ 30 per cent	cum	86.400	540.00	46656.00	M-020
			Cost of water	KL	27.000	60.00	1620.00	M-189
			<b>OR</b>					
			<b>For Grading-II Material</b>					
			26.5 mm to 9.5 mm @ 35 per cent	cum	100.800	650.00	65520.00	M-015
			9.5 mm to 2.36 mm @ 25 per cent (graded)	cum	72.000	680.00	48960.00	M-017
			2.36 mm below @ 40 per cent	cum	115.200	540.00	62208.00	M-020
			Cost of water	KL	27.000	60.00	1620.00	M-189
			<b>OR</b>					
			<b>For Grading-III Material</b>					
			9.5 mm to 4.75 mm @ 35 per cent	cum	100.800	700.00	70560.00	M-016
			4.75 mm to 2.36 mm @ 12.5 per cent	cum	36.000	600.00	21600.00	M-018
			2.36 mm below @ 52.5 per cent	cum	151.200	540.00	81648.00	M-020
			Cost of water	KL	27.000	60.00	1620.00	M-189
4.1A	(i)		<b>Rate per cum for grading-I Material</b>					
			d) Overhead charges @ 10 % on (a+b+c)				25013.20	
			e) Contractor's profit @ 10 % on (a+b+c+d)				27514.52	
			Cost for 225 cum = a+b+c+d+e				302659.72	
			Rate per cum = (a+b+c+d+e)/225				1345.15	
							<b>say</b>	<b>1345.00</b>
4.1A	(ii)		<b>Rate per cum for grading-II Material</b>					
			d) Overhead charges @ 10 % on (a+b+c)				22620.40	
			e) Contractor's profit @ 10 % on (a+b+c+d)				24882.44	
			Cost for 225 cum = a+b+c+d+e				273706.84	
			Rate per cum = (a+b+c+d+e)/225				1216.47	
							<b>say</b>	<b>1216.00</b>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.1A	(iii)	Rate per cum for grading-III Material					
		d) Overhead charges @ 10 % on (a+b+c)				22332.40	
		e) Contractor's profit @ 10 % on (a+b+c+d)				24565.64	
		Cost for 225 cum = a+b+c+d+e				270222.04	
		Rate per cum = (a+b+c+d+e)/225				1200.99	
					say	<u>1201.00</u>	
	Note	Any one of the grading for material may be adopted as per design					
4.1	B	By Mix in Place Method					
		Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401					
		Unit = cum					
		Taking output = 300 cum					
		a) Labour					
		Mate	day	0.480	300.00	144.00	L-12
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		Mazdoor unskilled	day	10.000	250.00	2500.00	L-13
		b) Machinery					
		Motor Grader 110 HP @ 50 cum	hour	6.000	2617.00	15702.00	P&M-032
		Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
		Tractor - Rotavator	hour	12.000	366.00	4392.00	P&M-054
		Water tanker 6 KL capacity	hour	3.000	488.00	1464.00	P&M-060
		c) Material					
		Close graded Granular sub-base Material as per table 400-1					
		For Grading-I Material					
		53 mm to 9.5 mm @ 50 per cent	cum	192.000	800.00	153600.00	M-013
		9.5 mm to 2.36 mm @ 20 per cent	cum	76.000	680.00	51680.00	M-017
		2.36 mm below @ 30 per cent	cum	115.200	540.00	62208.00	M-020
		Cost of water	KL	18.000	60.00	1080.00	M-189
		OR					
		For Grading-II Material					
		26.5 mm to 9.5 mm @ 35 per cent	cum	134.400	650.00	87360.00	M-015
		9.5 mm to 2.36 mm @ 25 per cent	cum	96.000	680.00	65280.00	M-017
		2.36 mm below @ 40 per cent	cum	153.600	540.00	82944.00	M-020
		Cost of water	KL	18.000	60.00	1080.00	M-189
		OR					
		For Grading-III Material					
		9.5 mm to 4.75 mm @ 35 per cent	cum	134.400	700.00	94080.00	M-016
		4.75 mm to 2.36 mm @ 12.5 per cent	cum	48.000	600.00	28800.00	M-018
		2.36 mm below @ 52.5 per cent	cum	201.600	540.00	108864.00	M-020
		Cost of water	KL	18.000	60.00	1080.00	M-189
4.1B	(i)	Rate per cum for grading-I Material					
		d) Overhead charges @ 10 % on (a+b+c)				29751.80	
		e) Contractor's profit @ 10 % on (a+b+c+d)				32726.98	
		Cost for 300 cum = a+b+c+d+e				359996.78	
		Rate per cum = (a+b+c+d+e)/300				1199.99	
					say	<u>1200.00</u>	
4.1B	(ii)	Rate per cum for grading-II Material					
		d) Overhead charges @ 10 % on (a+b+c)				26561.40	
		e) Contractor's profit @ 10 % on (a+b+c+d)				29217.54	
		Cost for 300 cum = a+b+c+d+e				321392.94	
		Rate per cum = (a+b+c+d+e)/300				1071.31	
					say	<u>1071.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.1B		(iii)	Rate per cum for grading-III Material					
			d) Overhead charges @ 10 % on (a+b+c)				26177.40	
			e) Contractor's profit @ 10 % on (a+b+c+d)				28795.14	
			Cost for 300 cum = a+b+c+d+e				316746.54	
			Rate per cum = (a+b+c+d+e)/300				1055.82	
						say	<u>1056.00</u>	
		Note	Any one of the grading for material may be adopted as per design					
4.2	401		Granular Sub-Base with Coarse Graded Material (Table:-400-2)					
			Construction of granular sub-base by providing coarse graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401.					
			<b>Unit = cum</b>					
			<b>Taking output = 300 cum</b>					
			a) Labour					
			Mate	day	0.400	300.00	120.00	L-12
			Mazdoor skilled	day	2.000	400.00	800.00	L-15
			Mazdoor	day	8.000	250.00	2000.00	L-13
			b) Machinery					
			Mortar Grader 110 HP @ 50 cum per hour	hour	6.000	2617.00	15702.00	P&M-032
			Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
			Water tanker 6 KL capacity	hour	3.000	488.00	1464.00	P&M-060
			c) Material					
			For coarse graded Granular sub-base Materials per table 400-2					
			For grading-I Material					
			53 mm to 26.5 mm @ 35 per cent	cum	134.400	850.00	114240.00	M-029
			26.5 mm to 4.75 mm @ 45 per cent	cum	172.800	700.00	120960.00	M-026
			2.36 mm below @ 20 per cent (Coarse Sand)	cum	76.800	560.00	43008.00	M-022
			Cost of water	KL	18.000	60.00	1080.00	M-189
			OR					
			For Grading-II Material					
			26.5 mm to 4.75 mm @ 75 per cent	cum	288.000	700.00	201600.00	M-026
			2.36 mm below @ 25 per cent	cum	96.000	560.00	53760.00	M-022
			Cost of water	KL	18.000	60.00	1080.00	M-189
			OR					
			For Grading-III Material					
			9.5 mm to 4.75 mm @ 66 per cent	cum	255.000	650.00	165750.00	M-025
			2.36 mm below @ 34 per cent	cum	129.000	560.00	72240.00	M-022
			Cost of water	KL	18.000	60.00	1080.00	M-189
4.2		(i)	Rate per cum for grading-I Material					
			d) Overhead charges @ 10 % on (a+b+c)				30332.20	
			e) Contractor's profit @ 10 % on (a+b+c+d)				33365.42	
			Cost for 300 cum = a+b+c+d+e				367019.62	
			Rate per cum = (a+b+c+d+e)/300				1223.40	
						say	<u>1223.00</u>	
4.2		(ii)	Rate per cum for grading-II Material					
			d) Overhead charges @ 10 % on (a+b+c)				28047.40	
			e) Contractor's profit @ 10 % on (a+b+c+d)				30852.14	
			Cost for 300 cum = a+b+c+d+e				339373.54	
			Rate per cum = (a+b+c+d+e)/300				1131.25	
						say	<u>1131.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.2		(iii)	<b>Rate per cum for grading-III Material</b>					
			d) Overhead charges @ 10 % on (a+b+c)				26310.40	
			e) Contractor's profit @ 10 % on (a+b+c+d)				28941.44	
			Cost for 300 cum = a+b+c+d+e				318355.84	
			<b>Rate per cum = (a+b+c+d+e)/300</b>				1061.19	
							<b>say</b>	<b>1061.00</b>
		<b>Note</b>	Any one of the grading for material may be adopted as per design					
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 tonnes)</b>					
		<b>A</b>	<b>By Mechanical Means</b>					
			a) Labour					
			Mate	day	0.360	300.00	108.00	L-12
			Skilled mazdoor for alignment and geometrics	day	1.000	400.00	400.00	L-15
			Mazdoor for spraying lime	day	8.000	250.00	2000.00	L-13
			b) Machinery					
			Tractor with ripper and rotavator attachments @ 60 cum per hour for ripping and 25 cum per hour for mixing	hour	12.000	377.00	4524.00	P&M-055
			Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2617.00	15702.00	P&M-032
			Three wheel 80-100 kN Statis Roller	hour	6.00x0.65*	658.00	2566.20	P&M-059
			Water tanker 6 KL capacity	hour	12.000	488.00	5856.00	P&M-060
			c) Material					
			Lime at site	tonne	15.750	11550.00	181912.50	M-188
			Cost of water	KL	72.000	60.00	4320.00	M-189
			d) Overhead charges @ 10 % on (a+b+c)				21738.87	
			e) Contractor's profit @ 10 % on (a+b+c+d)				23912.76	
			Cost for 300 cum= a+b+c+d+e				263040.33	
			<b>Rate per cum =( a+b+c+d+e)/300</b>				876.80	
							<b>say</b>	<b>877.00</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</b>	<b>By Manual Means</b>					
			<b>Unit = cum</b>					
			<b>Taking output = 150 cum (263 tonnes)</b>					
			a) Labour					
			Mate	day	1.440	300.00	432.00	L-12
			Mazdoor skilled	day	1.000	400.00	400.00	L-15
			Mazdoor	day	35.000	250.00	8750.00	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Three wheel 80-100 kN Statis Roller	hour	2.500	658.00	1645.00	P&M-059
		Water tanker 6 KL capacity	hour	6.000	488.00	2928.00	P&M-060
		<b>c) Material</b>					
		Lime at site	tonne	8.000	11550.00	92400.00	M-188
		Cost of water	KL	36.000	60.00	2160.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				10871.50	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				11958.65	
		Cost for 150 cum= a+b+c+d+e				131545.15	
		<b>Rate per cum = (a+b+c+d+e)/150</b>				876.97	
					<b>say</b>	<b><u>877.00</u></b>	
<b>4.4</b>	<b>402</b>	<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>					
		<b>a) Labour</b>					
		Mate	day	0.480	300.00	144.00	L-12
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		Mazdoor	day	10.000	250.00	2500.00	L-13
		<b>b) Machinery</b>					
		Excavator 0.90 cum bucket capacity	hour	6.000	1571.00	9426.00	P&M-026
		Tipper for carriage of soil	tonne.km	525 x L	24.00	37800.00	Lead =3 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				3780.00	
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2617.00	15702.00	P&M-032
		Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	366.00	4392.00	P&M-054
		Water tanker 6 KL capacity	hour	12.000	488.00	5856.00	P&M-060
		<b>c) Material</b>					
		Lime at site	tonne	15.750	11550.00	181912.50	M-188
		Cost of water	KL	72.000	60.00	4320.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				27058.05	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				29763.86	
		Cost for 300 cum = a+b+c+d+e				327402.41	
		<b>Rate per cum = (a+b+c+d+e)/300</b>				1091.34	
					<b>say</b>	<b><u>1091.00</u></b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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	300.00	144.00	L-12
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		Mazdoor	day	10.000	250.00	2500.00	L-13
		<b>b) Machinery</b>					
		Excavator 0.90 cum bucket capacity	hour	6.000	1571.00	9426.00	P&M-026
		Tipper for carriage of soil	tonne.km	525 x L	24.00	37800.00	Lead =3 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				3780.00	
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2617.00	15702.00	P&M-032
		Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	366.00	4392.00	P&M-054
		Water tanker 6 KL capacity	hour	12.000	488.00	5856.00	P&M-060
		<b>c) Material</b>					
		Cement at site (@ 4 per cent of 525 tonne)	tonne	21.000	8120.00	170520.00	M-081
		Cost of water	KL	72.000	60.00	4320.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				25918.80	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				28510.68	
		Cost for 300 cum = a+b+c+d+e				313617.48	
		<b>Rate per cum= (a+b+c+d+e)/300</b>				1045.39	
					<b>say</b>	<b>1045.00</b>	
4.7	404.3.1	<b>Making 50 mm x 50 mm Furrows</b>					
		Making 50 mm x 50 mm furrows, 25mm/ 50mm deep, 450 to the center line of the road and at one metre interval in the existing thin bituminous wearing coarse including sweeping and disposal of excavated material within 1000 metres lead					
		<b>Unit = sqm</b>					
		<b>Taking output = 30 m x 7 m = 210 sqm</b>					
		<b>(i) 50mm deep furrow cutting</b>					
		<b>a) Labour</b>					
		Mate	day	0.160	300.00	48.00	L-12
		Mazdoor	day	4.000	250.00	1000.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.400	427.00	170.80	P&M-053
		<b>c) Overhead charges @ 10 % on (a+b)</b>				121.88	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				134.07	
		Cost for 210 sqm= a+b+c+d				1474.75	
		<b>Rate per sqm =(a+b+c+d)/210</b>				7.02	
					<b>say</b>	<b>7.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.8	404.3.2	<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					
		<i>Unit = cum</i>					
		<i>Taking output = 600 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.920	300.00	276.00	L-12
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		Mazdoor	day	21.000	250.00	5250.00	L-13
		<b>b) Machinery</b>					
		Motor Grader 110 HP	hour	6.000	2617.00	15702.00	P&M-032
		Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
		Water tanker 6 KL capacity	hour	18.000	488.00	8784.00	P&M-060
		<b>c) Material</b>					
		Screening type 'B' or coarse sand	cum	720.000	540.00	388800.00	M-004
		Cost of water	KL	108.000	60.00	6480.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				43004.00	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				47304.40	
		Cost for 600 cum = a+b+c+d+e				520348.40	
		<b>Rate per cum = ( a+b+c+d+e)/600</b>				867.25	
					<b>say</b>	<b><u>867.00</u></b>	
4.9	404	<b>Water Bound Macadam</b>					
		Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with 3 wheeled steel/ vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.					
		<b>A By Manual Means</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 360 cum</i>					
		<b>a) Labour</b>					
		Mate	day	10.080	300.00	3024.00	L-12
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		Mazdoor	day	250.000	250.00	62500.00	L-13
		<b>b) Machinery</b>					
		Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
		or					
		Smooth 3 wheeled steel roller @ 30cum/hour	hour	12.000			
		Water tanker 6 KL capacity	hour	24.000	488.00	11712.00	P&M-060
		<b>c) Material ( Refer table 400 - 7, 8 &amp; 9 )</b>					
4.9A	(i)	<b>Grading-I</b>					
		<b>Aggregate</b>					
		Grading-I 90 mm to 45 mm@ 1.21cum per 10 sqm for compacted thickness of 100 mm	cum	435.600	782.00	340639.20	M-039

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Stone Screening</b>					
		Type A 13.2 mm for grading-I @ 0.27 cum per 10 sqm	cum	97.200	1700.00	165240.00	M-052
		<b>OR</b>					
		Crushable type such as Moorum or Gravel for grading-I @ 0.30 cum per 10 sqm	cum	108.000	250.00	27000.00	M-007
		<b>Binding material</b>					
		Binding Material @ 0.08cum per 10 sqm for grading I material	cum	28.800	250.00	7200.00	M-007
		Cost of water	KL	144.000	60.00	8640.00	M-189
4.9A (i)	(a)	<b>Using Scriming Crushable type such as Moorum or Gravel</b>					
		d) Overhead charges @ 10 % on (a+b+c)				45826.32	
		e) Contractor's profit @ 10 % on (a+b+c+d)				50408.95	
		Cost for 360 cum = a+b+c+d+e				554498.47	
		Rate per cum = (a+b+c+d+e)/360				1540.27	
					say	<u>1540.00</u>	
		<b>OR</b>					
4.9A (i)	(b)	<b>Using Scriming Type-A (13.2mm agg.)</b>					
		d) Overhead charges @ 10 % on (a+b+c)				60370.32	
		e) Contractor's profit @ 10 % on (a+b+c+d)				66407.35	
		Cost for 360 cum = a+b+c+d+e				730480.87	
		Rate per cum = (a+b+c+d+e)/360				2029.11	
					say	<u>2029.00</u>	
4.9A	(ii)	<b>Grading-II</b>					
		<b>Aggregate</b>					
		Grading-II 63 mm to 45 mm /Grading-III 53 mm to 22.4 mm@ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	804.00	350222.40	M-038
		<b>Stone Screening</b>					
		Type A 13.2 mm for grading-II@ 0.12 cum per 10 sqm	cum	57.600	1700.00	97920.00	M-052
		<b>OR</b>					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	250.00	26397.50	M-007
		<b>OR</b>					
		Type B11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	1750.00	151200.00	M-051
		<b>Binding material</b>					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	250.00	7200.00	M-007
		Cost of water	KL	144.000	60.00	8640.00	M-189
4.9A (ii)	(a)	<b>Using Scriming Crushable type such as Moorum or Gravel</b>					
		d) Overhead charges @ 10 % on (a+b+c)				46724.39	
		e) Contractor's profit @ 10 % on (a+b+c+d)				51396.83	
		Cost for 360 cum = a+b+c+d+e				565365.12	
		Rate per cum = (a+b+c+d+e)/360				1570.46	
					say	<u>1570.00</u>	
		<b>OR</b>					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.9A (ii)		(b)	<b>Using Scriming Type-A (13.2mm agg.)</b>					
			d) Overhead charges @ 10 % on (a+b+c)				54596.64	
			e) Contractor's profit @ 10 % on (a+b+c+d)				60056.30	
			Cost for 360 cum = a+b+c+d+e				660619.34	
			Rate per cum = (a+b+c+d+e)/360				1835.05	
						say	<u>1835.00</u>	
4.9A (ii)		(c)	<b>Using Scriming Type-B (11.2mm agg.)</b>					
			d) Overhead charges @ 10 % on (a+b+c)				59924.64	
			e) Contractor's profit @ 10 % on (a+b+c+d)				65917.10	
			Cost for 360 cum = a+b+c+d+e				725088.14	
			Rate per cum = (a+b+c+d+e)/360				2014.13	
						say	<u>2014.00</u>	
4.9A		(iii)	<b>Grading-III</b>					
			<b>Aggregate</b>					
			Grading-III 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	826.00	359805.60	M-036
			<b>Stone Screening</b>					
			Type B 11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	1750.00	151200.00	M-051
			<b>OR</b>					
			Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	250.00	26397.50	M-007
			<b>Binding material</b>					
			Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	250.00	7200.00	M-007
			Cost of water	KL	144.000	60.00	8640.00	M-189
4.9A (iii)		(a)	<b>Using Scriming Crushable type such as Moorum or Gravel</b>					
			d) Overhead charges @ 10 % on (a+b+c)				47682.71	
			e) Contractor's profit @ 10 % on (a+b+c+d)				52450.98	
			Cost for 360 cum = a+b+c+d+e				576960.79	
			Rate per cum = (a+b+c+d+e)/360				1602.67	
						say	<u>1603.00</u>	
			<b>OR</b>					
4.9A (iii)		(b)	<b>Using Scriming Type-B (11.2mm agg.)</b>					
			d) Overhead charges @ 10 % on (a+b+c)				60882.96	
			e) Contractor's profit @ 10 % on (a+b+c+d)				66971.26	
			Cost for 360 cum = a+b+c+d+e				736683.82	
			Rate per cum = (a+b+c+d+e)/360				2046.34	
						say	<u>2046.00</u>	
			( Anyone of the aggregate grading, screening and binding material may be used as per design)					
4.9		B	<b>By Mechanical Means:</b>					
			<i>Unit = cum</i>					
			<i>Taking output = 360 cum</i>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>a) Labour</b>					
		Mate	day	0.680	300.00	204.00	L-12
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		Mazdoor	day	15.000	250.00	3750.00	L-13
		<b>b) Machinery</b>					
		Motor grader 110 HP @ 50cum/hr. for spreading	hour	7.200	2617.00	18842.40	P&M-032
		Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
		or					
		Smooth 3 wheeled steel roller @ 30cum/hr.	hour	12.000			
		Water tanker 6 KL capacity	hour	24.000	488.00	11712.00	P&M-060
		<b>c) Material ( Refer table 400 - 7, 8 &amp; 9 )</b>					
4.9B	(i)	<b>Grading-I</b>					
		<b>Aggregate</b>					
		Grading-I 90 mm to 45 mm@ 1.21cum per 10 sqm for compacted thickness of 100 mm	cum	435.600	782.00	340639.20	M-039
		<b>Stone Screening</b>					
		Type A 13.2 mm for grading-I @ 0.27 cum per 10 sqm	cum	97.200	1700.00	165240.00	M-052
		OR					
		Crushable type such as Moorum or Gravel for grading-I @ 0.30 cum per 10 sqm	cum	108.000	250.00	27000.00	M-007
		<b>Binding material</b>					
		Binding Material @ 0.08cum per 10 sqm for grading I material	cum	28.800	250.00	7200.00	M-007
		Cost of water	KL	144.000	60.00	8640.00	M-189
4.9B (i)	(a)	<b>Using Scriming Crushable type such as Moorum or Gravel</b>					
		d) Overhead charges @ 10 % on (a+b+c)				41553.56	
		e) Contractor's profit @ 10 % on (a+b+c+d)				45708.92	
		Cost for 360 cum = a+b+c+d+e				502798.08	
		Rate per cum = (a+b+c+d+e)/360				1396.66	
					say	<u>1397.00</u>	
		OR					
4.9B (i)	(b)	<b>Using Scriming Type-A (13.2mm agg.)</b>					
		d) Overhead charges @ 10 % on (a+b+c)				56097.56	
		e) Contractor's profit @ 10 % on (a+b+c+d)				61707.32	
		Cost for 360 cum = a+b+c+d+e				678780.48	
		Rate per cum = (a+b+c+d+e)/360				1885.50	
					say	<u>1886.00</u>	
4.9B	(ii)	<b>Grading-II</b>					
		<b>Aggregate</b>					
		Grading-II 63 mm to 45 mm /Grading-III 53 mm to 22.4 mm@ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	804.00	350222.40	M-038
		<b>Stone Screening</b>					
		Type A 13.2 mm for grading-II@ 0.12 cum per 10 sqm	cum	57.600	1700.00	97920.00	M-052
		OR					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	250.00	26397.50	M-007
		OR					
		Type B11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	1750.00	151200.00	M-051
		<b>Binding material</b>					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	250.00	7200.00	M-007
		Cost of water	KL	144.000	60.00	8640.00	M-189

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.9B (ii)	(a)	<b>Using Scriming Crushable type such as Moorum or Gravel</b>					
		d) Overhead charges @ 10 % on (a+b+c)				42451.63	
		e) Contractor's profit @ 10 % on (a+b+c+d)				46696.79	
		Cost for 360 cum = a+b+c+d+e				513664.72	
		Rate per cum = (a+b+c+d+e)/360				1426.85	
					say	<u>1427.00</u>	
		OR					
4.9B (ii)	(b)	<b>Using Scriming Type-A (13.2mm agg.)</b>					
		d) Overhead charges @ 10 % on (a+b+c)				50323.88	
		e) Contractor's profit @ 10 % on (a+b+c+d)				55356.27	
		Cost for 360 cum = a+b+c+d+e				608918.95	
		Rate per cum = (a+b+c+d+e)/360				1691.44	
					say	<u>1691.00</u>	
4.9B (ii)	(c)	<b>Using Scriming Type-B (11.2mm agg.)</b>					
		d) Overhead charges @ 10 % on (a+b+c)				55651.88	
		e) Contractor's profit @ 10 % on (a+b+c+d)				61217.07	
		Cost for 360 cum = a+b+c+d+e				673387.75	
		Rate per cum = (a+b+c+d+e)/360				1870.52	
					say	<u>1871.00</u>	
4.9B	(iii)	<b>Grading-III</b>					
		<b>Aggregate</b>					
		Grading-III 53 mm to 22.4 mm@ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	826.00	359805.60	M-036
		<b>Stone Screening</b>					
		Type B11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	1750.00	151200.00	M-051
		OR					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	250.00	26397.50	M-007
		<b>Binding material</b>					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	250.00	7200.00	M-007
		Cost of water	KL	144.000	60.00	8640.00	M-189
4.9B (iii)	(a)	<b>Using Scriming Crushable type such as Moorum or Gravel</b>					
		d) Overhead charges @ 10 % on (a+b+c)				43409.95	
		e) Contractor's profit @ 10 % on (a+b+c+d)				47750.95	
		Cost for 360 cum = a+b+c+d+e				525260.40	
		Rate per cum = (a+b+c+d+e)/360				1459.06	
					say	<u>1459.00</u>	
		OR					
4.9B (iii)	(b)	<b>Using Scriming Type-B (11.2mm agg.)</b>					
		d) Overhead charges @ 10 % on (a+b+c)				56610.20	
		e) Contractor's profit @ 10 % on (a+b+c+d)				62271.22	
		Cost for 360 cum = a+b+c+d+e				684983.42	
		Rate per cum = (a+b+c+d+e)/360				1902.73	
					say	<u>1903.00</u>	
	<b>Note</b>	As three wheeled smooth rollers are also very commonly used, the same has been provided as an alternative.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.10	405	<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.					
		<b>Unit = cum</b>					
		<b>Taking output = 360 cum</b>					
		<b>a) Labour</b>					
		Mate	day	4.160	300.00	1248.00	L-12
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		Mazdoor for crushing broken cement concrete pavement/slabs into aggregate	day	102.000	250.00	25500.00	L-13
		<b>b) Machinery</b>					
		Motor Grader, 110 HP @ 50 cum/hr.	hour	6.000	2617.00	15702.00	P&M-032
		Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
		or					
		Smooth 3 wheeled steel roller @ 30cum/hr.	hour	12.000			
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	720 x L	24.00	0.00	Lead = 0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Water tanker 6 KL capacity with 5 km lead @ 1 trip per hour	hour	12.000	488.00	5856.00	P&M-060
		<b>c) Material</b>					
		Material available from dismantled concrete slab after crushing / breaking and only carriage is required to be provided					
		Cost of water	KL	72.000	60.00	4320.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				6489.20	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				7138.12	
		Cost for 360 cum = a+b+c+d+e				78519.32	
		<b>Rate per cum = (a+b+c+d+e)/360</b>				218.11	
					<b>say</b>	<b>218.00</b>	
		<b>Note</b>					
		1. It is assumed that dismantling of concrete slab/pavement has been considered separately. Hence same is not added in this analysis. Only labour for crushing the dismantled slab into aggregate has been added. Carriage from stock pile to work site has been provided with a lead of L km.					
		2. In case of breaking of slabs is done locally without involvement of transportation, the provision of tipper, front end loader and loading/unloading charges may be deleted.					
		3. As three wheeled smooth steel rollers are commonly in use, the same has been provided as an alternative.					
4.11	405.2	<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					
		<b>Unit = sqm</b>					
		<b>Taking output = 7500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.560	300.00	168.00	L-12
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		Mazdoor	day	12.000	250.00	3000.00	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Mechanical broom hydraulic @ 1250 sqm per hour	hour	6.000	389.00	2334.00	P&M-031
		Hydraulic self propelled chips spreader	hour	6.000	2880.00	17280.00	P&M-025
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 10 tonne capacity	hour	6.000	609.00	3654.00	P&M-048
		Three wheel 80-100 kN Statis Roller	hour	6.00x0.65*	658.00	2566.20	P&M-059
		Bitumen pressure distributor @ 1750 sqm per hour	hour	4.280	1174.00	5024.72	P&M-004
		<b>c) Material</b>					
		Crushed stone aggregate 11.2 mm size	cum	97.500	1750.00	170625.00	M-051
		Bitumen (80-100 grade)	tonne	0.250	48810.00	12202.50	M-074
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				22517.24	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				24768.97	
		Cost for 7500 sqm = a+b+c+d+e				272458.63	
		<b>Rate per sqm = (a+b+c+d+e)/7500</b>				36.33	
					<b>say</b>	<b><u>36.00</u></b>	
		<b>Note</b>					
		Though vibratory roller is required only for 3 hours as per norms, the same is required to be available at site for 6 hours to match with other machines. The usage rates of vibratory roller may be multiplied with a factor of 0.65.					
4.12	406	<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	300.00	144.00	L-12
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		Mazdoor	day	10.000	250.00	2500.00	L-13
		<b>b) Machinery</b>					
		Wet mix plant of 75 tonne hourly capacity	hour	9.000	1452.00	13068.00	P&M-094
		Electric generator 125 KVA	hour	6.000	787.00	4722.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1253.00	7518.00	P&M-017
		Paver finisher	hour	6.000	1065.00	6390.00	P&M-035
		Three wheel 80-100 kN Statis Roller	hour	6x0.65	658.00	2566.20	P&M-059
		or					
		Smooth 3 wheeled steel roller @ 8-10 tonnes.	hour	12.000			
		Water tanker 6 KL capacity	hour	3.000	488.00	1464.00	P&M-060
		Tipper	tonne.km	495 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		<b>c) Material ( Table 400-11)</b>					
		45 mm to 22.4 mm@ 30 per cent	cum	89.100	850.00	75735.00	M-034
		22.4 mm to 2.36 mm @ 40 per cent	cum	118.800	875.00	103950.00	M-031
		2.36 mm to 75 micron@ 30 per cent	cum	89.100	560.00	49896.00	M-022
		Cost of water	KL	18.000	60.00	1080.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				26983.32	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				29681.65	
		Cost for 225 cum = a+b+c+d+e				326498.17	
		<b>Rate per cum = (a+b+c+d+e)/225</b>				1451.10	
					<b>say</b>	<b>1451.00</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	300.00	72.00	L-12
		Mazdoor	day	6.000	250.00	1500.00	L-13
		<b>b) Machinery</b>					
		Water tanker 6 KL with 5 km lead and 1 trip per hour	hour	1.000	488.00	488.00	P&M-060
		Plate compactor @ 3.5 cum per hour	hour	6.000	303.00	1818.00	P&M-086
		<b>c) Material</b>					
		Cost of water	KL	6.000	60.00	360.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				423.80	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				466.18	
		Cost for 21 cum = a+b+c+d+e				5127.98	
		<b>Rate per cum = (a+b+c+d+e)/21</b>				244.19	
					<b>say</b>	<b>244.00</b>	
		<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>					
		<b>a) Labour</b>					
		Mate	day	0.160	300.00	48.00	L-12
		Mazdoor	day	4.000	250.00	1000.00	L-13
		<b>b) Machinery</b>					
		Water tanker with 5 km lead	hour	1.000	488.00	488.00	P&M-060
		Plate Compactor @ 3.5 cum per hour	hour	6.000	303.00	1818.00	P&M-086
		Hydraulic Excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.500	1571.00	785.50	P&M-026
		Tipper 10 tonne capacity	tonne.km	52.5 x L	24.00	3780.00	Lead =3 km & P&M-058

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add 10 per cent of cost of transportation to cover cost of loading and unloading				378.00	
		c) Material					
		Cost of water	KL	6.000	60.00	360.00	M-189
		d) Overhead charges @ 10 % on (a+b+c)				865.75	
		e) Contractor's profit @ 10 % on (a+b+c+d)				952.33	
		Cost for 21 cum = a+b+c+d+e				10475.58	
		Rate per cum = (a+b+c+d+e)/ 21				498.84	
					say	<u>499.00</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.					
4.15		<b>Construction of Shoulders</b>					
		<b>A. Earthen Shoulders</b>					
		The rate as applicable for sub-grade construction may be adopted.					
		<b>B. Hard Shoulders</b>					
		Rate as applicable for sub-base and or base may be adopted as per approved design.					
		<b>C. Paved shoulders</b>					
		The rate may be adopted as applicable for different layers of pavement depending upon approved design of paved shoulders.					
4.17	410	<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>Unit = cum</b>					
		<b>Taking output = 360 cum</b>					
		<b>A By Mix in Place Method</b>					
		<b>a) Labour</b>					
		Mate	day	0.480	300.00	144.00	L-12
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		Mazdoor	day	10.000	250.00	2500.00	L-13
		<b>b) Machinery</b>					
		Tractor attached with rotavator @ 25 cum per hour	hour	12.000	366.00	4392.00	P&M-054
		Motor grader 110 HP	hour	6.000	2617.00	15702.00	P&M-032
		Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
		Water tanker 6 KL capacity	hour	6.000	488.00	2928.00	P&M-060
		<b>c) Material</b>					
		Aggregate at site					
		<b>i) For 53 mm maximum size</b>					
		63 mm to 45 mm @ 33 per cent	cum	157.460	804.00	126597.84	M-038
		22.5 mm to 5.6 mm @ 32 per cent	cum	151.060	1365.00	206196.90	M-032
		Below 5.6 mm @ 35 per cent	cum	166.680	1640.00	273355.20	M-030
		Cost of water	KL	36.000	60.00	2160.00	M-189
		<b>Or</b>					
		<b>ii) For 45 mm maximum size</b>					
		45 mm to 22.5 mm @ 5 per cent	cum	24.120	850.00	20502.00	M-034
		22.4 mm to 5.6 mm @ 50 per cent	cum	237.600	1365.00	324324.00	M-032
		Below 5.6 mm @ 45 per cent	cum	213.480	1640.00	350107.20	M-030
		Cost of water	KL	36.000	60.00	2160.00	M-189

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.17A	(i)	For 53 mm maximum size					
		d) Overhead charges @ 10 % on (a+b+c)				63872.39	
		e) Contractor's profit @ 10 % on (a+b+c+d)				70259.63	
		Cost for 360.0cum = a+b+c+d+e				772855.97	
		Rate per cum = (a+b+c+d+e)/360				2146.82	
		or			say	<u>2147.00</u>	
4.17A	(ii)	For 45 mm maximum size					
		d) Overhead charges @ 10 % on (a+b+c)				72750.72	
		e) Contractor's profit @ 10 % on (a+b+c+d)				80025.79	
		Cost for 360.0cum = a+b+c+d+e				880283.71	
		Rate per cum = (a+b+c+d+e)/360				2445.23	
					say	<u>2445.00</u>	
	Note	Any one of the aggregate grading may be adopted					
4.17	B	By Mixing Plant :					
		Unit = cum					
		Taking output = 225 cum (450 tonnes)					
		a) Labour					
		Mate	day	0.280	300.00	84.00	L-12
		Mazdoor skilled	day	1.000	400.00	400.00	L-15
		Mazdoor	day	6.000	250.00	1500.00	L-13
		b) Machinery					
		Wet mix plant @ 75 tonne per hour	hour	6.000	1815.00	10890.00	P&M-093
		Electric generator 125 KVA	hour	6.000	787.00	4722.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Motor grader 110 HP	hour	6.000	2617.00	15702.00	P&M-032
		Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
		Water tanker 6 KL capacity	hour	3.000	488.00	1464.00	P&M-060
		Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		c) Material					
		Aggregate at site					
		i) For 53 mm maximum size					
		63 mm to 45 mm @ 33 per cent	cum	98.400	804.00	79113.60	M-038
		22.5 mm to 5.6 mm@ 32 per cent	cum	94.410	1365.00	128869.65	M-032
		Below 5.6 mm @ 35 per cent	cum	104.180	1640.00	170855.20	M-030
		Or					
		ii) For 45 mm maximum size					
		45 mm to 22.5 mm@ 5 per cent	cum	15.060	850.00	12801.00	M-034
		22.4 mm to 5.6 mm@ 50 per cent	cum	148.500	1365.00	202702.50	M-032
		Below 5.6 mm@ 45 per cent	cum	133.430	1640.00	218825.20	M-030
		Cost of water	KL	18.000	60.00	1080.00	M-189
4.17 B	(i)	For 53 mm maximum size					
		d) Overhead charges @ 10 % on (a+b+c)				42506.65	
		e) Contractor's profit @ 10 % on (a+b+c+d)				46757.31	
		Cost for 225cum = a+b+c+d+e				514330.40	
		Rate per cum = (a+b+c+d+e)/225				2285.91	
					say	<u>2286.00</u>	
4.17 B	(ii)	For 45 mm maximum size					
		d) Overhead charges @ 10 % on (a+b+c)				48163.67	
		e) Contractor's profit @ 10 % on (a+b+c+d)				52980.04	
		Cost for 360.0cum = a+b+c+d+e				582780.41	
		Rate per cum = (a+b+c+d+e)/360				1618.83	
					say	<u>1619.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.18		<b>Preparation of sub grade</b>					
	(A)	Preparation of sub grade by excavating earth to an average depth of 22.50 cm, dressing to camber and consolidating with road roller, making good the undulations etc. and disposal of surplus earth, lead upto 50 m.					
		<i>Unit = Sq.m.</i>					
		<i>Taking output = 100 Sq.m.</i>					
		<b>a) Labour</b>					
		Mate	day	1.800	300.00	540.00	L-12
		Mazdoor	day	18.000	250.00	4500.00	L-13
		Mazdoor for consolidation of sub-grade	day	0.270	250.00	67.50	L-13
		Mazdoor for watch & ward	day	0.054	250.00	13.50	L-13
		<b>b) Machinery</b>					
		Three wheel 80-100 kN Statis Roller	hour	0.430	658.00	282.94	M-189
		<b>c) Overhead charges @ 10 % on (a+b)</b>				540.39	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				594.43	
		Cost for 100 Sq.m. = a+b+c+d				6538.77	
		<b>Rate per Sq.m. = (a+b+c+d)/ 100</b>				65.39	
					<b>say</b>	<b><u>65.00</u></b>	
	(B)	Consolidation of sub-grade with road roller of 8 to 12 tonne capacity including making good the undulations etc. with earth or quarry spoils etc. and rerolling the sub grade.					
		<i>Unit = Sq.m.</i>					
		<i>Taking output = 100 Sq.m.</i>					
		<b>a) Labour</b>					
		Mazdoor for watch & ward	day	0.054	250.00	13.50	L-13
		<b>b) Machinery</b>					
		Three wheel 80-100 kN Statis Roller	hour	0.430	658.00	282.94	M-189
		<b>c) Overhead charges @ 10 % on (a+b)</b>				29.64	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				32.61	
		Cost for 100 Sq.m. = a+b+c+d				358.69	
		<b>Rate per Sq.m. = (a+b+c+d)/ 100</b>				3.59	
					<b>say</b>	<b><u>3.59</u></b>	

## Chapter – 5

### BASES AND SURFACE COURSES (BITUMINOUS)

#### Preamble:

- 1 Various alternatives for machines and materials have been provided. The one that suits a particular situation and design may be adopted.
- 2 The outputs considered for construction equipment are for compacted quantities of relevant items and not for loose quantities.
- 3 In case of prime coat and tack coat, average quantities of binder indicated in specifications have been taken.
- 4 Tack coat and prime coat, wherever provided, are required to be measured and paid separately.
- 5 Cleaning of surface is a part of the item of prime coat and tack coat. As such cleaning of surface has not been provided for bituminous courses as the same is already catered in prime/tack coat. However, for those cases where such coats are not required to be done, cleaning of surface shall be included and paid.
- 6 Rolling of bituminous courses is required to be done as per Clause 501.6 of MORD Specifications. Provision in the analysis has been made accordingly. It has been observed during actual practice at work sites, that the availability of road roller is generally inadequate. As compaction is the key to good construction, this point is being specifically highlighted to ensure that adequate number of road rollers as per provision in the rate analysis are deployed at site.
- 7 Spreading of bituminous materials shall be done by mechanical means except in areas where a mechanical paver cannot have access.
- 8 Hot Mazdoor is the one who work for Bitumen heating/spreading or spreading of hot bituminous mix. He will be paid the same wages. However, he will be provided safety kits containing normally gumboots, hand gloves, dark goggles, barnol, country soap, coconut oil, tarring outfits, etc. For this purpose, additional 0.5 per cent sundries have been provided in the analysis of rates in addition to the normal sundries covered by overheads.
- 9 Where the proposed aggregates fail to pass the stripping value test, an approved adhesion agent shall be added to the binder as per Clause 507.2.4 with the approval of the Engineer and cost of the adhesion agent shall be added under the subhead of materials.
- 10 The Factor for usage of rollers has been taken as 0.65 in case of Bituminous Macadam only.

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>					
			a) Labour					
			Mate	day	0.080	300.00	24.00	L-12
			Mazdoor	day	2.000	250.00	500.00	L-13
			b) Machinery					
			Mechanical broom @ 1250 sqm per hour	hour	2.800	389.00	1089.20	P&M-031
			Air compressor 250 cfm	hour	2.800	516.00	1444.80	P&M-001
			Bitumen pressure distributor @ 1750 sqm per hour	hour	2.000	1174.00	2348.00	P&M-004
			Water tanker 6 KL capacity @ 1 trip per hour	hour	1.000	488.00	488.00	P&M-060
			c) Material					
			Bitumen emulsion @ 0.6 kg per sqm	tonne	2.100	39586.00	83130.60	M-077
			Cost of water	KL	6.000	60.00	360.00	M-189
			d) Overhead charges @ 10 % on (a+b+c)				8938.46	
			e) Contractor's profit @ 10 % on (a+b+c+d)				9832.31	
			Cost for 3500 sqm = a+b+c+d+e				108155.37	
			Rate per sqm = (a+b+c+d+e)/3500				30.90	
						say	<u>31.00</u>	
		Note	Bitumen primer has been provided @ 0.60 kg per sqm as per clause 502.8. Payment shall be made with adjustment, plus or minus, for the variation between this quantity and the actual quantity approved by the Engineer after the preliminary trials referred to in clause No. 502.4.3.					
5.2	503		<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>					
			a) Labour					
			Mate	day	0.080	300.00	24.00	L-12
			Mazdoor	day	2.000	250.00	500.00	L-13
			b) Machinery					
			Mechanical broom @ 1250 sqm per hour	hour	2.800	389.00	1089.20	P&M-031
			Air compressor 250 cfm	hour	2.800	516.00	1444.80	P&M-001
			Emulsion pressure distributor @ 1750 sqm per hour	hour	2.000	1174.00	2348.00	P&M-004
			c) Material					
			Bitumen emulsion @ 0.2 kg per sqm	tonne	0.700	39586.00	27710.20	M-077
			d) Overhead charges @ 10 % on (a+b+c)				3311.62	
			e) Contractor's profit @ 10 % on (a+b+c+d)				3642.78	
			Cost for 3500 sqm = a+b+c+d+e				40070.60	
			Rate per sqm = (a+b+c+d+e)/3500				11.45	
						say	<u>11.00</u>	
		Note	1. Bitumen emulsion has been provided @ 0.20 kg per sqm as per clause 503.8. Payment shall be made with adjustment, plus or minus, for the variation between this quantity and actual quantity approved by the Engineer after preliminary trials referred to in clause No. 503.4.3					
			2. An output of 3500 sqm has been considered in case of prime coat and tack coat which can be covered by bituminous courses on the same day.					
5.3	504		<b>Bituminous Macadam</b>					
			Providing and laying bituminous macadam with 100-120 TPH hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading premixed with bituminous binder, transported to site, laid over a previously prepared surface with paver finisher to the required grade, level and alignment and rolled as per clauses 501.6 and 501.7 to achieve the desired compaction					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = cum</b>					
		<b>Taking output = 205 cum (450 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	300.00	252.00	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	250.00	4000.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	400.00	2000.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP 100-120 TPH @ 75 tonne per hour actual output	hour	6.000	25579.00	153474.00	P&M-021
		Mechanical broom hydraulic @ 1250 sqm per hour	hour	2.200	389.00	855.80	P&M-031
		Air compressor 250 cfm	hour	2.200	516.00	1135.20	P&M-001
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2923.00	17538.00	P&M-034
		Generator 250 KVA	hour	6.000	908.00	5448.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	504.00	1965.60	P&M-044
		Three wheel 80-100 kN Statis Roller	hour	6.00x0.65*	658.00	2566.20	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1250.00	4875.00	P&M-045
		<b>c) Material</b>					
		<b>i) Bitumen@ 3.3 per cent of mix</b>	tonne	14.850	48810.00	724828.50	M-074
		weight of mix = 205 x 2.2 = 450 tonne					
		<b>ii) Aggregate</b>					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 14.85 tonnes					
		Weight of aggregate = 450 -14.85 = 435.15 tonnes					
		<b>Taking density of aggregate = 1.5 ton/cum</b>					
		Volume of aggregate = 290.1 cum					
		<b>*Grading I ( 40 mm nominal size )</b>					
		37.5 - 25 mm 15 per cent	cum	43.510	850.00	36983.50	M-049
		25 - 10 mm 45 per cent	cum	130.550	1350.00	176242.50	M-046
		10 - 5 mm 25 per cent	cum	72.530	1750.00	126927.50	M-040
		5 mm and below 15 per cent	cum	43.510	1640.00	71356.40	M-030
		or					
		<b>Grading II (19 mm nominal size)</b>					
		25 - 10 mm 40 per cent	cum	116.040	1350.00	156654.00	M-046
		10 - 5 mm 40 per cent	cum	116.040	1750.00	203070.00	M-040
		5 mm and below 20 per cent	cum	58.020	1640.00	95152.80	M-030
		* Any one of the alternative may be adopted as per approved design					
		<b>(i) for Grading I ( 40 mm nominal size )</b>					
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				133796.62	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				147176.28	
		Cost for 205 cum = a+b+c+d+e				1618939.10	
		<b>Rate per cum = (a+b+c+d+e)/205 (For Grading I)</b>				7897.26	
					<b>say</b>	<b>7897.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	(ii)	for GradingII(19 mm nominal size)					
		d) Overhead charges @ 10 % on (a+b+c)				138133.31	
		e) Contractor's profit @ 10 % on (a+b+c+d)				151946.64	
		Cost for 205 cum = a+b+c+d+e				1671413.05	
		Rate per cum = (a+b+c+d+e)/205 (For Grading-II)				8153.23	
					say	<u>8153.00</u>	
	Note	*1. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a 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 BM is laid over freshly laid tack coat, provision of Mechanical broom and 2 mazdoors for the same shall be deleted as the same has been included in the cost of tack coat.					
5.4	505	<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					
	A	<b>50 mm thick</b>					
		<b>Unit = sqm</b>					
		<b>Taking output = 4500 sqm (225 cum)</b>					
		<b>a) Labour</b>					
		Mate	day	0.320	300.00	96.00	L-12
		Mazdoor including for brooming of key aggregates	day	6.000	250.00	1500.00	L-13
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		<b>b) Machinery</b>					
		Hydraulic self propelled chip spreader both for aggregates and key aggregates@ 1500 sqm per hour for 4500 x 2 sqm = 9000 sqm	hour	6.000	2880.00	17280.00	P&M-025
		Bitumen pressure distributor for @ 1750 sqm per hour	hour	2.570	1174.00	3017.18	P&M-004
		Tipper 5.5 cum capacity for carriage of aggregates from stockpile to chip spreader	hour	10.000	609.00	6090.00	P&M-048
		Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		<b>c) Material</b>					
		Bitumen@ 5 kg per sqm	tonne	22.500	48810.00	1098225.00	M-074
		Crushed stone coarse aggregate passing 45 mm and retained on 2.8 mm sieve @ 0.06 cum per sqm	cum	270.000	640.00	172800.00	M-033
		Key aggregates passing 22.4 mm and retained on 2.8 mm sieve @ 0.015 cum per sqm	cum	67.500	875.00	59062.50	M-031
		d) Overhead charges @ 10 % on (a+b+c)				137033.67	
		e) Contractor's profit @ 10 % on (a+b+c+d)				150737.03	
		Cost for 4500 sqm = a+b+c+d+e				1658107.38	
		Rate per sqm = (a+b+c+d+e)/4500				368.47	
					say	<u>368.00</u>	
	Note	2 tippers will be needed to match the capacity of chip spreader and front end loader.					
5.4	B	<b>75 mm thick</b>					
		<b>Unit = sqm</b>					
		<b>Taking output = 4500 sqm (337.5 cum compacted).</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>a) Labour</b>					
		Mate	day	0.400	300.00	120.00	L-12
		Mazdoor including for brooming of key aggregates	day	8.000	250.00	2000.00	L-13
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		<b>b) Machinery</b>					
		Hydraulic self propelled chip spreader both for aggregates and key aggregates@ 1500 sqm per hour for 4500 x 2 sqm	hour	6.000	2880.00	17280.00	P&M-025
		Bitumen pressure distributor for@ 1750 sqm per hour	hour	2.570	1174.00	3017.18	P&M-004
		Tipper 5.5 cum capacity for carriage of aggregates from stockpile to chip spreader	hour	10.000	609.00	6090.00	P&M-048
		Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		<b>c) Material</b>					
		Bitumen@ 6.8 kg per sqm	tonne	30.600	48810.00	1493586.00	M-074
		Crushed stone coarse aggregate (loose passing 63 mm and retained on 2.8 mm sieve @ 0.09 cum per sqm	cum	405.000	675.00	273375.00	M-037
		Key aggregates passing 26.5 mm and retained on 2.8 mm sieve @ 0.018 cum per sqm	cum	81.000	700.00	56700.00	M-026
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				186443.42	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				205087.76	
		Cost for 4500 sqm = a+b+c+d+e				2255965.36	
		<b>Rate per sqm = (a+b+c+d+e)/4500</b>				501.33	
						<b>say</b>	<b><u>501.00</u></b>
		<b>Note</b>					2 tippers and 2 rollers will be needed to match the capacity of chip spreader and front end loader.
5.5	506	<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					
		<b>Unit = sqm</b>					
		<b>Taking output = 3000 sqm (225 cum)</b>					
		<b>a) Labour</b>					
		Mate	day	0.400	300.00	120.00	L-12
		Mazdoor including for brooming of key aggregates	day	8.000	250.00	2000.00	L-13
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		<b>b) Machinery</b>					
		Hydraulic self propelled chip spreader both for aggregates and key aggregates@ 1500 sqm per hour for 3000 x 3 sqm	hour	6.000	2880.00	17280.00	P&M-025
		Bitumen pressure distributor for 3000 x 2 sqm @ 1750 sqm per hour	hour	3.430	1174.00	4026.82	P&M-004
		Tipper 5.5 cum capacity	hour	10.000	609.00	6090.00	P&M-048
		Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		<b>c) Material</b>					
		Bitumen30 kg per 10 sqm @ 15 kg per 10 sqm for each layer	tonne	9.000	48810.00	439290.00	M-074
		Crushed stone coarse aggregate passing 53 mm and retained on 2.8 mm sieve @ 0.5 cum per 10 sqm for each layer	cum	300.000	700.00	210000.00	M-035
		Key aggregates passing 22.4 mm and retained on 2.8 mm sieve @ 0.13 cum per 10 sqm	cum	39.000	875.00	34125.00	M-031

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 10 % on (a+b+c)				72519.78	
		e) Contractor's profit @ 10 % on (a+b+c+d)				79771.76	
		Cost for 3000 sqm = a+b+c+d+e				877489.36	
		Rate per sqm = (a+b+c+d+e)/3000				292.50	
					say	<b>292.00</b>	
		<b>Note</b> 2 tippers will be needed to match the capacity of hydraulic chip spreader and front end loader.					
5.6	507	<b>Dense Graded Bituminous Macadam</b>					
		Providing and laying dense graded bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5 per cent by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.					
		<b>Unit = cum</b>					
		<b>Taking output = 195 cum (450 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	300.00	252.00	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	250.00	4000.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	400.00	2000.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	18917.00	113502.00	P&M-022
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2923.00	17538.00	P&M-034
		Generator 250 KVA	hour	6.000	908.00	5448.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	504.00	1965.60	P&M-044
		Three wheel 80-100 kN Statis Roller	hour	6.00x0.65*	658.00	2566.20	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1250.00	4875.00	P&M-045
		<b>c) Materials</b>					
		Bitumen @ 4.25 per cent of weight of mix	tonne	19.130	48810.00	933735.30	M-074
		<b>Aggregate</b>					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 19.13 tonnes					
		Weight of aggregate = 450 -19.13 = 430.87 tonnes					
		<b>Taking density of aggregate = 1.5 ton/cum</b>					
		Volume of aggregate = 287.25 cum					
		<b>Grading - I40 mm (Nominal Size)</b>					
		37.5 - 25 mm 22 per cent	cum	63.190	850.00	53711.50	M-049
		25 - 10 mm 13 per cent	cum	37.340	1350.00	50409.00	M-046
		10 - 4.75 mm 19 per cent	cum	54.580	1750.00	95515.00	M-040
		4.75 mm and below 44 per cent	cum	126.390	1640.00	207279.60	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	11550.00	99561.00	M-188
		<b>or</b>					
		<b>Grading - II19 mm (Nominal Size)</b>					
		25 - 10 mm 30 per cent	cum	86.160	1350.00	116316.00	M-046
		10 - 5 mm 28 per cent	cum	80.430	1750.00	140752.50	M-040
		5 mm and below 40 per cent	cum	114.900	1640.00	188436.00	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	11550.00	99561.00	M-188

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		* Any one of the alternative may be adopted as per approved design					
		(i) For Grading I ( 40 mm nominal size )					
		d) Overhead charges @ 10 % on (a+b+c)				159987.62	
		e) Contractor's profit @ 10 % on (a+b+c+d)				175986.38	
		Cost for 205 cum = a+b+c+d+e				1935850.20	
		Rate per cum = (a+b+c+d+e)/195 (For Grading I)				9927.44	
					say	<b>9927.00</b>	
		(ii) For GradingII(19 mm nominal size)					
		d) Overhead charges @ 10 % on (a+b+c)				163846.56	
		e) Contractor's profit @ 10 % on (a+b+c+d)				180231.22	
		Cost for 205 cum = a+b+c+d+e				1982543.38	
		Rate per cum = (a+b+c+d+e)/195 (For Grading-II)				10166.89	
					say	<b>10167.00</b>	
		<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 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a factor of 0.65.					
		2.Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
		4. In case DBM is laid over freshly laid tack coat, provision of mechanical broom and 2 mazdoors shall be deleted as the same has been included in the cost of tack coat.					
		5. The individual density for each size of aggregates to be used for construction i.e. 37.5-25 mm, 25-10 mm etc. should be found in the laboratory and accordingly the quantities should be 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.					
5.7	508	<b>Semi-Dense Bituminous Concrete</b>					
		Providing and laying semi dense bituminous concrete with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.5 to 5 per cent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 508 complete in all respects					
		<b>Unit = cum</b>					
		<b>Taking output = 195 cum (450 tonnes)</b>					
		a) Labour					
		Mate	day	0.840	300.00	252.00	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	250.00	4000.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	400.00	2000.00	L-15

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	18917.00	113502.00	P&M-022
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2923.00	17538.00	P&M-034
		Generator 250 KVA	hour	6.000	908.00	5448.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	504.00	1965.60	P&M-044
		Three wheel 80-100 kN Statis Roller	hour	6.00x0.65*	658.00	2566.20	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller	hour	6.00x0.65*	1250.00	4875.00	P&M-045
		<b>c) Material</b>					
		<b>* Grading I: 13 mm (Nominal Size)</b>					
		<b>i) Bitumen@ 4.5 per cent of weight of mix</b>	tonne	20.250	48810.00	988402.50	M-074
		<b>ii) Aggregate</b>					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 20.25 tonnes					
		Weight of aggregate = 450-20.25 = 429.75 tonnes					
		Taking density of aggregate = 1.5 ton/cum					
		Volume of aggregate = 286.5 cum					
		13.2 - 10 mm@ 20 per cent	cum	57.300	1338.00	76667.40	M-044
		10 - 5 mm @ 38 per cent	cum	108.870	1750.00	190522.50	M-040
		5 mm and below @ 40 per cent	cum	114.600	1640.00	187944.00	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	11550.00	99561.00	M-188
		<b>or</b>					
		<b>Grading II: 10 mm (Nominal Size)</b>					
		<b>Bitumen@5 per cent of weight of mix</b>	tonne	22.500	48810.00	1098225.00	M-074
		weight of mix = 450 tonne					
		<b>Aggregate</b>					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 22.5 tonnes					
		Weight of aggregate = 450 -22.50 = 427.50 tonnes					
		Taking density of aggregate = 1.5 ton/cum					
		Volume of aggregate = 285 cum					
		9.5 - 4.75 mm@ 57 per cent	cum	162.450	1750.00	284287.50	M-040
		4.75 and below@ 41 per cent	cum	116.850	1640.00	191634.00	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	11550.00	99561.00	M-188
		<b>*Any one of the alternative may be adopted as per approved design</b>					
	(i)	<b>for Grading I ( 13 mm nominal size )</b>					
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				170276.22	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				187303.84	
		Cost for 205 cum = a+b+c+d+e				2060342.26	
		<b>Rate per cum = (a+b+c+d+e)/195 (For Grading I)</b>				10565.86	
						<b>say</b>	<b>10566.00</b>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.7	(ii)	for GradingII(10 mm nominal size)					
		d) Overhead charges @ 10 % on (a+b+c)				183337.23	
		e) Contractor's profit @ 10 % on (a+b+c+d)				201670.95	
		Cost for 205 cum = a+b+c+d+e				2218380.48	
		Rate per cum = (a+b+c+d+e)/195 (For Grading-II)				11376.31	
					say	<b>11376.00</b>	
	Note	*1. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a 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 SDBC is laid over freshly laid tack coat, provision of broom and 2 mazdoor shall be deleted as the same has been included in the cost of tack coat.					
		5. The quantity of Bitumen to be adjusted as per job mix formula.					
5.8	509	<b>Bituminous Concrete</b>					
		Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 per cent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects					
		<b>Unit = cum</b>					
		<b>Taking output = 191 cum (450 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	300.00	252.00	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	250.00	4000.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	400.00	2000.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	18917.00	113502.00	P&M-022
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2923.00	17538.00	P&M-034
		Generator 250 KVA	hour	6.000	908.00	5448.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	504.00	1965.60	P&M-044
		Three wheel 80-100 kN Statis Roller	hour	6.00x0.65*	658.00	2566.20	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1250.00	4875.00	P&M-045
		<b>c) Material</b>					
		<b>i) Bitumen@ 5 per cent of weight of mix</b>	tonne	22.500	48810.00	1098225.00	M-074

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>ii) Aggregate</b>					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 22.5 tonnes					
		Weight of aggregate = 450 -22.50 = 427.50 tonnes					
		<b>Taking density of aggregate = 1.5 ton/cum</b>					
		Volume of aggregate = 285 cum					
		<b>* Grading - I-19 mm (Nominal Size)</b>					
		20 - 10 mm 35 per cent	cum	99.750	1400.00	139650.00	M-045
		10 - 5 mm 23 per cent	cum	65.550	1750.00	114712.50	M-040
		5 mm and below 40 per cent	cum	114.000	1640.00	186960.00	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	11550.00	99561.00	M-188
		or					
		<b>Grading - II-13 mm (Nominal Size)</b>					
		13.2 - 10 mm 30 per cent	cum	85.500	1338.00	114399.00	M-044
		10 - 5 mm 25 per cent	cum	71.250	1750.00	124687.50	M-040
		5 mm and below 43 per cent	cum	122.550	1640.00	200982.00	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	11550.00	99561.00	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 @ 10 % on (a+b+c)</b>				179877.33	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				197865.06	
		Cost for 205 cum = a+b+c+d+e				2176515.69	
		<b>Rate per cum = (a+b+c+d+e)/191</b>				11395.37	
						<b>say 11395.00</b>	
5.8		<b>(ii) for Grading-II(10 mm nominal size)</b>					
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				179751.93	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				197727.12	
		Cost for 205 cum = a+b+c+d+e				2174998.35	
		<b>Rate per cum = (a+b+c+d+e)/191 (For Grading-II)</b>				11387.43	
						<b>say 11387.00</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 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a factor of 0.65					
		2.Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
		4. In case BC is laid over freshly laid tack coat, provision of mechanical broom and 2 mazdoors shall be deleted as the same has been included in the cost of tack coat.					
		5. The individual density for each size of aggregates to be used for construction i.e. 37.5-25 mm, 25-10 mm etc. should be found in the laboratory and accordingly the quantities should be ammended for use in field. The average density of 1.5 tonne/cum is only a reference density in this Data Book.					
		6. The individual percentage of aggregates should be calculated from the total weight of dry aggregates i.e.. excluding the weight of bitumen. The weight of filler will also be 2 per cent by weight of dry aggregates.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.9	510	<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>Unit = sqm</b>					
		<b>Taking output = 9000 sqm</b>					
	<b>Case - I</b>	<b>:-19 mm nominal chipping size</b>					
		<b>a) Labour</b>					
		Mate	day	0.440	300.00	132.00	L-12
		Mazdoor	day	9.000	250.00	2250.00	L-13
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	389.00	2800.80	P&M-031
		Air compressor 250 cfm	hour	7.200	516.00	3715.20	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	2880.00	17280.00	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	609.00	3654.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Bitumen pressure distributor	hour	6.000	1174.00	7044.00	P&M-004
		Smooth wheeled roller 8-10 tonne weight	hour	6.000	504.00	3024.00	P&M-044
		<b>c) Material</b>					
		Bitumen@ 1.20 kg per sqm	tonne	10.800	48810.00	527148.00	M-074
		Crushed stone chipping, 19 mm nominal size @ 0.015 cum per sqm	cum	135.000	1600.00	216000.00	M-053
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				79136.60	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				87050.26	
		Cost for 9000 sqm = a+b+c+d+e				957552.86	
		<b>Rate per sqm = (a+b+c+d+e)/9000</b>				106.39	
					<b>say</b>	<b>106.00</b>	
5.9	<b>Case - II</b>	<b>13 mm nominal size chipping</b>					
		<b>a) Labour</b>					
		Mate	day	0.440	300.00	132.00	L-12
		Mazdoor	day	9.000	250.00	2250.00	L-13
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	389.00	2800.80	P&M-031
		Air compressor 250 cfm	hour	7.200	516.00	3715.20	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	2880.00	17280.00	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	609.00	3654.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1174.00	7044.00	P&M-004
		Three wheel 80-100 kN Statis Roller	hour	6.000	658.00	3948.00	P&M-059
		<b>c) Material</b>					
		Bitumen@ 1.00 kg per sqm	tonne	9.000	48810.00	439290.00	M-074
		Crushed stone chipping, 13 mm nominal size @ 0.01 cum per sqm	cum	90.000	1700.00	153000.00	M-052

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 10 % on (a+b+c)				64143.20	
		e) Contractor's profit @ 10 % on (a+b+c+d)				70557.52	
		Cost for 9000 sqm = a+b+c+d+e				776132.72	
		Rate per sqm = (a+b+c+d+e)/9000				86.24	
					say	<u>86.00</u>	
		<b>Note</b> 1.Where the proposed aggregate fails to pass the stripping test, an approved adhesion agent may be added to the binder as per clause 510.2.4. Alternatively, chips may be pre-coated as per clause 510.2.5					
		2.Input for the second coat, where required, will be the same as per the 1st coat mentioned above					
5.10	511	<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.					
		<b>Unit = sqm</b>					
		<b>Taking output = 10250 sqm (205 cum)</b>					
		(i) <b>Case - I: Mechanical method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour .</b>					
		a) <b>Labour</b>					
		Mate	day	0.840	300.00	252.00	L-12
		Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	250.00	4000.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	400.00	2000.00	L-15
		b) <b>Machinery</b>					
		i) Batch type HMP 75 tonne per hour	hour	6.000	25579.00	153474.00	P&M-021
		ii) Electric Generator Set 250 KVA	hour	6.000	908.00	5448.00	P&M-081
		iii) Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		iv) Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		v) Paver finisher hydrostatic with sensor attachment	hour	6.000	2923.00	17538.00	P&M-034
		iv) Smooth wheeled/tandem roller 8-10 tonnes weight	hour	6.000	1250.00	7500.00	P&M-045
		c) <b>Material</b>					
		Bitumen@ 14.60 kg per 10 sqm	tonne	14.970	48810.00	730685.70	M-074
		Crushed stone chipping, 13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	276.750	1500.00	415125.00	M-043
		d) Overhead charges @ 10 % on (a+b+c)				134354.07	
		e) Contractor's profit @ 10 % on (a+b+c+d)				147789.48	
		Cost for 10250 sqm = a+b+c+d+e				1625684.25	
		Rate per sqm = (a+b+c+d+e)/10250				158.60	
					say	<u>159.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Note</b> If a premix sand seal coat of 'B' type is proposed, the same is required to be provided over the open graded premix carpet immediately on the same day. As the same HMP and other machines will be used for laying of premix sand seal coat, out of 6 effective working hours, 4.00 hours may be utilised for laying of premix carpet and balance 2.00 hours for the seal coat. The rate for the premix sand seal coat under clause 513 (case II) has been worked out accordingly by utilising the HMP for 2.00 hours for the purpose of seal coat. In case type 'A' seal coat is proposed, HMP can be worked for six hours for the premix carpet as type 'A' seal coat does not require the use of HMP.					
5.10		(ii) <b>Case - II: Open-Graded Premix Surfacing using cationic Bitumen Emulsion</b>					
		<b>Unit = sqm</b>					
		<b>Taking output = 900 sqm (24.3 cum)</b>					
		<b>a) Labour</b>					
		Mate	day	0.800	300.00	240.00	L-12
		Mazdoor	day	18.000	250.00	4500.00	L-13
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		<b>b) Machinery</b>					
		Concrete mixer 0.4/0.28 cum capacity	hour	6.000	242.00	1452.00	P&M-009
		Smooth wheeled steel roller 8-10 tonne	hour	6.000	504.00	3024.00	P&M-044
		<b>c) Material</b>					
		Cationic Bitumen Emulsion @ 21.50 kg per 10 sqm	tonne	1.940	39586.00	76796.84	M-073
		Crushed stone aggregates 13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	24.300	1500.00	36450.00	M-043
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				12326.28	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				13558.91	
		Cost for 900 sqm = a+b+c+d+e				149148.04	
		<b>Rate per sqm = (a+b+c+d+e)/900</b>				165.72	
					<b>say</b>	<b>166.00</b>	
5.11	512	<b>Close Graded Premix Surfacing/Mixed Seal Surfacing</b>					
		<b>Case I</b> Mechanical means using HMP of appropriate capacity not less than 75 tonnes/hour.					
		Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.09 mm (Type-a) or 13.2 mm to 0.09 mm (Type-b) aggregates using penetration grade bitumen to the required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a Smooth wheeled roller 8-10 tonne capacity, and finishing to required level and grade.					
		<b>Unit = sqm</b>					
		<b>Taking output = 10250 sqm (205 cum)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	300.00	252.00	L-12
		Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	250.00	4000.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	400.00	2000.00	L-15
		<b>b) Machinery</b>					
		i) HMP of appropriate capacity.	hour	6.000	25579.00	153474.00	P&M-021
		ii) Electric Generator Set 250 KVA	hour	6.000	908.00	5448.00	P&M-081
		iii) Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		iv) Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		v) Paver finisher hydrostatic with sensor attachment	hour	6.000	2923.00	17538.00	P&M-034
		iv) Smooth wheeled 8-10 tonnes weight	hour	6.000	504.00	3024.00	P&M-044

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Material</b>					
		<b>Type - A</b>					
		* Bitumen@ 22 kg per 10 sqm	tonne	22.500	48810.00	1098225.00	M-074
		Stone crushed aggregates 11.2 mm to 0.09 @ 0.27 cum per 10 sqm	cum	276.750	950.00	262912.50	M-041
		or					
		<b>Type - B</b>					
		Bitumen @ 19 kg per 10 sqm	tonne	19.480	48810.00	950818.80	M-074
		Stone crushed aggregates 13.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	276.750	815.00	225551.25	M-042
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				155439.15	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				170983.07	
		Cost for 10250 sqm = a+b+c+d+e				1880813.72	
		<b>Rate per sqm = (a+b+c+d+e)/10250</b>				183.49	
					<b>say</b>	<b>183.00</b>	
		* Any one of the alternative may be adopted					
5.12	513	<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					
		<b>Unit = sqm</b>					
		<b>Taking output = 10250 sqm (92.25 cum)</b>					
		<b>(i) Case - I : Type A</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	300.00	72.00	L-12
		Mazdoor	day	6.000	250.00	1500.00	L-13
		<b>b) Machinery</b>					
		Hydraulic self propelled chip spreader	hour	6.000	2880.00	17280.00	P&M-025
		Tipper 5.5 cum capacity	hour	6.000	609.00	3654.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1174.00	7044.00	P&M-004
		Smooth wheeled roller 8 -10 tonne weight	hour	6.000	504.00	3024.00	P&M-044
		<b>c) Material</b>					
		Bitumen@ 9.80 kg per 10 sqm	tonne	10.050	48810.00	490540.50	M-074
		Crushed stone chipping of 6.7 mm size defined as 100 per cent passing 11.2 mm sieve and retained on 2.36 mm sieve applied @ 0.09 cum per 10 sqm	cum	92.250	1740.00	160515.00	M-050
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				69114.75	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				76026.23	
		Cost for 10250 sqm = a+b+c+d+e				836288.48	
		<b>Rate per sqm = (a+b+c+d+e)/10250</b>				81.59	
					<b>say</b>	<b>82.00</b>	
		<b>Note</b>					
		Since seal coat is provided immediately over the bituminous layers, mechanical broom for clearing has not been catered.					
5.12		<b>(ii) Case - II : Type B</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>Unit = sqm</b>					
		<b>Taking output = 7858 sqm (47.16 cum)</b>					
		<b>a) Labour</b>					
		Mate	day	0.160	300.00	48.00	L-12
		Mazdoor	day	4.000	250.00	1000.00	L-13
		<b>b) Machinery</b>					
		HMP of 75 tonnes/hour.	hour	2.000	18917.00	37834.00	P&M-022
		Electric Generator Set 250 KVA	hour	2.000	908.00	1816.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	2.000	1253.00	2506.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	104 x 'L'	24.00	0.00	Lead =0 km & P&M-058

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Paver finisher hydrostatic with sensor attachment	hour	2.000	2923.00	5846.00	P&M-034
		Smooth wheeled 8-10 tonnes capacity	hour	2.000	504.00	1008.00	P&M-044
		<b>c) Material</b>					
		Bitumen@ 6.80 kg per 10 sqm	tonne	5.340	48810.00	260645.40	M-074
		Crushed stone chipping of 6.7 mm size defined as passing 11.2 mm sieve and retained on 2.36 mm sieve applied @ 0.06 cum per 10 sqm	cum	47.160	1740.00	82058.40	M-050
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				39276.18	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				43203.80	
		Cost for 7858 sqm = a+b+c+d+e				475241.78	
		<b>Rate per sqm = (a+b+c+d+e)/7858</b>				60.48	
					<b>say</b>	<b>60.00</b>	
		<b>Note</b>					
		Since seal coat is required to be provided over the premix carpet on the same day, out of the 6 working hours of the HMP, 4.00 hours are proposed to be utilised for the premix carpet and the balance 2.00 hours for the seal coat. Hence 2.00 hours have been considered for this case. This may be linked to rate analysis worked out under clause 511.					
<b>5.14</b>	<b>515</b>	<b>Mastic Asphalt</b>					
		Providing and laying 25 mm thick mastic asphalt wearing course with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated finegrained hard stone chipping of 13.2 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces is not less than 1000C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.					
		<b>Unit = sqm</b>					
		<b>Taking output = 35.00 sqm (0.87 cum ) assuming a density of 2.3 tonnes/cum.-2 tonnes</b>					
		<b>a) Labour</b>					
		Mate	day	0.440	300.00	132.00	L-12
		Mazdoor	day	10.000	250.00	2500.00	L-13
		Mazdoor skilled	day	1.000	400.00	400.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	0.060	389.00	23.34	P&M-031
		Air compressor 250 cfm	hour	0.060	516.00	30.96	P&M-001
		Mastic cooker 1 tonne capacity	hour	6.000	68.00	408.00	P&M-030
		Bitumen boiler 1500 litres capacity	hour	6.000	217.00	1302.00	P&M-005
		Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.000	427.00	427.00	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	48810.00	9957.24	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	560.00	218.40	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	11550.00	4158.00	M-188

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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	1500.00	825.00	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	1045.00	18.81	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	49.00	24.50	M-074
		d) Overhead charges @ 10 % on (a+b+c)				2042.53	
		e) Contractor's profit @ 10 % on (a+b+c+d)				2246.78	
		Cost for 35.00 sqm = a+b+c+d+e				24714.55	
		Rate per sqm = (a+b+c+d+e)/35				706.13	
					say	<u>706.00</u>	
		<b>Note</b>					
		1.The rates for 50 mm & 40 mm thick layers may be worked out on pro-rata basis.					
		2.Where tack coat is required to be provided before laying mastic asphalt, the same is required to be measured and paid separately.					
		3.The quantities of binder, filler and aggregates are for estimating purpose. Exact quantities shall be as per mix design.					
		4.This rate analysis is based on design made by CRRRI for a specific case and is meant for estimating purposes only. Actual design is required to be done for each case.					
5.15	516	<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>					
		<b>Unit = sqm</b>					
		<b>Taking output = 16000 sqm (80 cum)</b>					
		<b>Taking density of 2.2 tonnes per cum</b>					
		weight of mix = 176 tonnes					
		<b>a) Labour</b>					
		Mate	day	0.240	300.00	72.00	L-12
		Mazdoor	day	6.000	250.00	1500.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom	hour	6.000	389.00	2334.00	P&M-031
		Air compressor 250 cfm	hour	6.000	516.00	3096.00	P&M-001
		Mobile slurry seal equipment	hour	6.000	1101.00	6606.00	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler.	hour	6.000	609.00	3654.00	P&M-048
		Pneumatic tyred roller with individual wheel load not exceeding 1.5 tonnes	hour	6.000	1359.00	8154.00	P&M-037
		Water tanker 6 KL capacity	hour	2.000	488.00	976.00	P&M-060
		<b>c) Material</b>					
		Residual Binder @ 11 per cent of mix $80 \times 2.2 \times 0.11$	tonne	19.360	39586.00	766384.96	M-077
		Fine aggregate 4.75 mm and below 87 per cent of total mix, $80 \times 2.2 \times 0.87 = 153.12$ tonnes. Taking density 1.5, = $153.12/1.5 = 102.08$ cum	cum	102.080	1640.00	167411.20	M-030
		Filler @ 2 per cent of total mix = $80 \times 2.2 \times 0.02$	tonne	3.520	11550.00	40656.00	M-188
		Cost of water	KL	12.000	60.00	720.00	M-189
		d) Overhead charges @ 10 % on (a+b+c)				100908.22	
		e) Contractor's profit @ 10 % on (a+b+c+d)				110999.04	
		Cost for 16000 sqm = a+b+c+d+e				1220989.41	
		Rate per sqm = (a+b+c+d+e)/16000				76.31	
					say	<u>76.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.15		(ii)	3 mm thickness					
			<i>Unit = sqm</i>					
			<i>Taking output = 20000 sqm (60 cum)</i>					
			<b>a) Labour</b>					
			Mate	day	0.200	300.00	60.00	L-12
			Mazdoor	day	5.000	250.00	1250.00	L-13
			<b>b) Machinery</b>					
			Mechanical broom	hour	6.000	389.00	2334.00	P&M-031
			Air compressor 250 cfm	hour	6.000	516.00	3096.00	P&M-001
			Mobile slurry seal equipment	hour	6.000	1101.00	6606.00	P&M-033
			Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
			Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler	hour	6.000	609.00	3654.00	P&M-048
			Water tanker 6 KL capacity	hour	2.000	488.00	976.00	P&M-060
			<b>c) Material</b>					
			Residual Binder @ 13 per cent of mix = 60 x 2.2 x 0.13	tonne	17.160	39586.00	679295.76	M-077
			Fine aggregate 3 mm and below 85 per cent of total mix, 60x 2.2 x 0.85 = 112.2 tonnes. Taking density 1.5,	cum	74.800	560.00	41888.00	M-022
			Filler @ 2 per cent of total mix = 60x 2.2 x 0.02	tonne	2.640	11550.00	30492.00	M-188
			Cost of water	KL	12.000	60.00	720.00	M-189
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				77788.98	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				85567.87	
			Cost for 30000 sqm = a+b+c+d+e				941246.61	
			<b>Rate per sqm = (a+b+c+d+e)/20000</b>				47.06	
						<b>say</b>	<b>47.00</b>	
5.15		(iii)	1.5 mm thickness					
			<i>Unit = sqm</i>					
			<i>Taking output = 24000 sqm (36 cum)</i>					
			<b>a) Labour</b>					
			Mate	day	0.200	300.00	60.00	L-12
			Mazdoor	day	5.000	250.00	1250.00	L-13
			<b>b) Machinery</b>					
			Mechanical broom	hour	6.000	389.00	2334.00	P&M-031
			Air compressor 250 cfm	hour	6.000	516.00	3096.00	P&M-001
			Mobile slurry seal equipment	hour	6.000	1101.00	6606.00	P&M-033
			Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
			Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler.	hour	6.000	609.00	3654.00	P&M-048
			Water tanker 6 KL capacity	hour	2.000	488.00	976.00	P&M-060
			<b>c) Material</b>					
			Residual Binder @ 16 per cent of mix, 36 x 2.2 x 0.16	tonne	12.670	39586.00	501554.62	M-077
			Fine aggregate 2.36 mm and below, 82 per cent of total mix, 36x 2.2 x 0.82 = 64.94 tonnes. Taking density 1.5	cum	43.300	560.00	24248.00	M-022
			Filler @ 2 per cent of total mix = 36x 2.2 x 0.02	tonne	1.580	11550.00	18249.00	M-188
			Cost of water	KL	12.000	60.00	720.00	M-189
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				57026.56	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				62729.22	
			Cost for 24000 sqm = a+b+c+d+e				690021.40	
			<b>Rate per sqm = (a+b+c+d+e)/24000</b>				28.75	
						<b>say</b>	<b>29.00</b>	
		<b>Note</b>	1. Tack coat, if required to be provided, before laying slurry seal may be measured and paid separately					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.17	518	<b>Fog Spray</b>					
		Providing and applying low viscosity bitumen emulsion for sealing cracks less than 3 mm wide or incipient fretting or disintegration in an existing bituminous surfacing.					
		<b>Unit = sqm</b>					
		<b>Taking output = 10500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	300.00	36.00	L-12
		Mazdoor	day	3.000	250.00	750.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	389.00	2334.00	P&M-031
		Air compressor 250 cfm	hour	6.000	516.00	3096.00	P&M-001
		Bitumen emulsion pressure distributor @ 1750 sqm per hour	tonne	6.000	1174.00	7044.00	P&M-004
		<b>c) Material</b>					
		Bitumen emulsion @ 0.75 kg per sqm	tonne	7.880	39586.00	311937.68	M-077
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				32519.77	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				35771.74	
		Cost for 10500 sqm = a+b+c+d+e				393489.19	
		<b>Rate per sqm = (a+b+c+d+e)/10500</b>				37.48	
						<b>say</b>	<b>37.00</b>
		1.In case it is decided by the engineer to blind the fog spray, the following may be added					
		<b>a) Labour</b>					
		Mate	day	0.160	300.00	48.00	L-12
		Mazdoor for precoating of grit	day	4.000	250.00	1000.00	L-13
		<b>b) Material</b>					
		Crushed stone grit 3 mm size @ 3.75 kg per sqm	cum	26.250	600.00	15750.00	M-024
		Bitumen emulsion for precoating grit @ 2 per cent of grit, 39.38 x 0.02	tonne	0.790	39586.00	31272.94	M-077
						48070.94	
						4.58	
						<b>say</b>	<b>5.00</b>
5.18	519	<b>Bituminous Cold Mix ( Including Gravel Emulsion)</b>					
		Providing, laying and rolling of bituminous cold mix on prepared base consisting of a mixture of unheated mineral aggregate and emulsified or cutback bitumen, including mixing in a plant of suitable type and capacity, transporting, laying, compacting and finishing to specified grades and levels.					
		<b>Unit = cum</b>					
		<b>Taking output = 205 cum (450 tonne)</b>					
		<b>(i) Using bitumen emulsion and 9.5 mm or 13.2 mm size aggregate</b>					
		<b>Composition of mix (450 tonne) is assumed to be as under:-</b>					
		Bitumen Emulsion 8 per cent	By weight of total mix				
		Filler 2 per cent					
		Total aggregates 90 per cent					
		<b>Proportion of aggregates</b>					
		19 mm to 9.5 mm 25 per cent					
		9.5 mm to 6 mm 29 per cent					
		6 mm to 0.075 mm 36 per cent					
		<b>a) Labour</b>					
		Mate	day	0.840	300.00	252.00	L-12
		Mazdoor	day	16.000	250.00	4000.00	L-13
		Mazdoor skilled	day	5.000	400.00	2000.00	L-15

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Drum mix plant for cold mixes of appropriate capacity but not less than 75 tonnes/hour.	hour	6.000	363.00	2178.00	P&M-077
		Electric generator 125 KVA	hour	6.000	787.00	4722.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Paver finisher	hour	6.000	2923.00	17538.00	P&M-034
		Pneumatic tyred roller 12-15 tonnes	hour	6.00x0.65*	1359.00	5300.10	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	1250.00	4875.00	P&M-045
		<b>c) Material</b>					
		Bitumen emulsion @ 8 per cent	tonne	36.000	39586.00	1425096.00	M-077
		Filler (lime)@ 2 per cent	tonne	9.000	11550.00	103950.00	M-188
		Aggregates size 19 to 9.5 mm - 450 x 0.25 x 1/1.5	cum	75.000	1400.00	105000.00	M-045
		Aggregates size 9.5 to 6 mm - 450 x 0.29 x 1/1.5	cum	87.000	1750.00	152250.00	M-040
		Aggregates size 6 to 0.075 mm - 450 x 0.36 x 1/1.5	cum	108.000	1640.00	177120.00	M-030
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				201179.91	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				221297.90	
		Cost for 205 cum = a+b+c+d+e				2434276.91	
		<b>Rate per cum = (a+b+c+d+e)/205</b>				11874.52	
					<b>say</b>	<b>11875.00</b>	
		<b>(Applicable to cases I to IV)</b>					
	<b>Note</b>	1.Density of aggregates has been assumed 1.5 gms/cc					
		2. Tack coat where provided will be measured and paid separately.					
		*3. Though the rollers are required only for 3.5 hours each as per norms of output, but these are required to be available at site for 6 hours as the drum mix plant and the paver would take 6 hours for mixing and paving. To cater for the idle period, their usage rates have been multiplied by a factor of 0.65					
5.18	(ii)	<b>Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate</b>					
		<b>Composition of mix</b> (450 tonne) is assumed to be as under:-					
		Bitumen Emulsion 8 per cent					
		Filler 2 per cent					
		Total aggregates 90 per cent					
		<b>Proportion of aggregates</b>					
		37.5 mm to 19 mm 25 per cent					
		19 mm to 6 mm 30 per cent					
		6 mm to 0.075 mm 35 per cent					
		<b>a) Labour</b>					
		Mate	day	0.840	300.00	252.00	L-12
		Mazdoor	day	16.000	250.00	4000.00	L-13
		Mazdoor skilled	day	5.000	400.00	2000.00	L-15
		<b>b) Machinery</b>					
		Drum mix plant for cold mixes 60-90 tonne per hour producing average output of 75 tonnes per hour	hour	6.000	363.00	2178.00	P&M-077
		Electric generator 125 KVA	hour	6.000	787.00	4722.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Paver finisher	hour	6.000	2923.00	17538.00	P&M-034
		Pneumatic tyred roller 12-15 tonnes	hour	6.00x0.65*	1359.00	5300.10	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	1250.00	4875.00	P&M-045

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Material</b>					
		Bitumen emulsion @ 8 per cent	tonne	36.000	39586.00	1425096.00	M-077
		Filler (lime)@ 2 per cent	tonne	9.000	11550.00	103950.00	M-188
		Aggregates size 37.5 to 19 mm - 450 x 0.25 x 1/1.5	cum	75.000	950.00	71250.00	M-048
		Aggregates size 19 to 6 mm - 450 x 0.3 x 1/1.5	cum	90.000	1465.00	131850.00	M-047
		Aggregates size 6 to 0.075 mm - 450 x 0.35 x 1/1.5	cum	105.000	1640.00	172200.00	M-030
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				195272.91	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				214800.20	
		Cost for 205 cum = a+b+c+d+e				2362802.21	
		<b>Rate per cum = (a+b+c+d+e)/205</b>				11525.86	
					<b>say</b>	<b><u>11526.00</u></b>	
		<b>Note</b>					
		1. Density of aggregates has been assumed 1.5 gms/cc					
		2. Tack coat where provided will be measured and paid separately.					
		*3. Though the rollers are required only for 3.5 hours each as per norms of output, but these are required to be available at site for 6 hours as the drum mix plant and the paver would take 6 hours for mixing and paving. To cater for the idle period, their usage rates have been multiplied by a factor of 0.65					
5.18	(iii)	<b>Using cutback bitumen and 9.5 mm or 13.2 mm nominal size aggregate</b>					
		<b>Composition of mix</b> (450 tonne) is assumed to be as under:-					
		Cutback bitumen 5 per cent					
		Filler (lime) 2 per cent					
		Total aggregates 93 per cent					
		<b>Proportion of aggregates</b>					
		19 mm to 9.5 mm 26 per cent					
		9.5 mm to 6 mm 31 per cent					
		6 mm to 0.075 mm 36 per cent					
		<b>a) Labour</b>					
		Mate	day	0.840	300.00	252.00	L-12
		Mazdoor	day	16.000	250.00	4000.00	L-13
		Mazdoor skilled	day	5.000	400.00	2000.00	L-15
		<b>b) Machinery</b>					
		Drum mix plant for cold mixes 60-90 tonne per hour producing average output of 75 tonnes per hour	hour	6.000	363.00	2178.00	P&M-077
		Electric generator 125 KVA	hour	6.000	787.00	4722.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Paver finisher	hour	6.000	2923.00	17538.00	P&M-034
		Pneumatic tyred roller 12-15 tonnes	hour	6.00x0.65*	1359.00	5300.10	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	1250.00	4875.00	P&M-045
		<b>c) Material</b>					
		Cutback bitumen @ 5 per cent	tonne	22.500	52367.00	1178257.50	M-076
		Filler (lime)@ 2 per cent	tonne	9.000	11550.00	103950.00	M-188
		Aggregates size 19 to 9.5 mm - 450 x 0.26 x 1/1.5	cum	78.000	1400.00	109200.00	M-045
		Aggregates size 9.5 to 6 mm - 450 x 0.31 x 1/1.5	cum	93.000	1750.00	162750.00	M-040
		Aggregates size 6 to 0.075 mm - 450 x 0.36 x 1/1.5	cum	108.000	1640.00	177120.00	M-030
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				177966.06	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				195762.67	
		Cost for 205 cum = a+b+c+d+e				2153389.33	
		<b>Rate per cum = (a+b+c+d+e)/205</b>				10504.34	
					<b>say</b>	<b><u>10504.00</u></b>	
	<b>Note</b>	1.Density of aggregates has been assumed 1.5 gms/cc					
		2. Tack coat where provided will be measured and paid separately.					
		*3. Though the rollers are required only for 3.5 hours each as per norms of output, but these are required to be available at site for 6 hours as the drum mix plant and the paver would take 6 hours for mixing and paving. To cater for the idle period, their usage rates have been multiplied by a factor of 0.65					
5.18	(iv)	<b>Using cutback bitumen and 19 mm or 26.5 mm nominal size aggregate</b>					
		<b>Composition of mix</b> (450 tonne) is assumed to be as under:-					
		Cutback bitumen 5 per cent					
		Filler 2 per cent					
		Total aggregates 93 per cent					
		<b>Proportion of aggregates</b>					
		37.5 mm to 19 mm 25 per cent					
		19 mm to 6 mm 30 per cent					
		6 mm to 0.075 mm 38 per cent					
		<b>a) Labour</b>					
		Mate	day	0.840	300.00	252.00	L-12
		Mazdoor	day	16.000	250.00	4000.00	L-13
		Mazdoor skilled	day	5.000	400.00	2000.00	L-15
		<b>b) Machinery</b>					
		Drum mix plant for cold mixes 60-90 tonne per hour producing output of 75 tonnes per hour	hour	6.000	363.00	2178.00	P&M-077
		Electric generator 125 KVA	hour	6.000	787.00	4722.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Paver finisher	hour	6.000	2923.00	17538.00	P&M-034
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1359.00	5300.10	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	1250.00	4875.00	P&M-045
		<b>c) Material</b>					
		Cutback bitumen on @ 5 per cent	tonne	22.500	52367.00	1178257.50	M-076
		Filler (lime)@ 2 per cent	tonne	9.000	11550.00	103950.00	M-188
		Aggregates size 37.5 to 19 mm - 450 x 0.25 x 1/1.5	cum	75.000	950.00	71250.00	M-048
		Aggregates size 19 to 6 mm - 450 x 0.3 x 1/1.5	cum	90.000	1465.00	131850.00	M-047
		Aggregates size 6 to 0.075 mm - 450 x 0.38 x 1/1.5	cum	114.000	1640.00	186960.00	M-030
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				172065.06	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				189271.57	
		Cost for 205 cum = a+b+c+d+e				2081987.23	
		<b>Rate per cum = (a+b+c+d+e)/205</b>				10156.04	
					<b>say</b>	<b><u>10156.00</u></b>	
	<b>Note</b>	1.Density of aggregates has been assumed 1.5 gms/cc					
		2. Tack coat where provided will be measured and paid separately.					
		*3. Though the rollers are required only for 3.5 hours each as per norms of output, but these are required to be available at site for 6 hours as the drum mix plant and the paver would take 6 hours for mixing and paving. To cater for the idle period, their usage rates have been multiplied by a factor of 0.65					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.19	520	<b>Sand Asphalt Base Course</b>					
		Providing, laying and rolling sand-asphalt base course composed of sand, mineral filler and bituminous binder on a prepared sub-grade or sub-base to the lines, levels, grades and cross sections as per the drawings including mixing in a plant of suitable type and capacity, transporting, laying, compacting and finishing.					
		<b>Unit = cum</b>					
		<b>Taking output = 205 cum (450 tonne)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	300.00	252.00	L-12
		Mazdoor	day	16.000	250.00	4000.00	L-13
		Mazdoor skilled	day	5.000	400.00	2000.00	L-15
		<b>b) Machinery</b>					
		Hot Mix Plant of appropriate capacity but not less than 75 tonnes/hour	hour	6.000	15127.00	90762.00	P&M-023
		Electric generator set 250 KVA	hour	6.000	908.00	5448.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Paver finisher	hour	6.000	2923.00	17538.00	P&M-034
		smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65	504.00	1965.60	P&M-044
		Three wheel 80-100 kN Statis Roller	hour	6.00x0.65	658.00	2566.20	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem rollers.	hour	6.00x0.65	1250.00	4875.00	P&M-045
		<b>c) Material</b>					
		<b>Composition of mix (450 tonne) is assumed to be as under:-</b>					
		Density 2.20 tonne per cum					
		Weight 450 tonne					
		Bitumen 5 per cent					
		Filler 2 per cent					
		Sand of size 4.75 to 0.075 mm 93 per cent					
		Bitumen @ 5 per cent	tonne	22.500	48810.00	1098225.00	M-074
		Filler (lime) @ 2 per cent	tonne	9.000	11550.00	103950.00	M-188
		Sand of size 4.75 to 0.075 mm - 450 x 0.93 x 1/1.5	cum	288.620	540.00	155854.80	M-004
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				149495.46	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				164445.01	
		Cost for 205 cum = a+b+c+d+e				1808895.07	
		<b>Rate per cum = (a+b+c+d+e)/205</b>				8823.88	
					<b>say</b>	<b>8824.00</b>	
		<b>Note</b>					
		1. Tack coat will be measured and paid separately					
		2. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of this roller, their usage rates has been multiplied by a factor of 0.65					
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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<i>Unit = sqm</i>					
		<i>Taking output = 10500 sqm</i>					
		<b>a) Labour</b>					
		Mate	day	0.240	300.00	72.00	L-12
		Mazdoor	day	6.000	250.00	1500.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	389.00	2334.00	P&M-031
		Air compressor 250 cfm	hour	6.000	516.00	3096.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1174.00	7044.00	P&M-004
		Hydraulic Chip spreader	hour	6.000	2880.00	17280.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	504.00	3024.00	P&M-044
		<b>c) Material</b>					
		Modified binder	tonne	9.450	44379.00	419381.55	M-078
		Crushed stone aggregates 5.6 mm size	cum	105.000	1740.00	182700.00	M-050
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				63643.16	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				70007.47	
		Cost for 10500 sqm = a+b+c+d+e				770082.18	
		<b>Rate per sqm = (a+b+c+d+e)/10500</b>				73.34	
					<b>say</b>	<b>73.00</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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 10500 sqm</i>					
		<b>a) Labour</b>					
		Mate	day	0.240	300.00	72.00	L-12
		Mazdoor	day	6.000	250.00	1500.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	389.00	2334.00	P&M-031
		Air compressor 250 cfm capacity	hour	6.000	516.00	3096.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1174.00	7044.00	P&M-004
		Hydraulic Chip spreader	hour	6.000	2880.00	17280.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	504.00	3024.00	P&M-044
		<b>c) Material</b>					
		Modified binder	tonne	11.550	44379.00	512577.45	M-078
		Crushed stone chipping 11.2 mm size	cum	105.000	1750.00	183750.00	M-051
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				73067.75	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				80374.52	
		Cost for 10500 sqm = a+b+c+d+e				884119.71	
		<b>Rate per sqm = (a+b+c+d+e)/10500</b>				84.20	
					<b>say</b>	<b>84.00</b>	
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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = sqm</b>					
		<b>Taking output = 10500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	300.00	72.00	L-12
		Mazdoor	day	6.000	250.00	1500.00	L-13
		Mazdoor skilled	day	2.000	400.00	800.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	389.00	2334.00	P&M-031
		Air compressor 250 cfm capacity	hour	6.000	516.00	3096.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1174.00	7044.00	P&M-004
		Hydraulic Chip spreader	hour	6.000	2880.00	17280.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	504.00	3024.00	P&M-044
		<b>c) Material</b>					
		Modified binder	tonne	15.750	44379.00	698969.25	M-078
		Crushed stone aggregates 11.2 mm size	cum	126.000	1750.00	220500.00	M-051
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				95461.93	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				105008.12	
		Cost for 10500 sqm = a+b+c+d+e				1155089.29	
		<b>Rate per sqm = (a+b+c+d+e)/10500</b>				110.01	
					<b>say</b>	<b>110.00</b>	
		<b>Note</b>					In case 2nd coat is also required to be provided, material provided for the 2nd coat shall be as per table 500-47.
5.22	519.3	<b>Recipe Cold Mix</b>					
		Providing and laying of premix of crushed stone aggregates and emulsion binder, mixed in a batch type cold mixing plant, laid over prepared surface, by paver finisher, rolled with a pneumatic tyred roller initially and finished with a smooth steel wheel roller, all as per clause 519.3					
		<b>Unit = cum</b>					
		<b>Taking output = 205 cum (450 tonnes)</b>					
		<b>(i) 75 mm thickness</b>					
		<b>a) Labour</b>					
		Mate	day	1.000	300.00	300.00	L-12
		Mazdoor	day	12.000	250.00	3000.00	L-13
		Mazdoor skilled	day	5.000	400.00	2000.00	L-15
		<b>b) Machinery</b>					
		Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour	hour	6.000	18755.00	112530.00	P&M-064
		Electric generator 125 KVA	hour	6.000	787.00	4722.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1253.00	7518.00	P&M-017
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2923.00	17538.00	P&M-034
		Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1359.00	5300.10	P&M-037
		Smooth wheeled steel roller 6-8 tonnes.	hour	6.00x0.65*	504.00	1965.60	P&M-044
		Water tanker 6 KL capacity	hour	1.000	488.00	488.00	P&M-060
		<b>c) Material</b>					
		Bitumen emulsion @ 45 litres per tonne	tonne	20.250	39586.00	801616.50	M-077
		Crushed stone aggregates 40 mm nominal size	cum	297.000	1250.00	371250.00	M-055
		Cost of water	KL	6.000	60.00	360.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				132858.82	

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)				146144.70	
		Cost for 10500 sqm = a+b+c+d+e				1607591.72	
		Rate per sqm = (a+b+c+d+e)/205				7841.91	
					say	<u>7842.00</u>	
		<b>Note (Case I to III)</b>					
		1. These mixes are considered suitable for minor repair work and temporary road surface improvement.					
		2. In case concrete mixtures are required to be used for mixing, a number of these will be needed to match the capacity of road rollers.					
		3. Tack coat, where provided, will be measured and paid separately.					
		*4. Both the rollers have to be available at site to match with the output of batch mixing plant and paver finisher. A multiplying factor of 0.65 has been adopted to cater for the idling period of road rollers.					
5.22	(ii)	<b>40 mm thickness</b>					
		a) Labour					
		Mate	day	1.000	300.00	300.00	L-12
		Mazdoor	day	12.000	250.00	3000.00	L-13
		Mazdoor skilled	day	5.000	400.00	2000.00	L-15
		b) Machinery					
		Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour	hour	6.000	18755.00	112530.00	P&M-064
		Electric generator 125 KVA	hour	6.000	787.00	4722.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1253.00	7518.00	P&M-017
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2923.00	17538.00	P&M-034
		Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1359.00	5300.10	P&M-037
		Smooth wheeled steel roller 6-8 tonnes.	hour	6.00x0.65*	504.00	1965.60	P&M-044
		Water tanker 6 KL capacity	hour	1.000	488.00	488.00	P&M-060
		c) Material					
		Bitumen emulsion @ 70 litres per tonne	tonne	31.500	39586.00	1246959.00	M-077
		Crushed stone aggregates 14 mm nominal size	cum	287.000	1700.00	487900.00	M-052
		Cost of water	KL	6.000	60.00	360.00	M-189
		d) Overhead charges @ 10 % on (a+b+c)				189058.07	
		e) Contractor's profit @ 10 % on (a+b+c+d)				207963.88	
		Cost for 10500 sqm = a+b+c+d+e				2287602.65	
		Rate per sqm = (a+b+c+d+e)/205				11159.04	
					say	<u>11159.00</u>	
5.22	(iii)	<b>25 mm thickness</b>					
		a) Labour					
		Mate	day	1.000	300.00	300.00	L-12
		Mazdoor	day	12.000	250.00	3000.00	L-13
		Mazdoor skilled	day	5.000	400.00	2000.00	L-15
		b) Machinery					
		Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour	hour	6.000	18755.00	112530.00	P&M-064
		Electric generator 125 KVA	hour	6.000	787.00	4722.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1253.00	7518.00	P&M-017
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2923.00	17538.00	P&M-034
		Tipper 10 tonne capacity	tonne.km	450 x L	24.00	0.00	Lead =0 km & P&M-058

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Pneumatic tyred roller	hour	6.00x0.65*	1359.00	5300.10	P&M-037
		Smooth wheeled steel roller	hour	6.00x0.65*	504.00	1965.60	P&M-044
		Water tanker 6 KL capacity	hour	1.000	488.00	488.00	P&M-060
		<b>c) Material</b>					
		Bitumen emulsion @ 85 litres per tonne	tonne	38.250	39586.00	1514164.50	M-077
		Crushed stone aggregates 6 mm nominal size	cum	270.000	1740.00	469800.00	M-050
		Cost of water	KL	6.000	60.00	360.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				213968.62	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				235365.48	
		Cost for 10500 sqm = a+b+c+d+e				2589020.30	
		<b>Rate per sqm = (a+b+c+d+e)/205</b>				12629.37	
						<b>say</b>	<b>12629.00</b>

## Chapter – 6

### CEMENT CONCRETE PAVEMENT

#### **Preamble:**

- 1 High capacity batch mix plants of 75 cum/hour (effective output) has been considered in the rate analysis of cement concrete pavement works.
- 2 While tippers have been provided for transportation of dry lean cement concrete and rolled cement concrete, transit truck mixers have been considered for the cement concrete pavement.
- 3 Super plasticizer admixture has been provided to improve workability with reduced water cement ratio.
- 4 Cement 43 grade has been catered for the cement concrete pavement i.e., for pavement quality concrete to get higher strength. However, for dry lean concrete, cement of 33 grade may be preferred.
- 5 While a slip form paver has been catered for the top layer of concrete pavement, a mechanical paver has been provided for dry lead and roller cement concrete.
- 6 Materials provided in the rate analysis are for estimating purpose. Exact quantity of materials be determined for the job mix formula.

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	300.00	336.00	L-12
		Mazdoor skilled	day	6.000	400.00	2400.00	L-15
		Mazdoor	day	22.000	250.00	5500.00	L-13
		<b>b) Machinery</b>					
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017
		Cement concrete batch mix plant @ 75 cum per hour	hour	6.000	4235.00	25410.00	P&M-068
		Electric generator 100 KVA	hour	6.000	762.00	4572.00	P&M-080
		Paver with electronic sensor	hour	6.000	2923.00	17538.00	P&M-034
		Vibratory roller 8-10 t capacity	hour	8.000	658.00	5264.00	P&M-059
		Water tanker 6 KL capacity	hour	8.000	488.00	3904.00	P&M-060
		Tipper	tonne.km	990 x L	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		<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	1625.00	658125.00	M-052 and M-054
		Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete	cum	203.000	540.00	109620.00	M-004
		Cement @ 150 kg/cum of concrete	tonne	67.500	8120.00	548100.00	M-081
		Cost of water	KL	48.000	60.00	2880.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				139116.70	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				153028.37	
		Cost for 205 cum = a+b+c+d+e				1683312.07	
		<b>Rate per cum = (a+b+c+d+e)/450</b>				3740.69	
					<b>say</b>	<b>3741.00</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	300.00	600.00	L-12
		Mazdoor skilled	day	15.000	400.00	6000.00	L-15
		Mazdoor	day	35.000	250.00	8750.00	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Road Sweeper @ 1250 sqm per hour	hour	2.800	389.00	1089.20	P&M-031
		Front end loader 1 cum bucket capacity	hour	18.000	1253.00	22554.00	P&M-017
		Cement concrete batch mix plant @ 175 cum per hour (effective output)	hour	6.000	3170.00	19020.00	P&M-067
		Electric generator 250 KVA	hour	6.000	908.00	5448.00	P&M-081
		Slip form paver with electronic sensor	hour	6.000	2923.00	17538.00	P&M-006
		Water tanker 6 KL capacity	hour	36.000	488.00	17568.00	P&M-060
		Transit truck agitator 5 cum capacity.	tonne.km	2415xL	24.00	0.00	Lead =0 km & P&M-058
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00	
		Concrete joint cutting machine .	hour	12.000	97.00	1164.00	P&M-083
		Texturing machine .	hour	12.000	242.00	2904.00	P&M-088
		<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	1625.00	1535625.00	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	540.00	255420.00	M-004
		Cement 43 grade @ 400 kg/cum of concrete	tonne	414.000	8120.00	3361680.00	M-081
		32 mm mild steel dowel bars of grade S 240	tonne	9.450	53650.00	506992.50	M-126
		16 mm deformed steel tie bars of grade S 415	tonne	1.170	53650.00	62770.50	M-082
		Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	3675.000	27.00	99225.00	M-164
		Pre moulded Joint filler, 25 mm thick for expansion joint.	sqm	16.330	550.00	8981.50	M-141
		Joint sealant	kg	875.000	302.00	264250.00	M-120
		Sealant primer	kg	116.670	121.00	14117.07	M-097
		Plastic sheath, 1.25 mm thick for dowel bars	sqm	46.670	0.90	42.00	M-138
		Curing compound	liter	1850.000	49.00	90650.00	M-090
		Super plastisizer admixture IS marked as per 9103-1999 @ 0.5 per cent by weight of cement	kg	2070.000	55.00	113850.00	M-180
		Cost of water	KL	216.000	60.00	12960.00	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.				63265.64	
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				649246.44	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				714171.08	
		Cost for 1050cum = a+b+c+d+e				7855881.93	
		<b>Rate per cum = (a+b+c+d+e)/1050</b>				7481.79	
						<b>say</b>	<b><u>7482.00</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.
<b>6.3</b>	<b>603</b>	<b>Rolled Cement Concrete Base</b>					
		Construction of rolled cement concrete base course with coarse and fine aggregate conforming to IS:383, the size of coarse aggregate not exceeding 25 mm with minimum, aggregate cement ratio 15:1 and minimum cement content of 200 kg/cum, aggregate gradation to be as per table 600-4 after blending, mixing in batching plant at optimum moisture content, transporting to site, laying with a paver with electronic sensor, compacting with 8-10 tonnes smooth wheeled vibratory roller to achieve, the designed flexural strength, finishing and curing.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		<b>Unit = cum</b>						
		<b>Taking output = 450 cum (990 tonne)</b>						
		<b>a) Labour</b>						
		Mate	day	1.200	300.00	360.00	L-12	
		Mazdoor skilled	day	7.000	400.00	2800.00	L-15	
		Mazdoor	day	23.000	250.00	5750.00	L-13	
		<b>b) Machinery</b>						
		Front end loader 1 cum bucket capacity	hour	6.000	1253.00	7518.00	P&M-017	
		Cement concrete batch mix plant @ 75 cum per hour	hour	6.000	4235.00	25410.00	P&M-068	
		Electric generator 100 KVA	hour	6.000	762.00	4572.00	P&M-080	
		Paver with electronic sensor @ 75 cum/hr.	hour	6.000	2923.00	17538.00	P&M-034	
		Vibratory roller 8-10 t capacity	hour	8.000	658.00	5264.00	P&M-059	
		Water tanker with 5 km lead 6 KL capacity	hour	8.000	488.00	3904.00	P&M-060	
		Tipper	tonne.km	990xL	24.00	0.00	Lead =0 km & P&M-058	
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				0.00		
		<b>c) Material</b>						
		Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.3.	cum	405.000	1625.00	658125.00	M-052 and M-054	
		Sand as per IS: 383 and conforming to clause 602.2.3 @ 0.45 cum/cum of concrete	cum	203.000	540.00	109620.00	M-004	
		Cement @ 200 kg/cum of concrete	tonne	90.000	8120.00	730800.00	M-081	
		Cost of water	KL	48.000	60.00	2880.00	M-189	
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				157454.10		
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				173199.51		
		Cost for 450cum = a+b+c+d+e				1905194.61		
		<b>Rate per cum = (a+b+c+d+e)/450</b>				4233.77		
					<b>say</b>	<b><u>4234.00</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 AND OTHER APPURTENANCES

#### Preamble:

- 1 Rate analysis for fencing has been done for two different heights, i.e., 1.20 m and 1.80 m. Any of these two can be adopted depending upon a particular situation and design.
- 2 Rate analysis for fencing provides for three types as under :
  - a) Barbed wire fencing
  - b) Welded steel wire fencing with mesh size of 75X25 mm
  - c) Welded steel wire fabric with mesh size of 75X50 mm
- 3 Kerbstone laying and road marking has been provided for laying by mechanical means.
- 4 Back filling of foundation of boundary pillars has been proposed with stone spalls, tightly packed and compacted.
- 5 The item pertaining to road traffic signals has not been analysed as this is a specialised work and rates can be obtained from firms having specialisation for design and installation of this work.
- 6 For metal beam crash barrier, a 'W' shaped beam of size 311 x 83 mm flange width made with structural steel corrugated plate 3 mm thick and having a length of 4.5 m has been provided, over a channel post of 150 x 75 x 5 mm with a spacer of channel section 150 x 75 x 5 mm, 330 mm long.
- 7 Printing of letters and signs is required to be measured and paid separately. A separate rate for lettering has been prepared and included in this chapter for this purpose.
- 8 Two supports have been provided for direction and place identification signs where size is more than 0.9 sqm. Only one support is provided for size up to 0.9 sqm.
- 9 The traffic signs proposed are of retro-reflectorised type made of encapsulated lens type reflective sheeting fixed over aluminium sheeting as per Clause 801.3 and installation.
- 10 The size, location of traffic signs shall be as per IRC:67.
- 11 The rates for rigid, semi-rigid and flexible crash barriers have been included.
- 12 Provision has been made for a crane for installation of overhead signs.
- 13 Separate rates have been derived for Tubular steel railing with RCC posts and MS steel posts.
- 14 The organisation and financial aspects are required to be finalised in consultation with administrative and traffic authorities.
- 15 The rate for message display board for gantry mounted variable message sign is required to be ascertained from the market, this being a commercially produced item by specialised firms.

- 16 The rate analysis for traffic impact attenuators at abutments and piers have been included.
- 17 In the case of road signs and direction boards the depth of foundation and quantity of cement concrete provided in the rate analysis are indicative. These may be suitably increased in areas of higher wind velocities like coastal areas.

18 **Ducts for Utility Services Along and Across the Expressway/Highways :**

The running metre cost of duct along the road including inspection chambers (where applicable) or across the road will depend upon the approved design. The various item involved are earthen work, plain cement concrete, brick stone masonry, reinforcement cement concrete, form work, steel reinforcement, laying of pipe line (where duct is of pipe) and cast iron/RCC cover for the inspection chamber. The rate for these items are available under respective clauses which can be applied and running metre cost of duct worked out as per the approved design and drawing for particular situations. In case cast iron cover for the inspection chamber, the rate can be ascertained from the market for the size provided in the design and approved drawings.

19 **Noise Barriers :**

Noise barrier can be provided in the form of a brick wall of a suitable height as per the site requirement and approved design. The items involved for the construction of this barrier like earthwork, brick masonry, plain cement concrete, etc. are available in the Data Book, which can be applied to arrive at the cost of noise barrier based on the design adopted.

Alternatively, wherever space permits, cluster of trees, shrubs and plants can be grown by the road side 6 m away from the edge of the roadway. This will intercept the annoying sound waves and fumes from road vehicles.

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>					
		<b>A.</b>	<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	300.00	216.00	L-12
			Mason	day	2.000	400.00	800.00	L-11
			Mazdoor	day	16.000	250.00	4000.00	L-13
			<b>b) Machinery</b>					
			Kerb casting machine @ 60 metres/hour	hour	6.000	339.00	2034.00	P&M-029
			Concrete mixer 0.48/0.28 cum capacity	hour	12.000	242.00	2904.00	P&M-009
			Water tanker6 KL capacity	hour	5.000	488.00	2440.00	P&M-060
			<b>c) Material</b>					
			Crushed stone aggregate 20 mm nominal size 59 per cent	cum	21.790	1600.00	34864.00	M-053
			Coarse sand 30 per cent	cum	10.900	540.00	5886.00	M-005
			Cement 11 per cent	tonne	5.700	8120.00	46284.00	M-081
			Cost of water	KL	30.000	60.00	1800.00	M-189
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				10122.80	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				11135.08	
			Cost for 360 meter = a+b+c+d+e				122485.88	
			<b>Rate per metre = (a+b+c+d+e)/360</b>				340.24	
							<b>say 340.00</b>	
		<b>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	300.00	36.00	L-12
			Mason	day	1.000	400.00	400.00	L-11
			Mazdoor	day	2.000	250.00	500.00	L-13
			<b>b) Machinery</b>					
			Kerb casting machine @ 60 metres/hour	hour	6.000	339.00	2034.00	P&M-029
			Concrete batching and mixing plant @ 15 cum/hr.	hour	1.600	2033.00	3252.80	P&M-003
			Water tanker6 KL capacity	hour	5.000	488.00	2440.00	P&M-060
			Tipper 5.5 cum capacity	hour	6.000	609.00	3654.00	P&M-048
			<b>c) Material</b>					
			Crushed stone aggregate 20 mm nominal size 59 per cent	cum	21.790	1600.00	34864.00	M-053
			Coarse sand 30 per cent	cum	10.900	540.00	5886.00	M-004
			Cement 11 per cent	tonne	5.700	8120.00	46284.00	M-081
			Cost of water	KL	30.000	60.00	1800.00	M-189
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				10115.08	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				11126.59	
			Cost for 360 meter = a+b+c+d+e				122392.47	
			<b>Rate per metre = (a+b+c+d+e)/360</b>				339.98	
							<b>say 340.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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					
	<b>A</b>	<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	300.00	216.00	L-12
		Mason	day	2.000	400.00	800.00	L-11
		Mazdoor	day	16.000	250.00	4000.00	L-13
		<b>b) Machinery</b>					
		Kerb casting machine @ 50 metres/hour for laying kerb and channel	hour	6.000	339.00	2034.00	P&M-029
		Concrete mixer 0.48/0.28	hour	16.000	242.00	3872.00	P&M-009
		Water tanker 6 KL capacity	hour	6.000	488.00	2928.00	P&M-060
		<b>c) Material</b>					
		Crushed stone aggregate 20 mm nominal size 60 per cent	cum	36.590	1600.00	58544.00	M-053
		Coarse sand 30 per cent	cum	18.300	540.00	9882.00	M-005
		Cement 10 per cent	tonne	9.010	8120.00	73161.20	M-081
		Cost of water	KL	36.000	60.00	2160.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				15759.72	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				17335.69	
		Cost for 360 meter = a+b+c+d+e				190692.61	
		<b>Rate per metre = (a+b+c+d+e)/300</b>				635.64	
					<b>say</b>	<b>636.00</b>	
8.2	<b>B</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	300.00	36.00	L-12
		Mason	day	1.000	400.00	400.00	L-11
		Mazdoor	day	2.000	250.00	500.00	L-13
		<b>b) Machinery</b>					
		Kerb casting machine @ 50 metres/hour for laying kerb and channel	hour	6.000	339.00	2034.00	P&M-029
		Concrete batching and mixing plant @ 15 cum/hr.	hour	2.700	2033.00	5489.10	P&M-003
		Water tanker 6 KL capacity	hour	6.000	488.00	2928.00	P&M-060
		Tipper of 5.5 cum capacity	hour	6.000	609.00	3654.00	P&M-048

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Material</b>					
		Crushed stone aggregate 20 mm nominal size 60 per cent	cum	36.590	1600.00	58544.00	M-053
		Coarse sand 30 per cent	cum	18.300	540.00	9882.00	M-004
		Cement 10 per cent	tonne	9.010	8120.00	73161.20	M-081
		Cost of water	KL	36.000	60.00	2160.00	M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				15878.83	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				17466.71	
		Cost for 300 meter = a+b+c+d+e				192133.84	
		<b>Rate per metre = (a+b+c+d+e)/300</b>				640.45	
					<b>say</b>	<b>640.00</b>	
<b>8.3</b>	<b>801</b>	<b>Printing New Letter and Figures of any Shade</b>					
		Printing new letter and figures of any shade with synthetic enamel paint black or any other approved colour to give an even shade					
		(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	300.00	36.00	L-12
		Painter	day	2.000	400.00	800.00	L-18
		Mazdoor	day	1.000	250.00	250.00	L-13
		<b>b) Material</b>					
		Paint	Litre	0.700	198.00	138.60	M-131
		<b>c) Overhead charges @ 10 % on (a+b)</b>				122.46	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				134.71	
		Cost for 1600 cm = a+b+c+d				1481.77	
		<b>Rate per cm height per letter = (a+b+c+ d)/1600</b>				0.93	
					<b>say</b>	<b>0.90</b>	
<b>8.3</b>		(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	300.00	21.00	L-12
		Painter 1st class	day	1.250	400.00	500.00	L-18
		Mazdoor	day	0.500	250.00	125.00	L-13
		<b>b) Material</b>					
		Paint	Litre	0.500	198.00	99.00	M-131
		<b>c) Overhead charges @ 10 % on (a+b)</b>				74.50	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				81.95	
		Cost for 1600 cm = a+b+c+d				901.45	
		<b>Rate per cm height per letter = (a+b+c +d)/1600</b>				0.56	
					<b>say</b>	<b>0.60</b>	
<b>8.5</b>	<b>801</b>	<b>Direction and Place Identification Signs upto 0.9 sqm Size Board.</b>					
		Providing and erecting direction and place identification retro-reflectorised sign as per IRC:67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 2 mm thick with area not exceeding 0.9 sqm supported on a mild steel single angle iron post 75 x 75 x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 x 45 x 60 cm, 60 cm below ground level as per approved drawing					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = sqm</b>					
		<b>Taking output = 0.9 sqm</b>					
		<b>i) Excavation for foundation</b>	cum	0.216	254.00	54.86	Item No. 3.13
		<b>ii) Cement concrete M15 grade</b>	cum	0.120	6107.00	732.84	Item 12.8 (A)
		<b>iii) Painting angle iron post two coats</b>	sqm	0.430	61.00	26.23	Item 8.9
		<b>a) Labour (For fixing at site)</b>					
		Mate	day	0.010	300.00	3.00	L-12
		Mazdoor	day	0.200	250.00	50.00	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	57.21	1086.99	M-179 /1000
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting of size 0.9 sqm	sqm	0.900	145.00	130.50	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	427.00	8.54	P&M-053
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				127.90	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				140.69	
		Cost for 0.9 sqm = i+ii+iii+ a+b+c+d+e				2361.56	
		<b>Rate per sqm (for sign having area upto 0.9 sqm) = (i+ii+iii+a+b+c+d+e)/0.90</b>				2623.96	
					<b>say</b>	<b>2624.00</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					
8.6	801	<b>Direction and Place Identification Signs with size more than 0.9 sqm size Board.</b>					
		Providing and erecting direction and place identification retro-reflectorisred 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	254.00	109.22	Item No. 3.13
		<b>ii) Cement concrete M15 grade</b>	cum	0.240	6107.00	1465.68	Item 12.8 (A)
		<b>iii) Painting angle iron post 2 coats</b>	sqm	0.860	61.00	52.46	Item 8.9
		<b>a) Labour (For fixing at site)</b>					
		Mate	day	0.010	300.00	3.00	L-12
		Mazdoor	day	0.300	250.00	75.00	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	57.21	2173.98	M-179 /1000
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting	sqm	1.500	145.00	217.50	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	427.00	8.54	P&M-053
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				240.00	

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)				271.80	
		Cost for 1.5 sqm =I+ii+ii+ a+b+c+d+e				4617.18	
		Rate per sqm ( for sign having area more than 0.9 sqm) = ( i+ii+iii+a+b+c+d+e)/1.50				5130.20	
					say	<u>5130.00</u>	
		Note					
		i) Lettering and arrow marks on sign board to be provided separately as per actual requirement. Rates for these items have been analysed separately					
		ii) Rate for excavation, cement concrete M-15 and painting may be taken from respective chapters					
8.8	803	<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>					
		a) Labour					
		Mate	day	0.120	300.00	36.00	L-12
		Painter	day	2.000	400.00	800.00	L-18
		Mazdoor	day	1.000	250.00	250.00	L-13
		b) Material					
		Paint conforming to requirement of clause 803.3.	Litre	6.000	176.00	1056.00	M-132
		Add for scaffolding @ 1 per cent of labour cost where required				10.56	
		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.				107.10	
		c) Overhead charges @ 10 % on (a+b)				225.97	
		d) Contractor's profit @ 10 % on (a+b+c)				248.56	
		Cost for 40 sqm = a+b+c+d				2734.19	
		Rate per sqm = (a+b+c+d)/40				68.35	
					say	<u>68.00</u>	
8.9	803	<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>					
		a) Labour					
		Mate	day	0.030	300.00	9.00	L-12
		Painter	day	0.450	400.00	180.00	L-18
		Mazdoor	day	0.250	250.00	62.50	L-13
		b) Material					
		Paint ready mixed approved brand.	Litre	1.250	198.00	247.50	M-131
		Add @ 1 per cent on cost of material for scaffolding				2.48	
		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.				24.95	
		c) Overhead charges @ 10 % on (a+b)				52.64	
		d) Contractor's profit @ 10 % on (a+b+c)				57.91	
		Cost for 10 sqm = a+b+c+d				636.97	
		Rate per sqm= (a+b+c+d)/10				63.70	
					say	<u>64.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.10	803	<b>Painting on Wood Surfaces</b>					
		Providing and applying two coats of ready mix paint of approved brand on wood surface after thorough cleaning of surface to give an even shade					
		<b>Unit = sqm</b>					
		<b>Taking output = 10 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.030	300.00	9.00	L-12
		Painter	day	0.500	400.00	200.00	L-18
		Mazdoor	day	0.200	250.00	50.00	L-13
		<b>b) Material</b>					
		Paint ready mixed of approved brand.	Litre	1.500	198.00	297.00	M-131
		Add @ 1 per cent on cost of material for scaffolding				2.97	
		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.				27.80	
		<b>c) Overhead charges @ 10 % on (a+b)</b>				58.68	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				64.54	
		Cost for 10 sqm = a+b+c+d				709.99	
		<b>Rate per sqm = (a+b+c+d)/10</b>				71.00	
					<b>say</b>	<b>71.00</b>	
8.11	803	<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>					
		<b>a) Labour</b>					
		Mate	day	0.090	300.00	27.00	L-12
		Painter	day	0.550	400.00	220.00	L-18
		Mazdoor	day	1.550	250.00	387.50	L-13
		<b>b) Material</b>					
		Road marking Paint as per IS :164	Litre	1.480	176.00	260.48	M-132
		<b>c) Overhead charges @ 10 % on (a+b)</b>				89.50	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				98.45	
		Cost for 10 sqm = a+b+c+d				1082.93	
		<b>Rate per sqm= (a+b+c+d)/10</b>				108.29	
					<b>say</b>	<b>108.00</b>	
8.11		<b>(ii) Up to 10 cm in width</b>					
		<b>Unit = sqm</b>					
		<b>Taking output = 10 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.070	300.00	21.00	L-12
		Painter	day	0.350	400.00	140.00	L-18
		Mazdoor	day	1.350	250.00	337.50	L-13
		<b>b) Material</b>					
		Road marking paint	Litre	1.480	176.00	260.48	M-132
		<b>c) Overhead charges @ 10 % on (a+b)</b>				75.90	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				83.49	
		Cost for 10 sqm = a+b+c+d				918.37	
		<b>Rate per sqm = (a+b+c+d)/10</b>				91.84	
					<b>say</b>	<b>92.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.12	803	<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>					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm</i>					
		<b>a) Labour</b>					
		Mate	day	0.060	300.00	18.00	L-12
		Painter 1st class	day	0.300	400.00	120.00	L-18
		Mazdoor	day	1.250	250.00	312.50	L-13
		<b>b) Material</b>					
		Road marking paint	Litre	0.900	176.00	158.40	M-132
		<b>c) Overhead charges @ 10 % on (a+b)</b>				60.89	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				66.98	
		Cost for 10 sqm = a+b+c+d				736.77	
		<b>Rate per sqm = (a+b+c+d)/10</b>				73.68	
					<b>say</b>	<b>74.00</b>	
8.12	(ii)	<b>Up to 10 cm in width</b>					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm</i>					
		<b>a) Labour</b>					
		Mate	day	0.070	300.00	21.00	L-12
		Painter 1st class	day	0.350	400.00	140.00	L-18
		Mazdoor	day	1.350	250.00	337.50	L-13
		<b>b) Material</b>					
		Road marking Paint	Litre	0.900	176.00	158.40	M-132
		<b>c) Overhead charges @ 10 % on (a+b)</b>				65.69	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				72.26	
		Cost for 10 sqm = a+b+c+d				794.85	
		<b>Rate per sqm = (a+b+c+d)/10</b>				79.48	
					<b>say</b>	<b>79.00</b>	
8.13	803	<b>Road Marking with Hot Applied Thermoplastic Compound with Reflectorising Glass Beads on Bituminous Surface</b>					
		Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes.					
		<i>Unit = sqm</i>					
		<i>Taking output = 600 sqm</i>					
		<b>a) Labour</b>					
		Mate	day	0.030	300.00	9.00	L-12
		Mazdoor	day	0.750	250.00	187.50	L-13
		<b>b) Machinery</b>					
		Road marking machine @ 60 sqm per hour	hour	10.000	101.00	1010.00	P&M-043
		Tractor-trolley	hour	0.500	427.00	213.50	P&M-053
		<b>c) Material</b>					
		Hot applied thermoplastic compound	Litre	1500.000	179.00	268500.00	M-118
		Reflectorising glass beads	kg	150.000	208.00	31200.00	M-152

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 10 % on (a+b+c)				30112.00	
		e) Contractor's profit @ 10 % on (a+b+c+d)				33123.20	
		Cost for 600 sqm = a+b+c+d+e				364355.20	
		Rate per sqm = a+b+c+d+e)/600				607.26	
					say	<u>607.00</u>	
		<b>Note</b> 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	<b>Kilometre Stone</b>					
		Reinforced cement concrete M15 grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and printing etc					
		(i) 5th kilometre stone (precast)					
		<i>Unit = Nos.</i>					
		<i>Taking output = 6 Nos.</i>					
		a) M-15 grade of concrete	cum	2.350	6107.00	14351.45	Item 12.8 (A)
		b) Steel reinforcement @ 5 kg per sqm	kg	22.080	78.33	1729.48	Item 13.6 /1000
		c) Excavation in soil for foundation	cum	1.680	254.00	426.72	Item No. 3.13
		d) Painting two coats on concrete surface	sqm	9.850	65.00	640.25	Item 8.8
		e) Lettering on km post (average 30 letters of 10 cm height each)	per cm per letter	1800.000	0.60	1080.00	Item 8.3
		<b>Transportation and fixing</b>					
		f) Labour					
		Mate	day	0.260	300.00	78.00	L-12
		Mason	day	0.600	400.00	240.00	L-11
		Mazdoor including loading/unloading	day	6.000	250.00	1500.00	L-13
		g) Machinery					
		Tractor-trolley	hour	6.000	427.00	2562.00	P&M-053
		h) Overhead charges @ 10 % on (f+g)				438.00	
		i) Contractor's profit @ 10 % on (f+g+h)				481.80	
		Cost for 6 Nos. 5th km stone = a+b+c+ d+e +f+g+h +i				23527.70	
		Rate for each 5th km stone = (a+b+c+ d+e +f+g+h +i ) /6				3921.28	
					say	<u>3921.00</u>	
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	6107.00	23023.39	Item 12.8 (A)
		b) Steel reinforcement @ 5 kg per sqm	kg	26.320	78.33	2061.59	Item 13.6 /1000
		c) Excavation in soil for foundation	cum	2.770	254.00	703.58	Item No. 3.13
		d) Painting two coats on concrete surface	sqm	11.410	65.00	741.65	Item 8.8
		e) Lettering on km post ( average 12 letters of 10 cm height each)	per cm per letter	1680.000	0.60	1008.00	Item 8.3
		<b>Transportation and fixing</b>					
		f) Labour					
		Mate	day	0.320	300.00	96.00	L-12
		Mason	day	1.000	400.00	400.00	L-11
		Mazdoor	day	7.000	250.00	1750.00	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>g) Machinery</b>					
		Tractor-trolley	hour	6.000	427.00	2562.00	P&M-053
		<b>h) Overhead charges @ 10 % on (f+g)</b>				480.80	
		<b>i) Contractor's profit @ 10 % on (f+g+h)</b>				528.88	
		Cost for 14 Nos. ordinary km stone = (a+b+ c +d+e+f+g+h+i)				33355.89	
		Rate for each ordinary km stone = (a+b+ c +d+e+f+g+h+i) /14				2382.56	
					<b>say</b>	<b>2383.00</b>	
8.14	(iii)	<b>Hectometer stone (precast)</b>					
		<b>Unit = Nos.</b>					
		<b>Taking output = 33 Nos.</b>					
		<b>a) M-15 grade of concrete</b>	cum	1.580	6107.00	9649.06	Item 12.8 (A)
		<b>b) Steel reinforcement @ 5 kg per sqm</b>	kg	66.000	78.33	5169.65	Item 13.6 /1000
		<b>c) Excavation in soil for foundation</b>	cum	1.390	254.00	353.06	Item No. 3.13
		<b>d) Painting two coats on concrete surface</b>	sqm	6.270	65.00	407.55	Item 8.8
		<b>e) Lettering on km post (average 1 letter of 10 cm height each)</b>	per cm per letter	330.000	0.60	198.00	Item 8.3
		<b>Transportation and fixing</b>					
		<b>f) Labour</b>					
		Mate	day	0.340	300.00	102.00	L-12
		Mason	day	1.500	400.00	600.00	L-11
		Mazdoor	day	7.000	250.00	1750.00	L-13
		<b>g) Machinery</b>					
		Tractor-trolley	hour	6.000	427.00	2562.00	P&M-053
		<b>h) Overhead charges @ 10 % on (f+g)</b>				501.40	
		<b>i) Contractor's profit @ 10 % on (f+g+h)</b>				551.54	
		Cost for 33 Nos. Hectometer stone = (a+b +c +d+e+f+g+h+i)				21844.26	
		Rate for each Hectometer stone = (a+b +c +d+e+f+g+h+i) 33				661.95	
					<b>say</b>	<b>662.00</b>	
	<b>Note</b>	The rate for excavation, cement concrete, steel reinforcement, painting and lettering may be taken from respective chapters.					
8.16	806	<b>Boundary pillar</b>					
		Reinforced cement concrete M15 grade boundary pillars of standard design as per IRC:25-1967, fixed in position including finishing and lettering but excluding painting					
		<b>Unit = Each</b>					
		<b>Taking output = 57 Nos.</b>					
		<b>a) M-15 grade of the boundary stone</b>	cum	1.250	6107.00	7633.75	Item 12.8 (A)
		<b>b) Steel reinforcement</b>	kg	79.800	78.33	6250.57	Item 13.6 /1000
		<b>c) Excavation in soil</b>	cum	10.720	254.00	2722.88	Item No. 3.13
		<b>d) Lettering, each 10 cm high</b>	per letter per cm high	2280.000	0.60	1368.00	Item 8.3
		<b>Transportation and fixing</b>					
		<b>e) Labour</b>					
		Mate	day	0.570	300.00	171.00	L-12
		Mazdoor	day	14.250	250.00	3562.50	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>f) Machinery</b>					
		Tractor-trolley	hour	6.000	427.00	2562.00	P&M-053
		<b>g) Material</b>					
		Stone spall	cum	11.970	400.00	4788.00	M-008
		<b>h) Overhead charges @ 10 % on (e+f+g)</b>				1108.35	
		<b>i) Contractor's profit @ 10 % on (e+f+g+h)</b>				1219.19	
		Cost for 57 Nos. boundary pillar = (a+b +c+d +e+ f+g+h+i )				31386.24	
		<b>Rate for each boundary pillar = (a+b+c+d+e+ f+g+h+i)/57</b>				550.64	
					<b>say</b>	<b>551.00</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.
<b>8.17</b>	<b>807</b>	<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>					
		<b>Taking output = 30 metres</b>					
		<b>a) Labour</b>					
		Mate	day	0.090	300.00	27.00	L-12
		Blacksmith	day	0.250	400.00	100.00	L-02
		Mazdoor	day	2.000	250.00	500.00	L-13
		<b>b) Material</b>					
		Barbed wire 335 metres length @ 9.38 kg per 100 metres	kg	31.420	90.00	2827.80	M-063
		MS angle iron 40 mm x 40mm x 6 mm, 23 metres in length @ 3.5 kg per metre	kg	80.500	57.21	4605.41	M-179 /1000
		Add for GI staple binding wire, drilling holes etc. @ 2 per cent of the cost of material				148.66	
		<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	61.00	128.71	Item 8.9
		<b>d) Overhead charges @ 10 % on (a+b)</b>				820.89	
		<b>e) Contractor's profit @ 10 % on (a+b+d)</b>				902.98	
		Cost for 30 metres fencing = a+b+c+d+e				10061.44	
		<b>Rate per metre = (a+b+c+d+e)/30</b>				335.38	
					<b>say</b>	<b>335.00</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.

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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>					
		Taking output = 30 metres					
		<b>a) Labour</b>					
		Mate	day	0.120	300.00	36.00	L-12
		Blacksmith	day	0.400	400.00	160.00	L-02
		Mazdoor	day	2.500	250.00	625.00	L-13
		<b>b) Material</b>					
		Barbed wire 428 metres length @ 9.38 kg per 100 metres	kg	40.150	90.00	3613.50	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	57.21	8695.92	M-179 /1000
		Add for GI staple, binding wire, drilling holes etc. @ 2 per cent of the cost of material				246.19	
		<b>c) Painting</b>					
		Applying two coats of painting on exposed surface of angle iron posts	sqm	3.960	61.00	241.56	Item 8.9
		<b>d) Overhead charges @ 10 % on (a+b)</b>				1337.66	
		<b>e) Contractor's profit @ 10 % on (a+b+d)</b>				1471.43	
		Cost for 30 metres fencing = a+b+c+d+e				16427.26	
		<b>Rate per metre fencing = (a+b+c +d+e)/30</b>				547.58	
					say	<b>548.00</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.					
8.19	Suggestive	<b>Fencing With Welded Steel Wire Fabric 75 mm x 50 mm</b>					
		Providing 1.20 metre high fencing with angle iron posts 50 mm x 50 mm x 6 mm at 3 metre center to center with 0.40 metre embedded in M15 grade cement concrete, corner, end and every 10th post to be strutted, provided with welded steel wire fabric of 75 mm x 50 mm mesh or 75 mm x 25 mm mesh and fixed to iron posts by flat iron 50 x 5 mm and bolts etc. complete in all respects.					
		<b>Unit = Running metre</b>					
		Taking output = 30 m					
		<b>a) Labour</b>					
		Mate	day	0.120	300.00	36.00	L-12
		Welder	day	1.000	400.00	400.00	L-02
		Mazdoor	day	2.000	250.00	500.00	L-13
		<b>b) Material</b>					
		i) Angle iron for posts 50 x 50 x 6 mm	kg	106.000	57.21	6064.26	M-179 /1000
		ii) Runner flat 50 x 5 mm	kg	26.000	57.21	1487.46	M-179 /1000
		iii) Welded steel wire fabric 75x50 mm mesh @ 4 kg/sqm, 4 x 30 x 1.2 + 5 per cent wastage	kg	151.000	44.00	6644.00	M-191
		<b>OR</b>					
		Welded steel wire fabric 75 x 25 mm mesh @ 7.75 kg/sqm, 7.75 x 30 x 1.2 + 5 per cent wastage	kg	293.000			

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add 2.5 per cent of cost of material for drilling holes in angles, flats, splitting angle at bottom, nuts and bolts and welded consumables					
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.100	427.00	42.70	P&M-053
		<b>d) Painting</b>					
		Painting two coats including priming	sqm	8.000	61.00	488.00	Item 8.9
		<b>e) Overhead charges @ 10 % on (a+b+c)</b>				1517.44	
		<b>f) Contractor's profit @ 10 % on (a+b+c+e)</b>				1669.19	
		Cost for 30 metre = a+b+c+d+e+f				18849.05	
		<b>Rate per metre = (a+b+c+d+e+f)/30</b>				628.30	
					<b>say</b>	<b>628.00</b>	
		<b>Note</b>					
		i) Adopt any one type of welded steel wire fabric 75 x 50 mm or 75 x 25 mm as per approved design.					
		ii) The item of excavation and cement concrete in foundation shall be measured and paid separately					
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	254.00	329.18	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	6107.00	3957.34	Item 12.8 (A)
		<b>iii) Painting of pipe</b>	sqm	4.710	61.00	287.31	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	61.00	131.76	Item 8.9
		<b>a) Labour (For fixing at site)</b>					
		Mate	day	0.010	300.00	3.00	L-12
		Mazdoor	day	0.250	250.00	62.50	L-13
		Plumber	day	0.010	400.00	4.00	L-02
		<b>b) Material</b>					
		Steel pipe 50 mm external dia as per IS:1239	metre	30.000	385.00	11550.00	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	57.21	5684.39	M-179 /1000
		Add for drilling holes @ 2 per cent of cost of channels				113.69	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.040	427.00	17.08	P&M-053
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				2212.32	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				2433.55	
		Cost for 10 metre =i+ii+iii+iv+ a+b+c+d+e				26786.11	
		<b>Rate per metre = (i+ii+iii+iv+a+b+c+d+e)/10</b>				2678.61	
					<b>say</b>	<b>2679.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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 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					
		<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	254.00	329.18	Item No. 3.13
		ii) Foundation concrete M - 15 grade PCC 6 x 0.6 x 0.6 x 0.3	cum	0.648	6107.00	3957.34	Item 12.8 (A)
		iii) RCC M - 20 for pre cast posts 6 nos of 1.8 metres each	cum	0.320	7792.00	2493.44	Item 14.1(A)
		iv) Painting of pipe	sqm	4.710	61.00	287.31	Item 8.9
		<b>a) Labour</b>					
		Mate	day	0.014	300.00	4.20	L-12
		Mazdoor	day	0.350	250.00	87.50	L-13
		Plumber	day	0.010	400.00	4.00	L-02
		<b>b) Material</b>					
		Steel pipe 50 mm dia as per IS:1239	metre	30.000	385.00	11550.00	M-175
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.250	427.00	106.75	P&M-053
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				1175.25	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				1292.77	
		Cost for 10 metre = i+ii+iii+iv+ a+b+c+d+e				21287.73	
		<b>Rate per metre = (i+ii+iii+iv+a+b+c+d+e)/10</b>				2128.77	
					<b>say</b>	<b>2129.00</b>	
8.22	809	<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	7792.00	23376.00	Item 14.1(A)
		<b>b) Labour</b>					
		Mate	day	0.040	300.00	12.00	L-12
		Mazdoor	day	1.000	250.00	250.00	L-13
		<b>c) Material</b>					
		HYSD steel reinforcement including dowel bars	tonne	0.280	53650.00	15022.00	M-082
		Pre-moulded asphalt filler board	sqm	0.320	60.00	19.20	M-144
		<b>d) Overhead charges @ 10 % on (b+c)</b>				1530.32	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>e) Contractor's profit @ 10 % on (b+c+d)</b>				1683.35	
		Cost for 10 metre = a+b+c+d+e				41892.87	
		<b>Rate per metre = (a+b+c+d+e)/10</b>				4189.29	
					<b>say</b>	<b><u>4189.00</u></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>					
		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>					
		<b>Taking output = 4.5 metre length</b>					
		<b>a) Labour</b>					
		Mate	day	0.060	300.00	18.00	L-12
		Blacksmith	day	0.500	400.00	200.00	L-02
		Mazdoor	day	1.000	250.00	250.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.100	427.00	42.70	P&M-053
		<b>c) Material</b>					
		Corrugated sheet,3 mm thick, "W" beam section railing,4.5 m in length	kg	41.210	57.21	2357.62	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	57.21	5066.52	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	57.21	929.09	M-179 /1000
		Nuts and bolts	kg	20.000	100.00	2000.00	M-130
		Add 25 per cent of the cost of material for fabrication, nuts, bolts and washers etc.)				2588.31	
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				1345.22	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				1479.75	
		Cost for 4.5 metre = a+b+c+d+e				16277.21	
		<b>Rate per metre = (a+b+c+d+e)/4.5</b>				3617.16	
					<b>say</b>	<b><u>3617.00</u></b>	
<b>8.23</b>		<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					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = Running metre</b>					
		Taking output = 4.5 metre length					
		<b>a) Labour</b>					
		Mate	day	0.060	300.00	18.00	L-12
		Blacksmith	day	0.500	400.00	200.00	L-02
		Mazdoor	day	1.000	250.00	250.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.100	427.00	42.70	P&M-053
		<b>c) Material</b>					
		Corrugated sheet,3 mm thick, "Thrie" beam section railing,4.5 m in length	kg	72.940	60.00	4376.40	M-088
		Channel post 150 x 75 x 5 mm, 2 m long,3 Nos @ 16.4 kg per metre	kg	98.400	57.21	5629.46	M-179 /1000
		Spacer 150 x 75 x 5 mm channel 0.546 m long,3 Nos	kg	26.860	57.21	1536.66	M-179 /1000
		Nuts and bolts	kg	30.000	100.00	3000.00	M-130
		Add 15 per cent of the cost of material for fabrication, nuts, bolts and washers etc.)				2181.38	
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				1723.46	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				1895.81	
		Cost for 4.5 metre = a+b+c+d+e				20853.87	
		<b>Rate per metre= (a+b+c+d+e)/4.5</b>				4634.19	
					<b>say</b>	<b>4634.00</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.					
8.24	811	<b>Road Traffic Signals electrically operated</b>					
		<b>Note</b>					
		Since it is a ready made item commercially produced and erected by specialised firm in the electrical and electronic field, rate may be taken based on market enquiry from firms specialised in this field and ISI certified for the approved design and drawing.					
8.25	Suggestive	<b>Flexible Crash Barrier, Wire Rope Safety Barrier</b>					
		Providing and erecting a wire rope safety barrier with vertical posts of medium weight RS Joist (ISMB series) 100 mm x 75 mm (11.50 kg/m), 1.50 m long 0.85 m above ground and 0.65 m below ground level, split at the bottom for better grip, embedded in M 15 grade cement concrete 450 x 450 x 450 mm, 1.50 m center to center and with 4 horizontal steel wire rope 40 mm dia and anchored at terminal posts 15 m apart. Terminal post to be embedded in M 15 grade cement concrete foundation 2400 x 450 x 900 mm (depth), strengthened by a strut of RS joist 100 x 75 mm, 2 m long at 450 inclination and a tie 100 x 8 mm, 1.50 m long at the bottom, all embedded in foundation concrete as per approved design and drawing, rate excluding excavation and cement concrete.					
		<b>Unit = Running metre</b>					
		Taking output = 15 metre					
		<b>a) Labour</b>					
		Mate	day	0.120	300.00	36.00	L-12
		Mazdoor	day	2.000	250.00	500.00	L-13
		Blacksmith	day	1.000	400.00	400.00	L-02

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Material</b>					
		i) RS Joist 100 x 75 mm - 16.5 m @ 11.5 kg per metre	kg	190.000	57.21	10869.90	M-179 /1000
		ii) Struts - 2 Nos. for terminal posts, 2 m long each 2 x 2 x 11.50	kg	46.000	57.21	2631.66	M-179 /1000
		iii) Tie 2 Nos. of 8 mm steel plate, 1.5 sqm each for terminal posts @ 62.80 kg/sqm (2 x 1.5)	kg	188.400	57.21	10778.36	M-179 /1000
		iv) Steel wire rope 40 mm, including 7.50 per cent extra for fixing at ends 15 x 4 x 1.075 @ 1 kg per m	kg	65.000	221.00	14365.00	M-177
		Add 5 per cent of cost of material for drilling, gripping, fixing, fabrication and welding consumables				1932.25	
		<b>c) Painting</b>					
		Applying 2 coats of painting on exposed surface	sqm	16.500	61.00	1006.50	Item 8.9
		<b>d) Machinery</b>					
		Tractor-trolley	hour	0.250	427.00	106.75	P&M-053
		<b>e) Overhead charges @ 10 % on (a+b+d)</b>				4161.99	
		<b>f) Contractor's profit @ 10 % on (a+b+d+e)</b>				4578.19	
		Cost for 15 m = a+b+c+d+e+f				51366.60	
		<b>Rate per m = (a+b+c+d+e+f)/15</b>				3424.44	
					<b>say</b>	<b>3424.00</b>	
		<b>Note</b>					The items of excavations and cement concrete works will be measured and included separately as per the approved designs and drawings.
8.27	<b>Suggestive</b>	<b>Street Lighting</b>					
		Providing and erecting street light mounted on a steel circular hollow pole of standard specifications for street lighting, 9 m high spaced 40 m apart, 1.8 m overhang on both sides if fixed in the median and on one side if fixed on the footpath, fitted with sodium vapour lamp and fixed firmly in concrete foundation.					
		<b>Unit = Each</b>					
		Taking output = one light					
		<b>a) Labour</b>					
		Mate	day	0.030	300.00	9.00	L-12
		Mazdoor	day	0.500	250.00	125.00	L-13
		Electrician	day	0.250	400.00	100.00	L-02
		<b>b) Material</b>					
		i) Steel circular hollow pole of standard specification for street lighting to mount light at 9 m height above road level	each	1.000	9075.00	9075.00	M-171
		ii) Sodium vapour lamp	each	1.000	1815.00	1815.00	M-168
		Add 5 per cent of cost of material for holder, electric cable, insulation, ladder, scaffolding etc				544.50	
		<b>c) Painting</b>					
		<b>For Fixing in Median</b>					
		Providing two coats of alluminium paint over steel circular hollow pipe with overhang on both sides	sqm	5.750	61.00	350.75	Item 8.9
		<b>For fixing in Footpath</b>					
		Providing two coats of alluminium paint over steel circular hollow pipe with overhang on one side	sqm	4.630	61.00	282.43	Item 8.9
		(i) <b>For Fixing in Median</b>					
		<b>d) Overhead charges @ 10 % on (a+b)</b>				1166.85	
		<b>e) Contractor's profit @ 10 % on (a+b+d)</b>				1283.54	
		<b>Rate per light for fixing in Median= a+b+c+d+e</b>				14469.64	
					<b>say</b>	<b>14470.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		(ii) For fixing in Footpath					
		Rate per light for Fixing in Footpath = a+b+c+d+e				14401.32	
					say	<u>14401.00</u>	
		Note					
		The items of excavation and cement concrete foundation will be measured and included separately in the estimate as per approved design and drawing. The rate for painting has been analysed in this chapter.					
8.28	Suggestive	Lighting on Bridges					
		Providing and fixing lighting on bridges, mounted on steel hollow circular poles of standard specifications, 5 m high fixed on parapets with cement concrete, 20 m apart and fitted with sodium vapour lamp					
		Unit = Each					
		Taking output = one light					
		a) Labour					
		Mate	day	0.020	300.00	6.00	L-12
		Mazdoor	day	0.400	250.00	100.00	L-13
		Electrician	day	0.200	400.00	80.00	L-02
		b) Material					
		i) Steel circular hollow pole of standard specification for street lighting to mount light at 5 m above deck level	each	1.000	5500.00	5500.00	M-170
		ii) Sodium vapour lamp 70 watt	each	1.000	1815.00	1815.00	M-168
		Add 1 per cent of cost of material for holder, electric cable, insulation, ladder, scaffolding etc				73.15	
		c) Painting					
		Providing two coats of alluminium paint over steel circular hollow pipe	sqm	2.760	61.00	168.36	Item 8.9
		d) Overhead charges @ 10 % on (a+b)				757.42	
		e) Contractor's profit @ 10 % on (a+b+d)				833.16	
		Rate per light = a+b+c+d+e				9333.08	
					say	<u>9333.00</u>	
		Note					
		The items of cement concrete to be measured and paid separately as per approved design. The rate for painting has already been analysed in this chapter.					
8.29	Suggestive	Cable Duct Across the Road					
		Providing and laying of a reinforced cement concrete pipe duct, 300 mm dia, across the road (new construction), extending from drain to drain in cuts and toe of slope to toe of slope in fills, constructing head walls at both ends, providing a minimum fill of granular material over top and sides of RCC pipe as per IRC:98-1997, bedded on a 0.3 m thick layer of granular material free of rock pieces, outer to outer distance of pipe at least half dia of pipe subject to minimum 450 mm in case of double and triple row ducts, joints to be made leak proof, invert level of duct to be above higher than ground level to prevent entry of water and dirt, all as per IRC: 98 - 1997 and approved drawings.					
		(i) Single row for one utility service					
		Unit = Running metre					
		Taking output = 20metres					
		a) Random Rubble masonry/Brick masonry in cement mortar 1:6 for head wall both side	cum	2.360	3467.00	8182.12	Item 12.7 (Addl) B)
		b) Labour					
		Mate	day	0.050	300.00	15.00	L-12
		Mazdoor	day	1.000	250.00	250.00	L-13
		Mazdoor skilled	day	0.250	400.00	100.00	L-15

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Material</b>					
		Reinforced Cement Concrete pipe 300 mm dia	metre	20.000	423.00	8460.00	M-151
		Granular soil with PI less than 6 for bedding and sides of pipe (0.6 x 0.6 x 20 m)	cum	7.200	390.00	2808.00	M-009
		Collar for joints 300 mm dia	each	9.000	126.00	1134.00	M-083
		Cement mortar 1:2 for joints	cum	0.020	6198.00	123.96	Item 12.6 (B)
		<b>d) Machinery</b>					
		Tractor-trolley	hour	0.500	427.00	213.50	P&M-053
		<b>e) Overhead charges @ 10 % on (b+c+d)</b>				1310.45	
		<b>f) Contractor's profit @ 10 % on (b+c+d+e)</b>				1441.49	
		Cost for 20 metre = a+b+c+d+e+f				24038.52	
		<b>Rate per metre = (a+b+c+d+e+f)/20</b>				1201.93	
					<b>say</b>	<b>1202.00</b>	
8.29	(ii)	<b>Double row for two utility services</b>					
		<b>Unit = Running metre</b>					
		Taking output = 20metres					
		<b>a) Random Rubble brick/Brick masonry in cement mortar 1:6 for head wall both sides.</b>	cum	3.370	3467.00	11683.79	Item 12.7 (Addl) B)
		<b>b) Labour</b>					
		Mate	day	0.050	300.00	15.00	L-12
		Mazdoor	day	2.000	250.00	500.00	L-13
		Mazdoor skilled	day	0.250	400.00	100.00	L-15
		<b>c) Material</b>					
		Reinforced Cement Concrete pipe 300 mm dia	metre	40.000	423.00	16920.00	M-151
		Granular soil with PI less than 6 for bedding and sides of pipe (0.6 x 0.6 x 40 m)	cum	14.400	390.00	5616.00	M-009
		Collar for joints 300 mm dia	each	18.000	126.00	2268.00	M-083
		Cement mortar 1:2 for joints	cum	0.040	6198.00	247.92	Item 12.6 (B)
		<b>d) Machinery</b>					
		Tractor-trolley	hour	1.000	427.00	427.00	P&M-053
		<b>e) Overhead charges @ 10 % on (b+c+d)</b>				2609.39	
		<b>f) Contractor's profit @ 10 % on (b+c+d+e)</b>				2870.33	
		Cost for 20 metre = a+b+c+d+e+f				43257.43	
		<b>Rate per metre = (a+b+c+d+e+f)/20</b>				2162.87	
					<b>say</b>	<b>2163.00</b>	
8.29	(iii)	<b>Triple rRow for three utility services</b>					
		<b>Unit = Running metre</b>					
		Taking output = 20metres					
		<b>a) Random Rubble brick/Brick masonry in cement mortar 1:6 for head wall both sides.</b>	cum	4.380	3467.00	15185.46	Item 12.7 (Addl) B)
		<b>b) Labour</b>					
		Mate	day	0.160	300.00	48.00	L-12
		Mazdoor	day	3.000	250.00	750.00	L-13
		Mazdoor skilled	day	1.000	400.00	400.00	L-15
		<b>c) Material</b>					
		Reinforced Cement Concrete pipe 300 mm dia	metre	60.000	423.00	25380.00	M-151
		Granular soil with PI less than 6 for bedding and sides of pipe (0.6 x 0.6 x 60 m)	cum	21.600	390.00	8424.00	M-009
		Collar for joints 300 mm dia	each	27.000	126.00	3402.00	M-083
		Cement mortar 1:2 for joints	cum	0.060	6198.00	371.88	Item 12.6 (B)

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>d) Machinery</b>					
		Tractor-trolley	hour	1.500	427.00	640.50	P&M-053
		<b>e) Overhead charges @ 10 % on (b+c+d)</b>				3941.64	
		<b>f) Contractor's profit @ 10 % on (b+c+d+e)</b>				4335.80	
		Cost for 20 metre = a+b+c+d+e+f				62879.28	
		<b>Rate per metre = (a+b+c+d+e+f)/20</b>				3143.96	
					<b>say</b>	<b>3144.00</b>	
	<b>Note</b>	1.Inspection chamber at both ends is the responsibility of the agency who is laying the duct. Hence not included.					
		2.The rates for stone masonry / brick masonry and cement mortar to be adopted from respective clauses.					
<b>8.35</b>	<b>Suggestive</b>	<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>					
		Taking output = 50Nos					
		<b>a) Labour</b>					
		Mate	day	0.040	300.00	12.00	L-12
		Mazdoor	day	1.000	250.00	250.00	L-13
		<b>b) Material</b>					
		Aluminium studs 100 x 100 mm fitted with lense reflectors	each	50.000	484.00	24200.00	M-062
		Add 10 per cent of cost of material for fixing and installation				2420.00	
		<b>c) Overhead charges @ 10 % on (a+b)</b>				2688.20	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2957.02	
		Cost for 50 studs = a+b+c+d				32527.22	
		<b>Rate per studs = (a+b+c+d)/50</b>				650.54	
					<b>say</b>	<b>651.00</b>	
<b>8.36</b>	<b>Suggestive</b>	<b>Traffic Cone</b>					
		Provision of red fluorescent with white reflective sleeve traffic cone made of low density polyethylene (LDPE) material with a square base of 390 x 390 x 35 mm and a height of 770 mm, 4 kg in weight, placed at 1.5 m interval, all as per BS 873					
		<b>Unit = Running metre</b>					
		Taking output = 68 Nos.					
		<b>a) Labour</b>					
		Mate	day	0.020	300.00	6.00	L-12
		Mazdoor	day	0.500	250.00	125.00	L-13
		<b>b) Material</b>					
		Traffic cones with 150 mm reflective sleeve	each	68.000	1320.00	89760.00	M-186
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.100	427.00	42.70	P&M-053
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				8993.37	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				9892.71	
		Cost for 68 Nos. = a+b+c+d+e				108819.78	
		<b>Rate per metre = (a+b+c+d+e)/68</b>				1600.29	
					<b>say</b>	<b>1600.00</b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.38	Suggestive	<b>Rumble Strips</b>					
		Provision of 15 nos rumble strips covered with premix bituminous carpet, 15-20 mm high at center, 250 mm wide placed at 1 m center to center at approved locations to control speed, marked with white strips of road marking paint.					
		<b>Unit = sqm</b>					
		Taking output = 100 sqm (including gaps)					
		The rate per sqm of premix carpet and road marking may be adopted from chapter 5 & 8 respectively for the quantities calculated from approved drawings					
8.40	suggestive	<b>High Mast Pole Lighting at Interchanges and Flyovers</b>					
		Providing and erecting a high mast pole lighting with 30 m high hot dip galvanised mast designed to withstand forces exerted with wind speeds of 180 km per hour with 3 seconds gust, as per IS:875 (Part 3) - 1978, fitted with a base flange, door at the base of mast with heavy duty internal lock, lantern carriage, suitable winching arrangement for safe working load of 750 kg and high powered electrically driven power tools for raising and lowering of lantern carriage, flexible 8 core electric cable, lightning conductor, earthing terminal, and fixing 2 nos aviation obstruction lights on top of the mast, all complete as per approved design and drawings					
		This is a specialised work and is generally done by firms who specialise in such jobs. The detailed designs and estimates are submitted by the firms along with their tender for checks by the Department. The cost of this work is required to be worked out based on approved design, drawings and estimate of the lowest tender. A separate contract for this work is concluded as the contractors for road and bridge works generally do not undertake such jobs.					
8.43	suggestive	<b>Portable Barricade in Construction Zone</b>					
		Installation of a steel portable barricade with horizontal rail 300 mm wide, 2.5 m in length fitted on a 'A' frame made with 45 x 45 x 5 mm angle iron section, 1.5 m in height, horizontal rail painted (2 coats) with yellow and white stripes, 150 mm in width at an angle of 450, 'A' frame painted with 2 coats of yellow paint, complete as per IRC:SP:55-2001					
		<b>Unit = each</b>					
		Taking output = one steel portable barricade					
		<b>a) Labour</b>					
		Mate	day	0.020	300.00	6.00	L-12
		Mazdoor	day	0.250	250.00	62.50	L-13
		Painter	day	0.500	400.00	200.00	L-18
		Welder	day	0.250	400.00	100.00	L-02
		<b>b) Material</b>					
		Angle iron 45 x 45 x 5 mm	kg	25.000	57.21	1430.25	M-179 /1000
		MS sheet 300 mm wide, 2.5 m long and 2.6 mm thick	kg	15.000	57.21	858.15	M-179 /1000
		Paint	litre	0.500	198.00	99.00	M-131
		Add 2 per cent of cost of steel for welding consumables, nuts & bolts and drilling holes				45.77	
		<b>c) Overhead charges @ 10 % on (a+b)</b>				280.17	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				308.18	
		<b>Rate per barricade = a+b+c+d</b>				3390.02	
						<b>say</b>	<b>3390.00</b>

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.44	suggestive		<b>Permanent Type Barricade in Construction Zone</b>					
		<b>A</b>	<b>With steel components</b>					
			Construction of a permanent type barricade made of steel components, 1.5 m high from road level, fitted with 3 horizontal rails 200 mm wide and 4 m long on 50 x 50 x 5 mm angle iron vertical support, painted with yellow and white strips, 150 mm in width at an angle of 45°, complete as per IRC:SP:55-2001					
			<b>Unit = each</b>					
			Taking output = one barricade					
			<b>a) Labour</b>					
			Mate	day	0.050	300.00	15.00	L-12
			Mazdoor	day	0.300	250.00	75.00	L-13
			Painter	day	0.600	400.00	240.00	L-18
			Welder	day	0.300	400.00	120.00	L-02
			<b>b) Material</b>					
			Angle iron 50 x 50 x 5 mm, 2 m long, 2 Nos.	kg	15.000	57.21	858.15	M-179 /1000
			MS sheet of 12 SWG, 3 Nos of 200 mm width and 4 m length	kg	50.000	57.21	2860.50	M-179 /1000
			Paint	litre	1.000	198.00	198.00	M-131
			Add 1 per cent of cost of steel for welding consumables, nuts & bolts and drilling holes				74.37	
			<b>c) Overhead charges @ 10 % on (a+b)</b>				444.10	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				488.51	
			<b>Rate per barricade = a+b+c+d</b>				5373.64	
							<b>say</b>	<b><u>5374.00</u></b>
8.44		<b>B</b>	<b>With wooden components</b>					
			Construction of a permanent type barricade made of wooden components, 1.5 m high from road level, fitted with 3 horizontal planks 200 mm wide and 3.66 m long on 100 x 100 mm wooden vertical post, painted with yellow and white strips, 150 mm in width at an angle of 45°, complete as per IRC:SP:55-2001					
			<b>Unit = each</b>					
			Taking output = one barricade					
			<b>a) Labour</b>					
			Mate	day	0.050	300.00	15.00	L-12
			Mazdoor	day	0.300	250.00	75.00	L-13
			Painter	day	0.600	400.00	240.00	L-18
			Carpenter	day	0.600	400.00	240.00	L-04
			<b>b) Material</b>					
			Timber	cum	0.180	15400.00	2772.00	M-185
			Add 1 per cent of cost of timber for nuts & bolts, nails, etc.				27.72	
			<b>c) Overhead charges @ 10 % on (a+b)</b>				336.97	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				370.67	
			<b>Rate per barricade = a+b+c+d</b>				4077.36	
							<b>say</b>	<b><u>4077.00</u></b>
8.44		<b>C</b>	<b>With bricks</b>					
			Construction of a permanent type barricade made with brick work in mud mortar, 1.5 m high, 4 m long, 600 mm thick, plastered with cement mortar 1:6, painted with yellow and white strips					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = each</b>					
		Taking output = one barricade					
		<b>a) Labour</b>					
		Mate	day	0.240	300.00	72.00	L-12
		Mazdoor	day	3.000	250.00	750.00	L-13
		Painter	day	1.000	400.00	400.00	L-18
		Mason	day	2.000	400.00	800.00	L-11
		<b>b) Material</b>					
		Brick	each	1800.000	9.00	16200.00	M-079
		Cement	kg	22.000	8.12	178.64	M-081 /1000
		Sand	cum	0.090	540.00	48.60	M-005
		Paint	litre	1.250	198.00	247.50	M-131
		<b>c) Overhead charges @ 10 % on (a+b)</b>				1869.67	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2056.64	
		<b>Rate per barricade = a+b+c+d</b>				22623.06	
						<b>say</b>	<b>22623.00</b>
8.45	suggestive	<b>Drum Delineator in Construction Zone</b>					
		Provision of metal drum/empty bitumen drum delineator, 300 mm in diameter, 800 mm high, filled with earth for stability, painted in circumferential strips of alternate black and white 100 mm wide fitted with reflectors 3 Nos of 7.5 cm dia, all as per IRC:SP:55-2001					
		<b>Unit = each</b>					
		Taking output = one drum delineator					
		<b>a) Labour</b>					
		Mate	day	0.020	300.00	6.00	L-12
		Mazdoor	day	0.250	250.00	62.50	L-13
		Painter	day	0.250	400.00	100.00	L-18
		<b>b) Material</b>					
		Steel drum 300 mm dia 1.2 m high/empty bitumen drum	each	1.000	60.00	60.00	M-172
		Paint	litre	0.500	198.00	99.00	M-131
		<b>c) Overhead charges @ 10 % on (a+b)</b>				32.75	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				36.03	
		<b>Rate per drum delineator = a+b+c+d</b>				396.28	
						<b>say</b>	<b>396.00</b>
8.46	suggestive	<b>Flagman</b>					
		Positioning of a smart flagman with a yellow vest and a yellow cap and a red flag 600 x 600 mm securely fastened to a staff 1 m in length for guiding the traffic					
		<b>Unit = each</b>					
		Taking output = one flagman					
		<b>a) Labour</b>					
		Mate	day	0.040	300.00	12.00	L-12
		Mazdoor	day	1.000	250.00	250.00	L-13
		<b>b) Material</b>					
		Flag of red color cloth 600 x 600 mm	each	1.000	60.00	60.00	M-099
		Wooden staff for fastening of flag 25 mm dia, one m long	each	1.000	60.00	60.00	M-196
		<b>c) Overhead charges @ 10 % on (a+b)</b>				38.20	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				42.02	
		<b>Rate per flagman = a+b+c+d</b>				462.22	
						<b>say</b>	<b>462.00</b>

## Chapter – 9

### PIPE CULVERTS

**Preamble:**

- 1 Pipe culverts of sizes 1000 mm and 1200 mm dia in single row and double row which are generally used on roads, have been included. Providing and laying of pipe has been included in the rate analysis. Items of auxiliary works such as excavation, bedding, backfilling, concrete and masonry shall be analysed, as provided under the respective sections and paid for separately.
- 2 Analysis has been given separately for NP2 pipes for ease of adoption.
- 3 Cost of any river training and protection work like stone pitching, apron, curtain wall etc. may be analysed under the respective item included in Chapter 16.
- 4 The joining of pipes is proposed by collar joints.
- 5 Chain & pulley for lifting the pipes is considered part of overheads.
- 6 The thickness of first class bedding has been taken as 150 mm. The height of bedding has been taken as 1/10th of overall height of pipe in the analysis. This may be modified as per thickness indicated in the approved drawing.

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	300.00	192.00	L-12
			Mason	day	1.000	400.00	400.00	L-11
			Mazdoor	day	15.000	250.00	3750.00	L-13
			<b>b) Material</b>					
			40mm Aggregate at site	cum	13.800	1250.00	17250.00	M-055
			Sand at site	cum	6.900	540.00	3726.00	M-005
			Cement at site	tonne	3.300	8120.00	26796.00	M-081
			Cost of water	KL	18.000	60.00	1080.00	M-189
			<b>c) Machinery</b>					
			Concrete mixer 0.4/ 0.28 cum	hour	6.000	242.00	1452.00	P&M-009
			Generator set 33 KVA	hour	6.000	407.00	2442.00	P&M-079
			Water tanker 6 KL capacity	hour	3.000	488.00	1464.00	P&M-060
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				5855.20	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				6440.72	
			Cost for 15 cum = a+b+c+d+e				70847.92	
			<b>Rate per cum = (a+b+c+d+e)/15</b>				4723.19	
						<b>say</b>	<b>4723.00</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 NP2 / Prestressed Concrete Pipe on First Class Bedding in Single Row .</b>					
			Laying Reinforced cement concrete pipe NP2/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</b>	<b>1000 mm dia</b>					
			<b>a) Labour</b>					
			Mate	day	0.180	300.00	54.00	L-12
			Mason	day	0.500	400.00	200.00	L-11
			Mazdoor	day	4.000	250.00	1000.00	L-13
			<b>b) Material</b>					
			Sand at site	cum	0.070	540.00	37.80	M-005
			Cement at site	tonne	0.050	8120.00	406.00	M-081
			RCC pipe NP-2/prestressed concrete pipe including	metre	12.500	852.00	10650.00	M-149
			Granular material passing 5.6 mm sieve for bedding	cum	4.500	390.00	1755.00	M-009
			<b>c) Overhead charges @ 10 % on (a+b)</b>				1410.28	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1551.31	
		Cost for 12.5 metres = a+b+c+d				17064.39	
		<b>Rate per metre = (a+b+c+d)/12.5</b>				1365.15	
					<b>say</b>	<b>1365.00</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					
<b>9.2</b>	<b>B</b>	<b>1200 mm dia</b>					
		<b>a) Labour</b>					
		Mate	day	0.280	300.00	84.00	L-12
		Mason	day	1.000	400.00	400.00	L-11
		Mazdoor	day	6.000	250.00	1500.00	L-13
		<b>b) Material</b>					
		Sand at site	cum	0.090	540.00	48.60	M-005
		Cement at site	tonne	0.070	8120.00	568.40	M-081
		RCC pipe NP-2/prestressed concrete pipe including collar at site	metre	12.500	1155.00	14437.50	M-150
		Granular material passing 5-6 mm sieve for class bedding	cum	5.000	390.00	1950.00	M-009
		<b>c) Overhead charges @ 10 % on (a+b)</b>				1898.85	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2088.74	
		Cost for 12.5 metres = a+b+c+d				22976.09	
		<b>Rate per metre= (a+b+c+d)/12.5</b>				1838.09	
					<b>say</b>	<b>1838.00</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					
<b>9.3</b>	<b>2900</b>	<b>Laying Reinforced Cement Concrete Pipe NP2 / Prestressed Concrete Pipe on First Class Bedding in Double Row .</b>					
		Laying Reinforced cement concrete pipe NP2 / 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	300.00	108.00	L-12
		Mason	day	1.000	400.00	400.00	L-11
		Mazdoor	day	8.000	250.00	2000.00	L-13
		<b>b) Material</b>					
		Sand at site	cum	0.140	540.00	75.60	M-005
		Cement at site	tonne	0.100	8120.00	812.00	M-081
		RCC pipe NP-2/prestressed concrete pipe including collar at site	metre	25.000	852.00	21300.00	M-149
		Granular material passing 5.6 mm sieve for bedding	cum	12.500	390.00	4875.00	M-009

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Overhead charges @ 10 % on (a+b)				2957.06	
		d) Contractor's profit @ 10 % on (a+b+c)				3252.77	
		Cost for 12.5 metres = a+b+c+d				35780.43	
		Rate per metre = (a+b+c+d)/12.5				2862.43	
		<b>Note</b>			<b>say</b>	<b>2862.00</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					
<b>9.3</b>	<b>B</b>	<b>1200 mm dia</b>					
		a) Labour					
		Mate	day	0.560	300.00	168.00	L-12
		Mason	day	2.000	400.00	800.00	L-11
		Mazdoor	day	12.000	250.00	3000.00	L-13
		b) Material					
		Sand at site	cum	0.180	540.00	97.20	M-005
		Cement at site	tonne	0.140	8120.00	1136.80	M-081
		RCC pipe NP-2 /prestressed concrete pipe including collar at site	metre	25.000	1155.00	28875.00	M-150
		Granular material passing 5-6 mm sieve for class bedding	cum	13.750	390.00	5362.50	M-009
		c) Overhead charges @ 10 % on (a+b)				3943.95	
		d) Contractor's profit @ 10 % on (a+b+c)				4338.35	
		Cost for 12.5 metres = a+b+c+d				47721.80	
		Rate per metre= (a+b+c+d)/12.5				3817.74	
		<b>Note</b>			<b>say</b>	<b>3818.00</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					

## Chapter – 10

### MAINTENANCE OF ROADS

#### Preamble:

- 1 In the case of rain cuts, it has been assumed that some material cut by rain, approximately 25 per cent will be available at site which can be retrieved and re-used and the balance 75 per cent is required to be provided as fresh material.
- 2 For making up earthen shoulders, it has been assumed that on an average 150 mm filling will be required. Similarly, for stripping of excess soil from shoulder, an average depth of 75 mm has been assumed.
- 3 In the case of chocking of drain, it has been assumed that half the depth of drain has been filled with earth/debris, which requires clearance.
- 4 During the process of landslide clearance on hill roads, it has been assumed that earth will be disposed off by dozer on the valley side. In case there is any objection to this arrangement due to particular site conditions, resources like loader and tipper will have to be provided for disposal of earth/debris for the lead involved.
- 5 The item like slurry seal, fog spray, crack prevention courses, surface dressing for maintenance works have already been included in chapter 5 and are not being repeated in this chapter.
- 6 The cost of other items like repair of ruts and undulation maintenance of earthen shoulders, cross drainage works, minor and major bridges and miscellaneous items like turfing and arboriculture, painting and lettering on km stones, repair to signage, repair to footpath, street lighting, railing dividers, separators and under passes for pedestains has been given in the "Report of the Committee on Norms for Maintenance of Roads In India" Published by IRC in January 2001 which may be referred for guidance.
- 7 The repair items related to bridges have been given in chapter 16

CHAPTER- 10								
MAINTENANCE OF ROADS								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
10.1	3002		<b>Restoration of Rain Cuts</b>					
			Restoration of rain cuts with soil, moorum, gravel or a mixture of these, clearing the loose soil, benching for 300 mm width, laying fresh material in layers not exceeding 250 mm and compacting with plate compactor or power rammers to restore the original alignment, levels and slopes					
			<b>Unit = cum</b>					
			<b>Taking output = 10 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.080	300.00	24.00	L-12
			Mazdoor	day	2.000	250.00	500.00	L-13
			<b>b) Machinery</b>					
			Excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.130	1571.00	204.23	P&M-026
			Tipper ( L is average lead in km for borrow earth)	tonne.km	12 x L	24.00	864.00	Lead =3 km & P&M-058
			Add 10 per cent of cost of carriage towards loading and unloading charges.				86.40	
			Plate compactor	hour	0.500	303.00	151.50	P&M-086
			<b>c) Overhead charges @ 10 % on (a+b)</b>				183.01	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				201.31	
			Cost for 10 cum = a+b+c+d				2214.46	
			<b>Rate per cum = (a+b+c+d)/10</b>				221.45	
							<b>say</b>	<b>221.00</b>
		<b>Note</b>	Only 75 per cent of fresh material has been provided as 25 per cent can be retrieved at site from earth that is flown down the slope in the form of slurry and deposited at the foot of there in cuts					
10.2	3003		<b>Maintenance of Earthen Shoulder (filling with fresh soil)</b>					
			Making up loss of material/ irregularities on shoulder to the design level by adding fresh approved soil and compacting it with appropriate equipment.					
			<b>Unit = sqm</b>					
			<b>Taking output = 100 sqm</b>					
			Assuming average thickness of filling to be 150 mm					
			Quantity of fresh material = 15 cum					
			<b>a) Labour</b>					
			Mate	day	0.180	300.00	54.00	L-12
			Mazdoor	day	4.500	250.00	1125.00	L-13
			<b>b) Machinery</b>					
			Excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.250	1571.00	392.75	P&M-026
			Tipper ( L is average lead in km for borrow earth)	tonne.km	24xL	24.00	1728.00	Lead =3 km & P&M-058
			Add 10 per cent of cost of transportation to cover cost of loading and unloading				172.80	
			Plate compactor @ 25 sqm per hour	hour	12.000	303.00	3636.00	P&M-086
			<b>c) Overhead charges @ 10 % on (a+b)</b>				710.86	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				781.94	
			Cost for 100 sqm = a+b+c+d				8601.35	
			<b>Rate per sqm = (a+b+c+d)/100</b>				86.01	
							<b>say</b>	<b>86.00</b>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
10.3	3003	<b>Maintenance of Earth Shoulder (stripping excess soil)</b>					
		Stripping excess soil from the shoulder surface to achieve the approved level and compacting with plate compactor					
		<b>Unit = sqm</b>					
		<b>Taking output = 100 sqm</b>					
		Assuming average depth of stripping as 75 mm					
		Quantity of earth cutting involved = 7.5 cum					
		<b>a) Labour</b>					
		Mate	day	0.100	300.00	30.00	L-12
		Mazdoor	day	2.500	250.00	625.00	L-13
		<b>b) Machinery</b>					
		Plate compactor @ 25 sqm per hour	hour	4.000	303.00	1212.00	P&M-086
		<b>c) Overhead charges @ 10 % on (a+b)</b>				186.70	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				205.37	
		Cost for 100 sqm = a+b+c+d				2259.07	
		<b>Rate per sqm on = (a+b+c+d)/100</b>				22.59	
					<b>say</b>	<b>23.00</b>	
		<b>Note</b>					
		The earth stripped from earthen shoulders to be dumped on the side slopes locally for disposal.					
10.4	3004.2	<b>Filling Pot-holes and Patch Repairs with open-Graded Premix surfacing, 20mm.</b>					
		Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 511, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2					
		<b>Unit = Sqm</b>					
		<b>Taking out put = 10250 sqm (205 cum)(405 tonne)</b>					
		<b>a) Labour</b>					
		Mate	Day	3.760	300.00	1128.00	L-12
		Mazdoor	Day	90.000	250.00	22500.00	L-13
		Mazdoor skilled	Day	4.000	400.00	1600.00	L-15
		<b>b) Machinery</b>					
		Air compressor 250 cfm	hour	6.000	516.00	3096.00	P&M-001
		HMP 100-110 TPH Capacity	hour	6.000	25579.00	153474.00	P&M-021
		Tipper 10 tonnes capacity	hour	45.000	609.00	27405.00	P&M-048
		Smooth wheeled roller 8-10 tonnes	hour	12.000	504.00	6048.00	P&M-044
		<b>c) Material</b>					
		Crushed stone aggregates nominal size 13.2mm	cum	184.500	1700.00	313650.00	M-052
		Crushed stone aggregates nominal size 11.2mm	cum	92.250	1750.00	161437.50	M-051
		Bitumen 80/100	tonne	14.970	48810.00	730685.70	M-075
		Bitumen emulsion for tack coat including vertical sides of pot hole.	tonne	2.460	39586.00	97381.56	M-077
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				151840.58	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				167024.63	
		Cost for 10250 sqm = a+b+c+d+e				1837270.97	
		<b>Rate per sqm = (a+b+c+d+e)/10250</b>				179.25	
					<b>say</b>	<b>179.00</b>	
10.5	3004.2	<b>Filling Pot-holes and Patch Repairs with Bituminous concrete, 40mm.</b>					
		Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 504, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = Sqm</b>					
		<b>Taking out put = 4900 sqm (196 cum)(450 Tonnes)</b>					
		<b>a) Labour</b>					
		Mate	Day	2.920	300.00	876.00	L-12
		Mazdoor	Day	70.000	250.00	17500.00	L-13
		Mazdoor skilled	Day	3.000	400.00	1200.00	L-15
		<b>b) Machinery</b>					
		Air compressor 250 cfm	hour	6.000	516.00	3096.00	P&M-001
		HMP 100-110 TPH Capacity	hour	6.000	18917.00	113502.00	P&M-022
		Tipper 10 tonnes capacity	hour	45.000	609.00	27405.00	P&M-048
		Smooth wheeled roller 8-10 tonnes	hour	12.000	504.00	6048.00	P&M-044
		<b>c) Material</b>					
		i) Bitumen	tonne	22.500	48810.00	1098225.00	M-075
		ii) Bitumen emulsion for tack coat .	tonne	1.180	39586.00	46711.48	M-077
		iii) Aggregates					
		<b>Grading I - 19mm(Nominal size)</b>					
		20-10mm 35 per cent	cum	99.750	1650.00	164587.50	M-051,M-052,M-053 and M-054
		10-5 mm 23 per cent	cum	65.550	650.00	42607.50	M-025
		5mm and below40 per cent	cum	114.000	773.00	88122.00	M-021,M-022 and M-024
		Add 5 per cent for wastage				14765.85	
		or					
		<b>Grading-II 13mm (Nominal size)</b>					
		13.2-10 mm 30 per cent	cum	85.500	1725.00	147487.50	M-051 and M-052
		10-5 mm 25 per cent	cum	71.250	650.00	46312.50	M-025
		5 mm and Below43 per cent	cum	122.550	773.00	94731.15	M-021,M-022 and M-024
		Filler 2 per cent	tonne	9.000	11550.00	103950.00	M-188
		Add 5 per cent for wastage				19624.06	
		Any one of the above alternatives of aggregate i.e. 19mm or 13mm nominal size may be adopted as per approved design.					
10.5	(i)	<b>for grading I Material</b>					
		d) Overhead charges @ 10 % on (a+b+c)				162464.63	
		e) Contractor's profit @ 10 % on (a+b+c+d)				178711.10	
		Cost for 4900 cum = a+b+c+d+e				1965822.06	
		Rate per cum = (a+b+c+d+e)/4900				401.19	
						<b>say</b>	<b>401.00</b>
10.5	(ii)	<b>for grading II Material</b>					
		d) Overhead charges @ 10 % on (a+b+c)				172666.87	
		e) Contractor's profit @ 10 % on (a+b+c+d)				189933.56	
		Cost for 4900 cum = a+b+c+d+e				2089269.11	
		Rate per cum = (a+b+c+d+e)/4900				426.38	
						<b>say</b>	<b>426.00</b>
		<b>Note</b>					
		For detailed working of quantities of aggregates, refer item 5.8 of chapter 5					
10.6	3004.3.3	<b>Crack Filling</b>					
		Filling of crack using slow - curing bitumen emulsion and applying crusher dust in case crack are wider than 3mm.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = Running Meter</b>					
		<b>Taking out put = 500m</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	300.00	12.00	L-12
		Mazdoor	day	1.000	250.00	250.00	L-13
		<b>b) Material</b>					
		Slow-curing bitumen emulsion	Kg	33.000	40.00	1320.00	M-077
		Stone crusher dust	cum	0.020	560.00	11.20	M-021
		<b>c) Overhead charges @ 10 % on (a+b)</b>				159.32	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				175.25	
		Cost for 500sqm = a+b+c+d				1927.77	
		<b>Rate per meter = (a+b+c+d+e)/500</b>				3.86	
					<b>say</b>	<b><u>4.00</u></b>	
10.7	3004.4	<b>Dusting</b>					
		Applying crusher dust to areas of road where bleeding of excess bitumen has occurred.					
		<b>Unit = Sqm</b>					
		<b>Taking output = 3500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	300.00	24.00	L-12
		Mazdoor	day	2.000	250.00	500.00	L-13
		<b>b) Material</b>					
		Stone crusher dust finer than 3mm with not more than 10 per cent passing 0.075 sieve.	cum	6.250	560.00	3500.00	M-021
		<b>c) Overhead charges @ 10 % on (a+b)</b>				402.40	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				442.64	
		Cost for 3500sqm = a+b+c+d				4869.04	
		<b>Rate per meter = (a+b+c+d)/3500</b>				1.39	
					<b>say</b>	<b><u>1.39</u></b>	
10.8	(A) 3004.3.2	<b>Fog Seal</b>					
	(B) 3004.3.4	<b>Crack Prevention courses.</b>					
	(C) 3004.5	<b>Slurry Seal</b>					
	(D) 3004.6	<b>Surface Dressing for maintenance works.</b>					
		The above mentioned items have already been included in Chapter 5.					
10.9	3005.1	<b>Repair of Joint Grooves with Epoxy Mortar</b>					
		Repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints in concrete pavements using epoxy mortar or epoxy concrete					
		<b>Unit = running metre</b>					
		<b>Taking output = 10 metres</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	300.00	12.00	L-12
		Mazdoor	day	0.500	250.00	125.00	L-13
		Chiseller	day	0.500	300.00	150.00	L-05
		<b>b) Material</b>					
		Epoxy primer	kg	2.500	121.00	302.50	M-097
		Epoxy compound with accessories for preparing epoxy mortar	kg	10.000	220.00	2200.00	M-095

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Air compressor 250 cfm for cleaning	hour	0.050	516.00	25.80	P&M-001
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				281.53	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				309.68	
		Cost for 10 metres = a+b+c+d+e				3406.51	
		<b>Rate per metre = (a+b+c+d+e)/10</b>				340.65	
					<b>say</b>	<b>341.00</b>	
10.10	3005.2	<b>Repair of old Joints Sealant</b>					
		Removal of existing sealant and re sealing of contraction, longitudinal or expansion joints in concrete pavement with fresh sealant material					
		<b>Unit = running metre</b>					
		<b>Taking output = 10 metres</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	300.00	12.00	L-12
		Mazdoor	day	0.500	250.00	125.00	L-13
		<b>b) Material</b>					
		Primer	kg	0.250	170.00	42.50	M-146
		Sealant	kg	1.000	302.00	302.00	M-120
		<b>c) Machinery</b>					
		Air compressor 250 cfm for cleaning	hour	0.050	516.00	25.80	P&M-001
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				50.73	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				55.80	
		Cost for 10 metres = a+b+c+d+e				613.83	
		<b>Rate per metre = (a+b+c+d+e)/10</b>				61.38	
					<b>say</b>	<b>61.00</b>	
10.11	3000	<b>Hill Side Drain Clearance</b>					
		Removal of earth from the choked hill side drain and disposing it on the valley side manually					
		<b>Unit = running metre</b>					
		<b>Taking output = 10 metres</b>					
		Assuming muck causing choking of drain to be 0.2 cum per metre, quantity of earth to be removed for 10 metres = 2 cum					
		<b>a) Labour</b>					
		Mate	day	0.080	300.00	24.00	L-12
		Mazdoor	day	1.000	250.00	250.00	L-13
		<b>b) Overhead charges @ 10 % on (a+b)</b>				27.40	
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				30.14	
		Cost for 10 metres = a+b+c				331.54	
		<b>Rate per metre = (a+b+c)/10</b>				33.15	
					<b>say</b>	<b>33.00</b>	
10.12	3000	<b>Land Slide Clearance in soil</b>					
		(i) Clearance of land slides in soil and ordinary rock by a bulldozer D 80 A-12, 180 HP and disposal of the same on the valley side					
		<b>Unit = cum</b>					
		<b>Taking output = 100 cum</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.040	300.00	12.00	L-12
		Mazdoor	day	1.000	250.00	250.00	L-13
		b) Machinery					
		Dozer 180 HP @ 60 cum per hour	hour	1.670	3615.00	6037.05	P&M-014
		c) Overhead charges @ 10 % on (a+b)				629.91	
		d) Contractor's profit @ 10 % on (a+b+c)				692.90	
		Cost for 100 cum = a+b+c+d				7621.85	
		Rate per cum = (a+b+c+d)/100				76.22	
					say	<u>76.00</u>	
		<b>Note</b>					
		Land Slide clearance involves pushing of loose earth slid on the road surface from hill face on the valley side. Since no cutting of original ground is involved, the output of dozer has been taken as 60 cum per hour for soil, ordinary rock and blasted hard rock. However, if there are objection to disposing of earth on valley side, additional resources for its disposal shall be considered as per site conditions.					
		(ii)					
		Clearance of land slides in soil and ordinary rock by a bulldozer D 50 A-15 and disposal of the same on the valley side					
		<i>Unit = cum</i>					
		<i>Taking output = 100 cum</i>					
		a) Labour					
		Mate	day	0.040	300.00	12.00	L-12
		Mazdoor	day	1.000	250.00	250.00	L-13
		b) Machinery					
		Dozer D 50 A-15	hour	1.670	2632.00	4395.44	P&M-014
		c) Overhead charges @ 10 % on (a+b)				465.74	
		d) Contractor's profit @ 10 % on (a+b+c)				512.32	
		Cost for 100 cum = a+b+c+d				5635.50	
		Rate per cum = (a+b+c+d)/100				56.36	
					say	<u>56.00</u>	
10.13	3000	<b>Landslide Clearance in Hard Rock Requiring Blasting</b>					
		Clearing of land slide in hard rock requiring blasting for 50 per cent of the boulders and disposal of the same on the valley side (Boll Dozer D 50)					
		<i>Unit = cum</i>					
		<i>Taking output = 100 cum</i>					
		a) Labour					
		Mate	day	0.090	300.00	27.00	L-12
		Mazdoor	day	1.500	250.00	375.00	L-13
		Driller	day	0.750	300.00	225.00	L-06
		Blaster	day	0.070	300.00	21.00	L-03
		b) Machinery					
		Dozer D 50 @ 60 cum per hour	hour	1.670	2632.00	4395.44	P&M-014
		Air compressor 250 cfm with two jack hammer	hour	2.500	516.00	1290.00	P&M-001
		c) Materials					
		Gelatine 80 per cent @ 35 kg per 100 cum	kg	17.500	148.00	2590.00	M-104
		Electric Detonators @ 1 Detonator for 2 Gelatine sticks of 125 gms each	each	70.000	9.90	693.00	M-094 /100
		c) Overhead charges @ 10 % on (a+b)				961.64	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Contractor's profit @ 10 % on (a+b+c)				1057.81	
		Cost for 100 cum = a+b+c+d+e				11635.89	
		Rate per cum = (a+b+c+d+e)/100				116.36	
					say	<u>116.00</u>	
		<b>Note</b> Credit for the rock if found acceptable as construction material shall be afforded					
10.14	3000	<b>Snow Clearance on Roads with Dozer</b>					
		Snow clearance from road surface by a bull- dozer 165 Hp and disposing it on the valley side					
		<i>Unit = cum</i>					
		<i>Taking output = 5000 cum</i>					
		a) Labour					
		Mate	day	0.080	300.00	24.00	L-12
		Mazdoor	day	2.000	250.00	500.00	L-13
		b) Machinery					
		Dozer D-50 @ 850 cum per hour	hour	5.880	2632.00	15476.16	P&M-014
		c) Overhead charges @ 10 % on (a+b)				1600.02	
		d) Contractor's profit @ 10 % on (a+b+c)				1760.02	
		Cost for 5000 cum = a+b+c+d				19360.19	
		Rate per cum = (a+b+c+d)/5000				3.87	
					say	<u>4.00</u>	
		<b>Note</b> i) Labour provided will not be cutting the snow. They will be guiding the dozer operator on the alignment of the road as entire surface gets covered with snow and the edges of the road are not visible and for changing the blade angle. Also they will keep a watch on the hill side for any eventuality of avalanches, slide etc					

10.15	1900	<b>Maintenance of WBM Road</b>					
		Maintenance of WBM road including filling up of pot holes, ruts and rectifying corrugated surface, damaged edges and ravelling as per technical specification clause 1906.					
		<i>Unit = Sqm.</i>					
		<i>Taking output = affected area @ 5% in 1 km = 1000 x 3.75 x 0.05 = 187.5 Sqm.</i>					
		<i>Quantity = 187.5 x 0.075 = 14.06 cum</i>					
		a) Rate as per item No. 4.9 A (a)	cum	14.060	974.00	13694.44	
		b) Add 50% for Extra efforts involved on maintenance to be done in small reaches				6847.22	
		Cost for 187.5 Sqm. = a+b				20541.66	
		Rate per Sqm = (a+b)/187.5				109.56	
					say	<u>110.00</u>	

**Note :** The cost of 25% retrived material may be deducted from rates.

10.16		<b>Maintenance of Hume Pipe</b>					
		Maintenance of Hume Pipe Culvert by way of Cleaning, Clearing, Erosion repair, repairs to cracks, parapet wall and protection work as per drawing and technical specification Clause 1908.					
		<i>Unit = One No. Hume Pipe (1000 mm dia)</i>					
		<i>Taking output = One No. H. P. Culvert</i>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.100	300.00	30.00	L-12
		Mazdoor (Unskilled)	day	1.000	250.00	250.00	L-13
		Mason 2nd Class	day	1.400	300.00	420.00	
		b) Material					
		Cement, Sand, Brick, Boulder etc.	L.S.			200.00	P&M-014
		c) Overhead charges @ 10 % on (a+b)				90.00	
		d) Contractor's profit @ 10 % on (a+b+c)				99.00	
		Cost for one No., Hume Pipe Culvert = a+b+c+d				1089.00	
		Rate per Hume Pipe Culvert = (a+b+c+d)				1089.00	
						say	<u>1089.00</u>

10.17		<b>Maintenance of Culverts Slab type</b>					
		Maintenance of Slab type Culvert by way of Cleaning, Clearing, Erosion repair, repairs to cracks, parapet wall and protection work as per drawing and technical specification Clause 1908.					
		<b>Unit = One No. Culvert (2 m span)</b>					
		<b>Taking output = One No. Slab Culvert</b>					
		a) Labour					
		Mate	day	0.200	300.00	60.00	L-12
		Mazdoor (Unskilled)	day	4.000	250.00	1000.00	L-13
		Mason 2nd Class	day	1.000	300.00	300.00	
		b) Material					
		Cement, Sand, Brick, Boulder etc.	L.S.			500.00	P&M-014
		c) Overhead charges @ 10 % on (a+b)				186.00	
		d) Contractor's profit @ 10 % on (a+b+c)				204.60	
		Cost for one No., Slab Culvert = a+b+c+d				2250.60	
		Rate per Slab Culvert = (a+b+c+d)				2250.60	
						say	<u>2251.00</u>

10.18		<b>Maintenance of Causeway</b>					
		Maintenance of Causeway by way of minor Surface repairs, replacing Guide Posts, repair of flood gauges, removal of debris, providing boulders and protection work and painting as per technical specifications Clause 1909.					
		<b>Unit = One metre</b>					
		<b>Taking output = 50 metre causeway</b>					
		a) Labour					
		Mate	day	0.800	300.00	240.00	L-12
		Mazdoor (Unskilled)	day	1.600	250.00	400.00	L-13
		Mason 1st Class/Painter 1st Class	day	4.000	400.00	1600.00	
		b) Material					
		Cement, Sand, Brick, Boulder etc.	L.S.			350.00	P&M-014
		c) Overhead charges @ 10 % on (a+b)				259.00	
		d) Contractor's profit @ 10 % on (a+b+c)				284.90	
		Cost for 50 metre = a+b+c+d				3133.90	
		Rate per metre = (a+b+c+d)/50				62.68	
						say	<u>63.00</u>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
10.19		<b>Maintenance of Road signs</b>					
		Maintenance of Road signs by way of cleaning and repainting of mandatory/regulatory/cautionary/informatory and place identifications sign board as per drawings and technical specifications Clause 1910.					
		<i>Unit = 1 km</i>					
		<i>Taking output = one km</i>					
		<i>All types of signs in one km</i>					
		<b>a) Labour</b>					
		Mate	day	0.090	300.00	27.00	L-12
		Mazdoor (Unskilled)	day	2.000	250.00	500.00	L-13
		Painter 1st Class	day	0.125	400.00	50.00	
		<b>b) Material</b>					
		Cement, Sand, Brick, Boulder etc.	L.S.			300.00	P&M-014
		<b>c) Overhead charges @ 10 % on (a+b)</b>				87.70	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				96.47	
		Cost for one km = a+b+c+d				1061.17	
		<b>Rate per km = (a+b+c+d)</b>				1061.17	
						<b>say</b>	<b>1061.00</b>

10.20	1900	<b>Cutting of branches of trees shrubs and trimming of grass and weeds</b>					
		(i) Cutting of branches of trees and shrubs from the road way or with in R.O.W. including disposal of wood and leaves to suitable location as per technical specification Clause 1914.					
		<i>Unit = 1 tree</i>					
		<i>Taking output = 10 trees of 900 mm average girth</i>					
		<b>a) Labour</b>					
		Mate	day	0.120	300.00	36.00	L-12
		Mazdoor (Skilled)	day	1.000	400.00	400.00	L-15
		Mazdoor (Unskilled)	day	2.000	250.00	500.00	L-13
		<b>b) Overhead charges @ 10 % on (a)</b>				93.60	
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				102.96	
		Cost for 10 trees = a+b+c				1132.56	
		<b>Rate per tree= (a+b+c)/10</b>				113.26	
						<b>say</b>	<b>113.00</b>
		(ii) Cutting of shrubs from the road way or with in R.O.W. and disposal of shrubs to suitable location as per technical specification Clause 1914.					
		<i>Unit = Each</i>					
		<i>Taking output = 100 nos. shrubs</i>					
		<b>a) Labour</b>					
		Mate	day	0.080	300.00	24.00	L-12
		Mazdoor (Unskilled)	day	2.000	250.00	500.00	L-13
		<b>b) Overhead charges @ 10 % on (a)</b>				52.40	
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				57.64	
		Cost for 100 shrubs = a+b+c				634.04	
		<b>Rate per shrub= (a+b+c)/100</b>				6.34	
						<b>say</b>	<b>6.00</b>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	(iii)	Trimming of grass and weeds from the shoulders/berms and disposing off the same to suitable locations as per technical specifications Clause 1914.					
		<b>Unit = Sqm.</b>					
		<b>Taking output = 1500 Sqm.</b>					
		<b>a) Labour</b>					
		Mate	day	0.400	300.00	120.00	L-12
		Mazdoor (Unskilled)	day	10.000	250.00	2500.00	L-13
		<b>b) Overhead charges @ 10 % on (a)</b>				262.00	
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				288.20	
		Cost for 1500 sqm = a+b+c				3170.20	
		<b>Rate per sqm = (a+b+c)/1500</b>				2.11	
						<b>say</b>	<b><u>2.00</u></b>

10.21		<b>White washing of parapet walls of CD work and tree trunks</b>					
		White washing two coats on parapet walls and tree trunks including preparation of surface by cleaning scraping etc. as per technical specifications Clause 1915.					
		<b>Unit = sqm.</b>					
		<b>Taking output = 9 sqm.</b>					
		<b>a) Labour</b>					
		Mate	day	0.010	300.00	3.00	L-12
		Mazdoor (Unskilled)	day	0.143	250.00	35.75	L-13
		Mazdoor (White washer)	day	0.143	250.00	35.75	L-13
		<b>b) Material</b>					
		Lime	quintel	0.045	1155.00	51.98	
		Fevicol adhesive	kg	0.100	135.00	13.50	
		Indigo	kg	0.013	130.00	1.69	
		<b>c) Overhead charges @ 10 % on (a+b)</b>				12.65	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				15.43	
		Cost for 9 sqm = a+b+c+d				169.74	
		<b>Rate per sqm = (a+b+c+d)/9</b>				18.86	
						<b>say</b>	<b><u>19.00</u></b>

**Note :** For analysis of rates for maintenance works bitumen grade S-90 has been taken. User may modify as per site requirements.

## Chapter – 11 HORTICULTURE

### Preamble:

1. The items of turfing with sods and seeding and mulching have been included in the chapter of earthwork.
2. The rates for grassing of lawns and hedges has been included, as the same may be needed for resting places on highways.
3. Five types of tree guards as under have been provided -
  - a) Half brick circular type
  - b) Tree guards made from empty bitumen drums 1.30 m high.
  - c) Tree guards made from empty bitumen drums 2.00 m high.
  - d) Tree guards with MS flat iron.
  - e) Tree guards with MS angle and 3 mm steel wire welded on MS flat and bolted to angle iron posts.
4. Selection from above may be made as per actual situation and design.
5. Rates for wrought iron and mild welded work has been included to cater for any miscellaneous work in connection with horticulture, fencing and traffic sign.
6. Though the estimate for compensatory afforestation is made by the forest department, the rate for this item has been analysed and included for the purpose of estimation.
7. As grass and plantation need more care, one mate has been provided for every 10 mazdoors in case of horticulture.

CHAPTER-11								
HORTICULTURE								
Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
11.1	307	<b>Spreading of Sludge Farm Yard Manure or/and good Earth</b>						
		Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)						
		<b>Unit = cum</b>						
		<b>Taking output = 15 cum</b>						
		<b>a) Labour</b>						
		Mate	day	0.040	300.00	12.00	L-12	
		Mazdoor	day	1.000	250.00	250.00	L-13	
		<b>b) Overhead charges @ 10 % on (a)</b>				26.20		
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				28.82		
		Cost for 15 cum = a+b+c				317.02		
		<b>Rate per cum = (a+b+c)/15</b>				21.13		
							<b>say</b>	<b>21.00</b>
11.2	307	<b>Grassing with 'Doobs' Grass</b>						
		Grassing with 'Doobs' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed						
		<b>Unit = sqm</b>						
		<b>Taking output = 100 sqm</b>						
		<b>(i) In rows 15 cm apart in either direction</b>						
		<b>a) Labour</b>						
		Mate	day	0.170	300.00	51.00	L-12	
		Mazdoor for grassing	day	0.750	250.00	187.50	L-13	
		Mazdoor for maintenance for 30 days	day	1.000	250.00	250.00	L-13	
		<b>b) Machinery</b>						
		Water tanker 6 KL capacity	hour	0.500	488.00	244.00	P&M-060	
		<b>c) Material</b>						
		Doob grass	kg	100.000	13.00	1300.00	M-112	
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				203.25		
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				223.58		
		Cost for 100 sqm = a+b+c+d+e				2459.33		
		<b>Rate per sqm = (a+b+c+d+e)/100</b>				24.59		
							<b>say</b>	<b>25.00</b>
11.2		<b>(ii) In rows 7.5 cm apart in either direction</b>						
		<b>a) Labour</b>						
		Mate	day	0.220	300.00	66.00	L-12	
		Mazdoor for grassing.	day	1.250	250.00	312.50	L-13	
		for maintenance for 30 days	day	1.000	250.00	250.00	L-13	
		<b>b) Machinery</b>						
		Water tanker 6 KL capacity	hour	0.750	488.00	366.00	P&M-060	
		<b>c) Material</b>						
		Doob grass	kg	200.000	13.00	2600.00	M-112	
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				359.45		
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				395.40		
		Cost for 100 sqm = a+b+c+d+e				4349.35		
		<b>Rate per sqm = (a+b+c+d+e)/100</b>				43.49		
							<b>say</b>	<b>43.00</b>
		<b>Note</b>						
		In the case of horticulture one mate has been provided for every 10 mazdoors as maintenance of grass and plants require more care.						
11.3	307	<b>Making Lawns including Ploughing and Dragging with 'Swagha' Breaking of Clod</b>						
		Making lawns including ploughing and breaking of clod, removal of rubbish, dressing and supplying doobs grass roots and planting at 15 cm apart, including supplying and spreading of farm yard manure at rate of 0.18 cum per 100 sqm						



			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)						
11.6	307		<b>Maintenance of Lawns with Fine Grassing for the First Year</b>						
			Maintenance of lawns with fine grassing for the first year including watering etc						
			<i>Unit = sqm</i>						
			<i>Taking output = 100 sqm</i>						
			a) Labour						
			Mali	day	10.000	300.00	3000.00		L-09
			b) Machinery						
			Water tanker6 KL capacity	hour	20.000	488.00	9760.00		P&M-060
			c) Material						
			Cost of water	KL	60.000	60.00	3600.00		M-189
			d) Overhead charges @ 10 % on (a+b+c)				1636.00		
			e) Contractor's profit @ 10 % on (a+b+c+d)				1799.60		
			Cost for 100 sqm = a+b+c+d+e				19795.60		
			Rate per sqm = (a+b+c+d+e)/100				197.96		
							say	<u>198.00</u>	
11.7	307		<b>Planting and Maintaining of Permanent Hedges</b>						
		(a)	<b>Planting permanent hedges including digging of trenches</b>						
			Planting permanent hedges including digging of trenches, 60 cm wide and 45 cm deep, refilling the excavated earth mixed with farmyard manure, supplied at the rate of 4.65 cum per 100 metres and supplying and planting hedge plants at 30 cm apart						
			<i>Unit = Running metre</i>						
			<i>Taking output = 100metre</i>						
			a) Labour						
			Mate	day	1.400	300.00	420.00		L-12
			Mazdoor for digging of trench 60 cm wide and 45 cm deep	day	10.000	250.00	2500.00		L-13
			Mazdoor for refilling the excavated earth mixed with cow dung, preparation of ground and digging of plant, from the nursery carriage to site and planting in position	day	4.000	250.00	1000.00		L-13
			b) Machinery						
			Water tanker6 KL capacity	hour	0.500	488.00	244.00		P&M-060
			c) Material						
			Cost of hedge plants 2 rows at 30 cm apart	each	2x340	7.70	5236.00		M-116
			Supply of farm yard manure at site of work	cum	4.670	121.00	565.07		M-167
			Pesticide	kg	0.250	308.00	77.00		M-136
			Cost of water	KL	3.000	60.00	180.00		M-189
			d) Overhead charges @ 10 % on (a+b+c)				1022.21		
			e) Contractor's profit @ 10 % on (a+b+c+d)				1124.43		
			Cost for 100 metres = a+b+c+d+e				12368.70		
			Rate per metre = (a+b+c+d+e)/100				123.69		
							say	<u>124.00</u>	
		(b)	<b>Maintenance of hedge for one year</b>						
			<i>Unit = Running metre</i>						
			<i>Taking output = 100 m</i>						
			a) Labour						
			Mate	day	3.000	300.00	900.00		L-12
			Mazdoor	day	30.000	250.00	7500.00		L-13
			b) Machinery						
			Water tanker6 KL capacity	hour	5.000	488.00	2440.00		P&M-060

			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)						
			<b>c) Material</b>						
			Manure sludge/Farm yard manure	cum	2.000	121.00	242.00		M-167
			Pesticide	kg	0.500	308.00	154.00		M-136
			Cost of water	KL	30.000	60.00	1800.00		M-189
			Cost of hedge plants @ 10 per cent casualty	each	68.000	7.70	523.60		M-116
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				1355.96		
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				1491.56		
			Cost for 100 metres = a+b+c+d+e				16407.12		
			<b>Rate per metre = a+b+c+d+e)/100</b>				164.07		
								<b>say</b>	<b><u>164.00</u></b>
11.8	307		<b>Planting and Maintaining of Flowering Plants and Shrubs</b>						
		(a)	<b>Planting flowering plants and shrubs in central verge</b>						
			<i>Unit = Running metres 200 plants and 800 shrubs in two rows in one km length of road where width of verge is 3m and above.</i>						
			<i>Taking output = 1000 metres</i>						
			<b>a) Labour</b>						
			Mate	day	1.200	300.00	360.00		L-12
			Mazdoor	day	12.000	250.00	3000.00		L-13
			<b>b) Machinery</b>						
			Water tanker6 KL capacity	hour	6.000	488.00	2928.00		P&M-060
			<b>c) Material</b>						
			Plants	each	200.000	13.00	2600.00		M-100
			Shrubs	each	800.000	11.00	8800.00		M-166
			Manure sludge/Farm yard manure	cum	63.640	121.00	7700.44		M-167
			Pesticide	kg	0.500	308.00	154.00		M-136
			Cost of water	KL	36.000	60.00	2160.00		M-189
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				2770.24		
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				3047.27		
			<b>Rate per Km = (a+b+c+d+e)/1000</b>				33519.95		
								<b>say</b>	<b><u>33520.00</u></b>
11.8		(b)	<b>Maintenance of flowering plants and shrubs in central verge for one year</b>						
			<i>Unit = km</i>						
			<i>Taking output = one km</i>						
			<b>a) Labour</b>						
			Mate	day	36.000	300.00	10800.00		L-12
			Mazdoor	day	365.000	250.00	91250.00		L-13
			<b>b) Machinery</b>						
			Water tanker6 KL capacity	hour	90.000	488.00	43920.00		P&M-060
			<b>c) Material</b>						
			Manure Sludge / farm yard manure at site	cum	10.000	121.00	1210.00		M-167
			Cost of water	KL	180.000	60.00	10800.00		M-189
			Replacement of casualties @ 10 per cent						
			Plants	each	20.000	13.00	260.00		M-100
			Shrubs	each	80.000	11.00	880.00		M-166
			Pesticides	kg	1.500	308.00	462.00		M-136
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				15958.20		
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				17554.02		
			<b>Rate per Km for one year = (a+b+c+d+e)</b>				193094.22		
								<b>say</b>	<b><u>193094.00</u></b>

			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)						
11.9	307		<b>Planting of Trees and their Maintenance for one Year</b>						
			Planting of trees by the road side (Avenue trees) in 0.60 m dia holes, 1 m deep dug in the ground, mixing the soil with decayed farm yard/sludge manure, planting the saplings, backfilling the trench, watering, fixing the tree guard and maintaining the plants for one year						
			<b>Unit = Each</b>						
			<b>Taking output = 10 trees</b>						
			<b>a) Labour</b>						
			Mate	day	1.700	300.00	510.00		L-12
			Mazdoor for planting	day	2.000	250.00	500.00		L-13
			Mazdoor for maintenance for one year	day	15.000	250.00	3750.00		L-13
			<b>b) Machinery</b>						
			Water tanker6 KL capacity	hour	30.000	488.00	14640.00		P&M-060
			<b>c) Material</b>						
			Sapling 2 m high 25 mm dia	each	10.000	88.00	880.00		M-160
			Farm yard manure	cum	0.940	121.00	113.74		M-167
			Pesticide	kg	0.500	308.00	154.00		M-136
			Cost of water	KL	12.000	60.00	720.00		M-189
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				2126.77		
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				2339.45		
			Cost for 10 trees = a+b+c+d+e				25733.97		
			<b>Rate per trees = (a+b+c+d+e)/10</b>				2573.40		
							<b>say</b>	<b>2573.00</b>	
11.10	308		<b>Renovation Lawns including, Weeding, Forking the Ground, Top Dressing with Forked Soil</b>						
			Renovation lawns including, weeding, forking the ground, top dressing with forked soil, watering and maintenance the lawns, for 30 days or more, till the grass forms a thick lawn, free from weeds, and fit for moving and disposal of rubbish as directed, including supplying good earth, if needed but excluding the cost of well decayed farm yard manure						
			<b>Unit = sqm</b>						
			<b>Taking output = 100 sqm</b>						
			<b>a) Labour</b>						
			Mate	day	0.120	300.00	36.00		L-12
			Mazdoor	day	3.000	250.00	750.00		L-13
			<b>b) Machinery</b>						
			Water tanker6 KL capacity	hour	0.500	488.00	244.00		P&M-060
			<b>c) Material</b>						
			Cost of water	KL	3.000	60.00	180.00		M-189
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				121.00		
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				133.10		
			Cost for 100 sqm = a+b+c+d+e				1464.10		
			<b>Rate per sqm = (a+b+c+d+e)</b>				14.64		
							<b>say</b>	<b>15.00</b>	
11.11	308.2		<b>Supply at Site Well Decayed Farm Yard Manure</b>						
			Supply at site of work well decayed farm yard manure, from any available source, approved by the engineer in charge including screening and stacking						

			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)					
			<b>Unit = cum</b>					
			<b>Taking output = one cum</b>					
			<b>a) Material</b>					
			a) Cost of well decayed farm yard manure duly screened, loading, carriage, unloading and stacking at site	cum	1.000	121.00	121.00	M-167
			b) Overhead charges @ 10 % on (a)				12.10	
			c) Contractor's profit @ 10 % on (a+b)				13.31	
			Rate per cum = (a+b+c)				146.41	
							<b>146.00</b>	
11.14		New	Half Brick Circular Tree Guard, in 2nd Class Brick, internal diametre 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground					
			Half brick circular tree guard, in 2nd class brick, internal diametre 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground, bottom two courses laid dry, and top three courses in cement mortar 1:6 (1 cement 6 sand) and the intermediate courses being in dry honey comb masonry, as per design complete					
			<b>Unit = Each</b>					
			<b>Taking output = one tree guard</b>					
			<b>a) Labour</b>					
			Mate	day	0.050	300.00	15.00	L-12
			Mason	day	0.250	400.00	100.00	L-11
			Mazdoor	day	0.250	250.00	62.50	L-13
			<b>b) Material</b>					
			Brick 2nd class including carriage	each	230.000	9.00	2070.00	M-079
			Cement mortar 1:6	cum	0.025	3224.00	80.60	Item 12.6 (D)
			c) Overhead charges @ 10 % on (a+b)				232.81	
			d) Contractor's profit @ 10 % on (a+b+c)				256.09	
			Rate per tree Guard = a+b+c+d				2817.00	
							<b>say</b>	<b>2817.00</b>
11.15		New	Edging with 2nd Class Bricks, Laid Dry Lengthwise					
			Edging with 2nd class bricks, laid dry lengthwise, including excavation, refilling, consolidation, with a hand packing and spreading nearly surplus earth within a lead of 50 metres					
			<b>Unit = Metre</b>					
			<b>Taking output = 10 metres</b>					
			<b>a) Labour</b>					
			Mate	day	0.002	300.00	0.60	L-12
			Mason	day	0.050	400.00	20.00	L-11
			Mazdoor	day	0.050	250.00	12.50	L-13
			<b>b) Material</b>					
			Brick 2nd class including carriage	each	50.000	9.00	450.00	M-079
			c) Overhead charges @ 10 % on (a+b)				48.31	
			d) Contractor's profit @ 10 % on (a+b+c)				53.14	
			Cost for 10 metre = a+b+c+d				584.55	
			Rate per metre = (a+b+c+d)/10				58.46	
							<b>say</b>	<b>58.00</b>

			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)						
11.16		New	<b>Making Tree Guard 53 cm dia and 1.3 m High as per Design from Empty Bitumen Drums</b>						
			Making tree guard 53 cm dia and 1.3 m high as per design from empty bitumen drum, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets, complete in all respect						
			<b>Unit = Each</b>						
			<b>Taking output = one tree guard</b>						
			<b>a) Labour</b>						
			Mate	day	0.020	300.00	6.00		L-12
			Blacksmith	day	0.150	400.00	60.00		L-02
			Mazdoor	day	0.070	250.00	17.50		L-13
			<b>b) Material</b>						
			Empty bitumen drum	each	1.000	60.00	60.00		M-172
			MS sheet 50 x 0.5 mm	kg	0.650	57.21	37.19		M-179 /1000
			Rivets 6 mm dia and 10 mm in length	each	22.000	0.90	19.80		M-158
			<b>d) Overhead charges @ 10 % on (a+b+c)</b>				20.05		
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				22.05		
			<b>Rate for each tree guard = a+b+c+d</b>				242.59		
							<b>say</b>	<b>243.00</b>	
11.17		New	<b>Making Tree Guard 53 cm dia and 2 Metre High as per Design from Empty Bitumen Drums</b>						
			Making tree guard 53 cm dia and 2 metres high as per design from empty bitumen drums, slit suitably to permit sun and air, ( supplied by the department at stock issue rate) including providing and fixing four legs 40 cm long of 30 x 3 mm MS riveted to tree guard and providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets complete in all respects						
			<b>Unit = Each</b>						
			<b>Taking output = one tree guard</b>						
			<b>a) Labour</b>						
			Mate		0.040	300.00	12.00		L-12
			Blacksmith	day	0.200	400.00	80.00		L-02
			Mazdoor		0.200	250.00	50.00		L-13
			<b>b) Material</b>						
			Empty bitumen drum	each	1.500	60.00	90.00		M-172
			MS sheet 50 x 0.5 mm	kg	0.650	57.21	37.19		M-179 /1000
			Rivets 6 mm dia and 10 mm in length	each	50.000	0.90	45.00		M-158
			MS plate 30 x 3 mm	kg	1.300	57.21	74.37		M-179 /1000
			<b>c) Overhead charges @ 10 % on (a+b)</b>				38.86		
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				42.74		
			<b>Rate for each tree guard = a+b+c+d</b>				470.16		
							<b>say</b>	<b>470.00</b>	
11.18		New	<b>Wrought Iron and Mild Steel Welded Work</b>						
			Wrought iron and mild steel welded work (using angles, square bars, tees and channel grills, grating frames, gates and tree guards of any size and design etc. including cost of screens and welding rods or bolts and nuts complete fixed in position but without the cost of excavation and concrete for fixing which will be paid separately)						

			Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)						
			<b>Unit = quintal</b>						
			<b>Taking output = one quintal</b>						
			<b>a) Labour</b>						
			Mate	day	0.450	300.00	135.00		L-12
			Blacksmith/ welder for cutting to design and shape and jointing	day	2.000	400.00	800.00		L-02
			Mazdoor for fixing and helper for Blacksmith/welder	day	2.500	250.00	625.00		L-13
			<b>b) Material</b>						
			Angle, tees, channels etc	quintal	1.050	5721.00	6007.05		M-179 /10
			Deduct the cost of scrap	quintal	0.050	(1907.00)	(95.35)		M-179/10/3
			Add 5 per cent of cost of material for welding rods and other welding accessories				295.59		
			<b>c) Overhead charges @ 10 % on (a+b)</b>				776.73		
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				854.40		
			<b>Rate per quintal = a+b+c+d</b>				9398.41		
							<b>say</b>	<b>9398.00</b>	
11.19	New		<b>Tree Guard with MS Iron</b>						
			Providing and fixing MS iron tree guard 60 cm dia and 2 metre high above ground level formed of 4 Nos (25 x 6 mm) and 8 Nos (25 x 3 mm) vertical MS riveted to 3 Nos (25 x 6 mm) iron rings in two halves, bolted together with 8 mm dia and 30 mm long bolts including painting two coats with paint of approved brand over a coat of priming, complete in all respects.						
			<b>Unit = Each</b>						
			<b>Taking output = one tree guard</b>						
			<b>a) Labour</b>						
			Mate	day	0.050	300.00	15.00		L-12
			Blacksmith	day	0.250	400.00	100.00		L-02
			Mazdoor	day	0.250	250.00	62.50		L-13
			<b>b) Material</b>						
			MS iron 25 x 6 mm	kg	19.200	57.21	1098.43		M-179 /1000
			MS iron 25 x 3 mm	kg	9.600	57.21	549.22		M-179 /1000
			Add 5 per cent of cost of material for riveting, bolting and welding accessories						
			<b>c) Machinery</b>						
			Tractor-trolley	hour	0.040	427.00	17.08		P&M-053
			<b>d) Painting</b>						
			Painting two coats including priming	sqm	1.770	61.00	107.97		Item 8.9
			<b>e) Overhead charges @ 10 % on (a+b+c)</b>				184.22		
			<b>f) Contractor's profit @ 10 % on (a+b+c+e)</b>				202.65		
			<b>Rate per tree guard =a+b+c+d+e+f</b>				2337.07		
							<b>say</b>	<b>2337.00</b>	
		<b>Note</b>	1 The items of excavation and concreting to be measured and paid separately as per design . 2 . Rate of painting may be adopted from the chapter as Traffic signs.						
11.20	New		<b>Tree Guard with MS Angle Iron and Steel Wire</b>						
			Providing and fixing tree guard 0.60 metre square, 2.00 metre high fabricated with MS angle iron 30 x 30 x 3 mm, MS iron 25 x 3 mm and steel wire 3 mm dia welded and fabricated as per design in two halves bolted together						

		Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)						
		<b>Unit = Each</b>						
		<b>Taking output = one</b>						
		<b>a) Labour</b>						
		Mate	day	0.050	300.00	15.00		L-12
		Blacksmith	day	0.250	400.00	100.00		L-02
		Welder	day	0.250	400.00	100.00		L-02
		Mazdoor	day	0.250	250.00	62.50		L-13
		<b>b) Material</b>						
		MS angle 30 x 30 x 3 mm	kg	13.500	57.21	772.34		M-179 /1000
		MS iron 25 x 3 mm	kg	18.000	57.21	1029.78		M-179 /1000
		Steel wire 3 mm dia	kg	6.000	145.00	870.00		M-192
		Add 5 per cent of cost of material for riveting, bolting and welding accessories				133.61		
		<b>c) Machinery</b>						
		Tractor-trolley	hour	0.040	427.00	17.08		P&M-053
		<b>d) Painting</b>						
		Painting two coats including priming	sqm	1.500	61.00	91.50		Item 8.9
		<b>e) Overhead charges @ 10 % on (a+b+c)</b>				310.03		
		<b>f) Contractor's profit @ 10 % on (a+b+c+e)</b>				341.03		
		<b>Rate per tree guard = a+b+c+d+e+f</b>				3842.86		
							<b>say</b>	<b>3843.00</b>
11.21	New	<b>Compensatory Afforestation</b>						
		Planting trees as compensatory afforestation at the rate of 290 trees per hectare at a spacing of 6 m by grubbing and leveling the ground upto a depth of 150 mm, digging holes 0.9 m dia, 1 m deep, mixing farm yard/sludge manure with soil, planting of sapling 2 m high with 25 cm dia stem, backfilling the hole and watering						
		<b>Unit = Hectare</b>						
		<b>Taking output = one hectare</b>						
		<b>a) Labour</b>						
		<b>i) Planting</b>						
		Mate	day	2.500	300.00	750.00		L-12
		Mazdoor	day	25.000	250.00	6250.00		L-13
		<b>ii) For Maintenance for one year</b>						
		Mate	day	5.000	300.00	1500.00		L-12
		Mazdoor	day	50.000	250.00	12500.00		L-13
		<b>b) Machinery</b>						
		Dozer D 50 @ 1000 sqm/hour	hour	10.000	2632.00	26320.00		P&M-015
		Water tanker 6 KL capacity (for planting)	hour	3.000	488.00	1464.00		P&M-060
		Water tanker 6 KL capacity (for maintenance)	hour	25.000	488.00	12200.00		P&M-060
		<b>c) Material</b>						
		Sapling 1 to 1.5 m high 2 cm dia stem	each	290.000	70.40	20416.00		M-160 x 0.8
		Add 10 per cent of sapling	each	29.000	70.40	2041.60		M-160 x 0.8
		Decayed farm yard/sludge manure (planting)	cum	60.900	121.00	7368.90		M-167
		Decayed farm yard/sludge manure (maintenance)	cum	4.000	121.00	484.00		M-167
		Pesticides for planting	kg	0.500	308.00	154.00		M-136
		Pesticides for maintenance	kg	1.500	308.00	462.00		M-136
		Cost of water	KL	18.000	60.00	1080.00		M-189
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				9299.05		
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				10228.96		
		<b>Rate per hectare = a+b+c+d+e</b>				112518.51		
							<b>say</b>	<b>112519.00</b>
	<b>Note</b>	Cost of fencing to be provided as per size of plot and approved design, measured and paid separately						

## Chapter – 12

### FOUNDATION

#### Preamble:

- 1 Excavation for structures has been provided both by manual and mechanical means.
- 2 The earth excavated from foundation has been proposed to be backfilled and balance quantity utilised for road works locally except for marshy soil where disposal has been provided.
- 3 In case of rocks, excavation has been considered upto a depth of 3 m only.
- 4 Embedment of foundation in soft and hard rocks has been provided as required by the specifications.
- 5 Dewatering has been provided in excavation for foundation on percentage basis. In case less dewatering is required or is not required at all for a particular site condition, the same may be reduced/omitted.
- 6 Mixing of cement concrete has been considered by using concrete mixer and batching plant. The rate can be adopted depending upon availability of equipment and as approved by the Engineer.
- 7 Concrete batching plant is considered to be placed within 10 (ten) km of the bridge site.
- 8 The coarse and fine aggregate for cement concrete shall be as per IS:383.
- 9 Description of items has been given very briefly. Relevant Clause of MoRT&H Specifications have to be referred for detailed specification.
- 10 The rate for well foundation has been included for diameter varying from 6 m to 12 m. Well for twin D type has also been included.
- 11 Pneumatic sinking is a specialised job. All safety precautions as per IS:4138 are required to be taken. Medical supervision for such works is considered very essential. Depth of Pneumatic sinking has been restricted to 30 m below normal water level.
- 12 Rates for various type of piles like bored cast-in-situ, driven precast RCC pile and driven steel piles of H section have been included. If the steel casting in case of driven pile is required to be retained the same is required to be priced separately.
- 13 Pile driving rigs including vibratory hammers are considered to be self contained with power units and necessary accessories required for driving.
- 14 The quantity of concrete which is required to be stripped off upto a minimum height of 600 mm above the designed top level of the pile has been taken into account in the rate.
- 15 The levelling course below the pile cap is proposed with M 15 grade concrete.
- 16 Rates for Steel reinforcement for cement concrete works are provided separately.
- 17 Appendix-4 of IRC:78-2000 has to be referred regarding precautions to be taken during sinking of wells.

- 18 In case of blasting during sinking of wells the inner face of the curb is required to be protected with the steel plates of thickness not less than 10 mm upto top level of well curb. For height above top of curb, the thickness of steel plate may be reduced to 6 mm. This extra height of steel lining should be limited to 3 m.
- 19 The concrete mix used in bottom plug shall have a minimum cement content of 330 kg/cum and a slump of about 150 mm to permit easy flow of concrete through tremie to fill-up all cavities.
- 20 Necessary safety precautions shall be taken for excavation on open foundations for which guidance may be taken from IS:3764.
- 21 A levelling course of 100 mm thickness in M 10 (1:3:6) shall be provided before laying open foundations.
- 22 In the case of open foundation, dewatering shall not be permitted from the time of placing of concrete upto 24 hours after placement.
- 23 In case of open foundations in rock, the trenches around the footing shall be filled-up with concrete of M 15 grade upto a level of 0.6 m for hard rock and 1.5 m for soft rock above the foundation level. The portion above this shall be filled by boulders grouted with cement.
- 24 When there are two or more compartments in a well, the lower edge of the cutting edge of the middle stems of such wells shall be kept about 300 mm above that of outer stems to prevent rocking.
- 25 The well curb shall be in RCC of mix not leaner than M 25 grade with minimum steel reinforcement of 72 kg/cum excluding bond rods.
- 26 The top of bottom plug shall be atleast 300 mm above top of curb.
- 27 No dewatering shall be carried out within 7 days of casting of bottom plug.
- 28 In case of cement concrete piles, the minimum grade of concrete shall be M 35 with minimum cement content of 400 kg/cum.
- 29 The top of the pile shall project 50 mm into the pile cap and reinforcement of pile shall be fully anchored in pile cap.
- 30 The minimum thickness of pile cap should be atleast 0.6 m or 1.5 times the diameter of the pile whichever is more.
- 31 Guidance for piles is to be obtained from IS:2911.
- 32 Concrete in driven cast-in-situ piles shall be cast upto a minimum height of 600 mm above the designed top level of pile, which shall be stripped off to obtain sound concrete either before final set or after 3 days.
- 33 In remote areas, for isolated slab culvert/box culvert upto 2 m span, concrete can be hand mixed in accordance with Clause 806 of MORD Specifications. Therefore, in the analysis, for items of concrete, the alternative of hand mixing has also been considered.

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 (without de-watering)					
		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	300.00	42.00	L-12
			Mazdoor	day	3.50	250.00	875.00	L-13
			b) <b>Overhead charges @ 20 % on (a)</b>				183.40	
			c) <b>Contractor's profit @ 10 % on (a+b)</b>				110.04	
			Cost for 10 cum = a+b+c				1210.44	
			<b>Rate per cum = (a+b+c)/10</b>				121.04	
							<i>say</i>	<b>121.00</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 (with de-watering)					
		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	0.154	300.00	46.20	L-12
			Mazdoor	day	3.85	250.00	962.50	L-13
			b) <b>Overhead charges @ 20 % on (a)</b>				201.74	
			c) <b>Contractor's profit @ 10 % on (a+b)</b>				121.04	
			Cost for 10 cum = a+b+c				1331.48	
			<b>Rate per cum = (a+b+c)/10</b>				133.15	
							<i>say</i>	<b>133.00</b>
12.1 (I) A		(ii)	<b>Depth 3 m to 6 m (without de-watering)</b>					
			a) <b>Labour</b>					
			Mate/Supervisor	day	0.18	300.00	54.00	L-12
			Mazdoor	day	4.50	250.00	1125.00	L-13
			b) <b>Overhead charges @ 20 % on (a)</b>				235.80	
			c) <b>Contractor's profit @ 10 % on (a+b)</b>				141.48	
			Cost for 10 cum = a+b+c				1556.28	
			<b>Rate per cum = (a+b+c)/10</b>				155.63	
							<i>say</i>	<b>156.00</b>
			<b>Depth 3 m to 6 m (with de-watering)</b>					
			a) <b>Labour</b>					
			Mate/Supervisor	day	0.207	300.00	62.10	L-12
			Mazdoor	day	5.175	250.00	1293.75	L-13
			b) <b>Overhead charges @ 20 % on (a)</b>				271.17	
			c) <b>Contractor's profit @ 10 % on (a+b)</b>				162.70	
			Cost for 10 cum = a+b+c				1789.72	
			<b>Rate per cum = (a+b+c)/10</b>				178.97	
							<i>say</i>	<b>179.00</b>

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.1 (I) A		(iii)	Depth above 6 m (without de-watering)					
			a) Labour					
			Mate/Supervisor	day	0.24	300.00	72.00	L-12
			Mazdoor	day	6.00	250.00	1500.00	L-13
			b) Overhead charges @ 20 % on (a)				314.40	
			c) Contractor's profit @ 10 % on (a+b)				188.64	
			Cost for 10 cum = a+b+c				2075.04	
			Rate per cum = (a+b+c)/10				207.50	
						say	<u>208.00</u>	
			Depth above 6 m (with de-watering)					
			a) Labour					
			Mate/Supervisor	day	0.29	300.00	86.40	L-12
			Mazdoor	day	7.20	250.00	1800.00	L-13
			b) Overhead charges @ 20 % on (a)				377.28	
			c) Contractor's profit @ 10 % on (a+b)				226.37	
			Cost for 10 cum = a+b+c				2490.05	
			Rate per cum = (a+b+c)/10				249.00	
						say	<u>249.00</u>	
12.1 (I)		B	Mechanical Means					
		(i)	Depth upto 3 m (without de-watering)					
			Unit = cum					
			Taking output = 240 cum					
			a) Labour					
			Mate	day	0.32	300.00	96.00	L-12
			Mazdoor	day	8.00	250.00	2000.00	L-13
			b) Machinery					
			Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1571.00	9426.00	P&M-026
			c) Overhead charges @ 20 % on (a+b)				2304.40	
			d) Contractor's profit @ 10 % on (a+b+c)				1382.64	
			Cost for 240 cum = a+b+c+d				15209.04	
			Rate per cum = (a+b+c+d)/240				63.37	
						say	<u>63.00</u>	
			Depth upto 3 m (with de-watering)					
			Unit = cum					
			Taking output = 240 cum					
			a) Labour					
			Mate	day	0.34	300.00	100.80	L-12
			Mazdoor	day	8.40	250.00	2100.00	L-13
			b) Machinery					
			Hydraulic excavator 1.0 cum bucket capacity	hour	6.30	1571.00	9897.30	P&M-026
			c) Overhead charges @ 20 % on (a+b)				2419.62	
			d) Contractor's profit @ 10 % on (a+b+c)				1451.77	
			Cost for 240 cum = a+b+c+d				15969.49	
			Rate per cum = (a+b+c+d)/240				66.54	
						say	<u>67.00</u>	
12.1 (I) B		(ii)	Depth 3 m to 6 m (without de-watering)					
			Unit = cum					
			Taking output = 210 cum					
			a) Labour					
			Mate	day	0.32	300.00	96.00	L-12
			Mazdoor	day	8.00	250.00	2000.00	L-13
			b) Machinery					
			Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1571.00	9426.00	P&M-026
			c) Overhead charges @ 20 % on (a+b)				2304.40	
			d) Contractor's profit @ 10 % on (a+b+c)				1382.64	
			Cost for 210 cum = a+b+c+d				15209.04	
			Rate per cum = (a+b+c+d)/210				72.42	
						say	<u>72.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Depth 3 m to 6 m (with de-watering)					
		<i>Unit = cum</i>					
		<i>Taking output = 210 cum</i>					
		a) Labour					
		Mate	day	0.34	300.00	103.20	L-12
		Mazdoor	day	8.60	250.00	2150.00	L-13
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.45	1571.00	10132.95	P&M-026
		c) Overhead charges @ 20 % on (a+b)				2477.23	
		d) Contractor's profit @ 10 % on (a+b+c)				1486.34	
		Cost for 210 cum = a+b+c+d				16349.72	
		Rate per cum = (a+b+c+d)/210				77.86	
					say	<u>78.00</u>	
12.1 (I) B	(iii)	Depth above 6m (without de-watering)					
		<i>Unit = cum</i>					
		<i>Taking output = 180 cum</i>					
		a) Labour					
		Mate	day	0.40	300.00	120.00	L-12
		Mazdoor	day	10.00	250.00	2500.00	L-13
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1571.00	9426.00	P&M-026
		c) Overhead charges @ 20 % on (a+b)				2409.20	
		d) Contractor's profit @ 10 % on (a+b+c)				1445.52	
		Cost for 180 cum = a+b+c+d				15900.72	
		Rate per cum = (a+b+c+d)/180				88.34	
					say	<u>88.00</u>	
		Depth above 6m (with de-watering)					
		<i>Unit = cum</i>					
		<i>Taking output = 180 cum</i>					
		a) Labour					
		Mate	day	0.44	300.00	132.00	L-12
		Mazdoor	day	11.00	250.00	2750.00	L-13
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.60	1571.00	10368.60	P&M-026
		c) Overhead charges @ 20 % on (a+b)				2650.12	
		d) Contractor's profit @ 10 % on (a+b+c)				1590.07	
		Cost for 180 cum = a+b+c+d				17490.79	
		Rate per cum = (a+b+c+d)/180				97.17	
					say	<u>97.00</u>	
12.1	II	Ordinary Rock (not requiring blasting)					
	A	Manual Means					
	(i)	Depth upto 3 m (without de-watering)					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
		a) Labour					
		Mate	day	0.20	300.00	60.00	L-12
		Mazdoor	day	5.00	250.00	1250.00	L-13
		b) Overhead charges @ 20 % on (a)				262.00	
		c) Contractor's profit @ 10 % on (a+b)				157.20	
		Cost for 10 cum = a+b+c				1729.20	
		Rate per cum = (a+b+c)/10				172.92	
					say	<u>173.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Depth upto 3 m (with de-watering)					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
		a) Labour					
		Mate	day	0.22	300.00	66.00	L-12
		Mazdoor	day	5.50	250.00	1375.00	L-13
		b) Overhead charges @ 20 % on (a)				288.20	
		c) Contractor's profit @ 10 % on (a+b)				172.92	
		Cost for 10 cum = a+b+c				1902.12	
		Rate per cum = (a+b+c)/10				190.21	
						<b>say</b>	<b><u>190.00</u></b>
12.1(II)	B	Mechanical Means					
		Depth upto 3 m (without de-watering)					
		<i>Unit = cum</i>					
		<i>Taking output = 180 cum</i>					
		a) Labour					
		Mate	day	0.24	300.00	72.00	L-12
		Mazdoor	day	6.00	250.00	1500.00	L-13
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1571.00	9426.00	P&M-026
		c) Overhead charges @ 20 % on (a+b)				2199.60	
		d) Contractor's profit @ 10 % on (a+b+c)				1319.76	
		Cost for 180 cum = a+b+c+d				14517.36	
		Rate per cum = (a+b+c+d)/180				80.65	
						<b>say</b>	<b><u>81.00</u></b>
		Depth upto 3 m (without de-watering)					
		<i>Unit = cum</i>					
		<i>Taking output = 180 cum</i>					
		a) Labour					
		Mate	day	0.26	300.00	79.20	L-12
		Mazdoor	day	6.60	250.00	1650.00	L-13
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.60	1571.00	10368.60	P&M-026
		c) Overhead charges @ 20 % on (a+b)				2419.56	
		d) Contractor's profit @ 10 % on (a+b+c)				1451.74	
		Cost for 180 cum = a+b+c+d				15969.10	
		Rate per cum = (a+b+c+d)/180				88.72	
						<b>say</b>	<b><u>89.00</u></b>
12.1	III	Hard Rock ( requiring blasting )					
	A	Manual Means					
		Without de-watering					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
		a) Labour					
		Mate	day	0.35	300.00	105.00	L-12
		Driller	day	0.50	300.00	150.00	L-06
		Blaster	day	0.25	300.00	75.00	L-03
		Mazdoor	day	8.00	250.00	2000.00	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Air Compressor 250 cfm with 2 jack hammer for drilling.	hour	1.00	516.00	516.00	P&M-001
		<b>c) Material</b>					
		Blasting Material	kg	3.50	148.00	518.00	M-104
		Detonator electric	each	14.00	9.90	138.60	M-094/100
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				700.52	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				420.31	
		Cost for 10 cum = a+b+c+d+e				4623.43	
		<b>Rate per cum = (a+b+c+d+e)/10</b>				462.34	
					<b>say</b>	<b>462.00</b>	
		<b>Without de-watering</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 10 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.39	300.00	115.50	L-12
		Driller	day	0.55	300.00	165.00	L-06
		Blaster	day	0.28	300.00	82.50	L-03
		Mazdoor	day	8.80	250.00	2200.00	L-13
		<b>b) Machinery</b>					
		Air Compressor 250 cfm with 2 jack hammer for drilling.	hour	1.10	516.00	567.60	P&M-001
		<b>c) Material</b>					
		Blasting Material	kg	3.50	148.00	518.00	M-104
		Detonator electric	each	14.00	9.90	138.60	M-094/100
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				757.44	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				454.46	
		Cost for 10 cum = a+b+c+d+e				4999.10	
		<b>Rate per cum = (a+b+c+d+e)/10</b>				499.91	
					<b>say</b>	<b>500.00</b>	
12.1	IV	<b>Hard Rock ( blasting prohibited )</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 10 cum</b>					
	A	<b>Mechanical Means (without de-watering)</b>					
		<b>a) Labour</b>					
		Mate	day	0.20	300.00	60.00	L-12
		Mazdoor	day	5.00	250.00	1250.00	L-13
		<b>b) Machinery</b>					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker	hour	6.00	516.00	3096.00	P&M-001
		<b>c) Overhead charges @ 20 % on (a+b)</b>				881.20	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				528.72	
		Cost for 10 cum = a+b+c+d				5815.92	
		<b>Rate per cum = (a+b+c+d)/10</b>				581.59	
					<b>say</b>	<b>582.00</b>	
		<b>Mechanical Means (with de-watering)</b>					
		<b>a) Labour</b>					
		Mate	day	0.22	300.00	66.00	L-12
		Mazdoor	day	5.50	250.00	1375.00	L-13
		<b>b) Machinery</b>					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker	hour	6.60	516.00	3405.60	P&M-001
		<b>c) Overhead charges @ 20 % on (a+b)</b>				969.32	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				581.59	
		Cost for 10 cum = a+b+c+d				6397.51	
		<b>Rate per cum = (a+b+c+d)/10</b>				639.75	
					<b>say</b>	<b>640.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.1		V	Marshy Soil					
			<i>Unit = cum</i>					
			<i>Taking output = 10 cum</i>					
			Depth upto 3 m					
		A	Manual means (without de-watering)					
			a) Labour					
			Mate/Supervisor	day	0.40	300.00	120.00	L-12
			Mazdoor	day	10.00	250.00	2500.00	L-13
			b) Machinery					
			Tractor-trolley for removal.	hour	2.67	427.00	1140.09	P&M-053
			c) Overhead charges @ 20 % on (a+b)				752.02	
			d) Contractor's profit @ 10 % on (a+b+c)				451.21	
			Cost for 10 cum = a+b+c+d				4963.32	
			Rate per cum = ( a+b+c+d)/ 10				496.33	
						say	<u>496.00</u>	
			Manual means (with de-watering)					
			a) Labour					
			Mate/Supervisor	day	0.52	300.00	156.00	L-12
			Mazdoor	day	13.00	250.00	3250.00	L-13
			b) Machinery					
			Tractor-trolley for removal.	hour	2.67	427.00	1140.09	P&M-053
			c) Overhead charges @ 20 % on (a+b)				909.22	
			d) Contractor's profit @ 10 % on (a+b+c)				545.53	
			Cost for 10 cum = a+b+c+d				6000.84	
			Rate per cum = ( a+b+c+d)/ 10				600.08	
						say	<u>600.00</u>	
12.1 (V)		B	Mechanical Means (without de-watering)					
			a) Labour					
			Mate	day	0.08	300.00	24.00	L-12
			Mazdoor for dressing sides, bottom and backfilling	day	2.00	250.00	500.00	L-13
			b) Machinery					
			Hydraulic excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.17	1571.00	267.07	P&M-026
			Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.45	609.00	274.05	P&M-048
			c) Overhead charges @ 20 % on (a+b)				213.02	
			d) Contractor's profit @ 10 % on (a+b+c)				127.81	
			Cost for 10 cum = a+b+c+d				1405.96	
			Rate per cum = (a+b+c+d)/10				140.60	
						say	<u>141.00</u>	
			Mechanical Means (with de-watering)					
			a) Labour					
			Mate	day	0.10	300.00	28.80	L-12
			Mazdoor for dressing sides, bottom and backfilling	day	2.40	250.00	600.00	L-13
			b) Machinery					
			Hydraulic excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.20	1571.00	320.48	P&M-026
			Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.54	609.00	328.86	P&M-048
			c) Overhead charges @ 20 % on (a+b)				255.63	
			d) Contractor's profit @ 10 % on (a+b+c)				153.38	
			Cost for 10 cum = a+b+c+d				1687.15	
			Rate per cum = (a+b+c+d)/10				168.72	
						say	<u>169.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		VI	Back Filling in Marshy Foundation Pits					
			<b>Unit : Cum</b>					
			<b>Taking Output : 6 cum</b>					
			a) Labour					
			Mate	day	0.12	300.00	36.00	L-12
			Mazdoor for dressing sides, bottom and backfilling	day	3.00	250.00	750.00	L-13
			b) Machinery					
			Tractor-trolley for transportation	hour	2.00	427.00	854.00	P&M-053
			c) Overhead charges @ 20 % on (a+b)				328.00	
			d) Contractor's profit @ 10 % on (a+b+c)				196.80	
			Cost for 6 cum = a+b+c+d				2164.80	
			Rate per cum = (a+b+c+d)/6				360.80	
						say	<u>361.00</u>	
12.2	304		Filling Annular Space Around Footing in Rock					
			<b>Unit = cum</b>					
			<b>Taking out put = 1 cum</b>					
			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					
			<b>Unit = cum</b>					
			<b>Taking output = 1 cum</b>					
			a) Labour					
			Mate	day	0.01	300.00	3.00	L-12
			Mazdoor	day	0.30	250.00	75.00	L-13
			b) Material					
			Sand (assuming 20 per cent voids)	cum	1.20	540.00	648.00	M-006
			c) Overhead charges @ 20 % on (a+b)				145.20	
			d) Contractor's profit @ 10 % on (a+b+c)				87.12	
			Rate per cum = a+b+c+d				958.32	
						say	<u>958.00</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.					
			<b>Unit = cum</b>					
			<b>Taking output = 15 cum</b>					
			a) Labour					
			Mate	day	0.64	300.00	192.00	L-12
			Mason	day	1.00	400.00	400.00	L-11
			Mazdoor	day	15.00	250.00	3750.00	L-13
			b) Material					
			40 mm Aggregate	cum	13.50	1250.00	16875.00	M-055
			coarse Sand	cum	6.75	540.00	3645.00	M-005
			cement	tonne	3.45	8120.00	28014.00	M-081
			Cost of water	KL	18.00	60.00	1080.00	M-189
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			Water tanker 6 KL capacity	hour	2.00	488.00	976.00	P&M-060
			d) Overhead charges @ 20 % on (a+b+c)				11765.20	
			e) Contractor's profit @ 10 % on (a+b+c+d)				7059.12	
			Cost for 15 cum = a+b+c+d+e				77650.32	
			Rate per cum = (a+b+c+d+e)/15				5176.69	
						say	<u>5177.00</u>	
		Note	Vibrator is a part of minor T & P which is already included in overhead charges of the contractor.					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.5	1300		Brick Masonry Work in Cement Mortar 1:3 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications.					
			<i>Unit = cum</i>					
			<i>Taking output = 5 cum</i>					
			a) Material					
			Bricks 1st class	each	2500.00	9.00	22500.00	M-079
			Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	1.20	4945.00	5934.00	Item 12.6 (A)
			b) Labour					
			Mate	day	0.48	300.00	144.00	L-12
			Mason	day	4.00	400.00	1600.00	L-11
			Mazdoor	day	8.00	250.00	2000.00	L-13
			c) Overhead charges @ 20 % on (a+b)				6435.60	
			d) Contractor's profit @ 10 % on (a+b+c)				3861.36	
			Cost for 5 cum = a+b+c+d				42474.96	
			Rate per cum (a+b+c+d)/5				8494.99	
						<b>say</b>	<b>8495.00</b>	
12.6	Sub-analysis	(A)	Cement Mortar 1:3 (1 cement : 3 sand)					
			<i>Unit = 1 cum</i>					
			<i>Taking output = 1 cum</i>					
			a) Materials					
			Cement	tonne	0.51	8120.00	4141.20	M-081
			Sand	cum	1.05	540.00	567.00	M-005
			b) Labour					
			Mate	day	0.04	300.00	12.00	L-12
			Mazdoor	day	0.90	250.00	225.00	L-13
			Total Material and Labour = (a+b)			<b>say</b>	<b>4945.00</b>	
	Sub-analysis (Addl.)	(B)	Cement Mortar 1:2 (1 cement : 2 sand)					
			<i>Unit = 1 cum</i>					
			<i>Taking output = 1 cum</i>					
			a) Materials					
			Cement	tonne	0.67	8120.00	5456.64	M-081
			Sand	cum	0.93	540.00	502.20	M-005
			b) Labour					
			Mate	day	0.04	300.00	12.00	L-12
			Mazdoor	day	0.90	250.00	225.00	L-13
			Total Material and Labour = (a+b)			<b>say</b>	<b>6196.00</b>	
	Sub-analysis (Addl.)	(C)	Cement Mortar 1:4 (1 cement : 4 sand)					
			<i>Unit = 1 cum</i>					
			<i>Taking output = 1 cum</i>					
			a) Materials					
			Cement	tonne	0.40	8120.00	3273.98	M-081
			Sand	cum	1.12	540.00	604.80	M-005
			b) Labour					
			Mate	day	0.04	300.00	12.00	L-12
			Mazdoor	day	0.90	250.00	225.00	L-13
			Total Material and Labour = (a+b)			<b>say</b>	<b>4116.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	Sub-analysis (Addl.)	(D)	Cement Mortar 1:6 (1cement :6 sand)					
			<i>Unit = 1 cum</i>					
			<i>Taking output = 1 cum</i>					
			a) Materials					
			Cement	tonne	0.29	8120.00	2338.56	M-081
			Sand	cum	1.34	540.00	722.06	M-005
			b) Labour					
			Mate	day	0.04	300.00	12.00	L-12
			Mazdoor	day	0.90	250.00	225.00	L-13
			Total Material and Labour = (a+b)			<i>say</i>	<b>3298.00</b>	
12.7	1400		Stone Masonry Work in Cement Mortar 1:3 in Foundation complete as per Drawing and Technical Specifications.					
			<i>Unit = cum</i>					
			<i>Taking output = 5 cum</i>					
	1405.4	(A)	Square Rubble Coursed Rubble Masonry (first sort)					
			a) Material					
			Stone	cum	5.50	517.00	2843.50	M-169
			Through and bond stone	each	35.00	13.00	455.00	M-182
			(35nos.x0.24mx0.24mx0.39m = 0.79 cu.m)					
			Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	1.50	4945.00	7417.50	Item 12.6 (A)
			b) Labour					
			Mate	day	0.66	300.00	198.00	L-12
			Mason	day	7.50	400.00	3000.00	L-11
			Mazdoor	day	9.00	250.00	2250.00	L-13
			c) Overhead charges @ 20 % on (a+b)				3232.80	
			d) Contractor's profit @ 10 % on (a+b+c)				1939.68	
			Cost for 5 cum = a+b+c+d				21336.48	
			Rate per cum (a+b+c+d)/5				4267.30	
						<i>say</i>	<b>4267.00</b>	
	1405.3	(B)	Random Rubble Masonry (coursed/uncoursed )					
			<i>Unit = cum</i>					
			<i>Taking output = 5 cum</i>					
			a) Material					
			Stone	cum	5.50	517.00	2843.50	M-148
			Through and bond stone	each	35.00	13.00	455.00	M-182
			(35nos.x0.24mx0.24mx0.39m = 0.79 cu.m)					
			Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	1.55	4945.00	7664.75	Item 12.6 (A)
			b) Labour					
			Mate	day	0.62	300.00	186.00	L-12
			Mason	day	6.00	400.00	2400.00	L-11
			Mazdoor	day	9.00	250.00	2250.00	L-13
			c) Overhead charges @ 20 % on (a+b)				3159.85	
			d) Contractor's profit @ 10 % on (a+b+c)				1895.91	
			Cost for 5 cum = a+b+c+d				20855.01	
			Rate per cum (a+b+c+d)/5				4171.00	
						<i>say</i>	<b>4171.00</b>	
		Note	The labour already considered in cement mortar has been taken into account while proposing labour for masonry works.					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.8	1500, 1700 & 2100		Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.					
		A (i)	PCC Grade M15					
			<b>Unit = cum</b>					
			<b>Taking output = 15 cum</b>					
		a)	<b>Material</b>					
			Cement	tonne	4.13	8120.00	33535.60	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			40 mm Aggregate	cum	8.10	1250.00	10125.00	M-055
			20 mm Aggregate	cum	4.05	1600.00	6480.00	M-053
			10 mm Aggregate	cum	1.35	1750.00	2362.50	M-051
		b)	<b>Labour</b>					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
		c)	<b>Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 63 KVA	hour	6.00	545.00	3270.00	P&M-019
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>4449.00</b>			
		d)	<b>Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery</b>				2669.12	
		e)	<b>Overhead charges @ 20 % on (a+b+c+d)</b>				13879.44	
		f)	<b>Contractor's profit @ 10 % on (a+b+c+d+e)</b>				8327.67	
			Cost for 15 cum = a+b+c+d+e+f				91604.34	
			Rate per cum = (a+b+c+d+e+f)/15				6106.96	
						<b>say</b>	<b>6107.00</b>	
		Note	Needle Vibrator is an item of minor T & P which is already included in overhead charges. Hence not added in rate analysis of cement concrete works.					
12.8		B	PCC Grade M20					
			<b>Unit : cum</b>					
			<b>Taking output = 15 cum</b>					
		a)	<b>Material</b>					
			Cement	tonne	5.16	8120.00	41899.20	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			40 mm Aggregate	cum	5.40	1250.00	6750.00	M-055
			20 mm Aggregate	cum	5.40	1600.00	8640.00	M-053
			10 mm Aggregate	cum	2.70	1750.00	4725.00	M-051
		b)	<b>Labour</b>					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
		c)	<b>Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5028.00</b>			
		d)	<b>Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery</b>				3016.45	
		e)	<b>Overhead charges @ 20 % on (a+b+c+d)</b>				15685.53	
		f)	<b>Contractor's profit @ 10 % on (a+b+c+d+e)</b>				9411.32	
			Cost for 15 cum = a+b+c+d+e+f				103524.50	
			Rate per cum = (a+b+c+d+e+f)/15				6901.63	
						<b>say</b>	<b>6902.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.8		C	RCC Grade M20					
		Case I	Using Concrete Mixer					
			<b>Unit = cum</b>					
			<b>Taking output = 15 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	5.21	8120.00	42305.20	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
			10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5208.00</b>			
			<b>d) Formwork @ 4 per cent on (a+b+c)</b>				3124.49	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				16247.34	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				9748.40	
			Cost for 15 cum = a+b+c+d+e+f				107232.43	
			Rate per cum = ( a+b+c+d+e+f)/15				7148.83	
						<b>say</b>	<b>7149.00</b>	
12.8 C		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			<b>Unit : cum</b>					
			<b>Taking Output = 120 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	41.66	8120.00	338279.20	M-081
			Coarse Sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.84	300.00	252.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
			Lead beyond 1 km, L-lead in km	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
			Concrete Pump	hour	6	279.00	1674.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>4970.00</b>			
			<b>d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery</b>				23852.61	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				124033.56	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				74420.14	
			Cost for 120 cum = a+b+c+d+e+f				818621.51	
			Rate per cum = ( a+b+c+d+e+f)/120				6821.85	
						<b>say</b>	<b>6822.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.8		D	PCC Grade M25					
		Case I	Using Concrete Mixer					
			<b>Unit = cum</b>					
			<b>Taking output = 15 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	5.99	8120.00	48638.80	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			40 mm Aggregate	cum	5.40	1250.00	6750.00	M-055
			20 mm Aggregate	cum	5.40	1600.00	8640.00	M-053
			10 mm Aggregate	cum	2.70	1750.00	4725.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5477.00</b>			
			<b>d) Formwork @ 3.75 per cent of (a+b+c)</b>				3080.66	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				17046.29	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				10227.77	
			Cost for 15 cum = a+b+c+d+e+f				112505.52	
			Rate per cum = ( a+b+c+d+e+f)/15				7500.37	
						<b>say</b>	<b>7500.00</b>	
12.8 D		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			<b>Unit : cum</b>					
			<b>Taking Output = 120 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	47.95	8120.00	389354.00	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			40 mm Aggregate	cum	43.20	1250.00	54000.00	M-055
			20 mm Aggregate	cum	43.20	1600.00	69120.00	M-053
			10 mm Aggregate	cum	21.60	1750.00	37800.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.84	300.00	252.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
			Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
			Concrete Pump	hour	6	279.00	1674.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5242.00</b>			
			<b>d) Formwork @ 3.75 per cent of cost of concrete i.e. cost of material, labour and machinery</b>				23588.63	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				130523.73	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				78314.24	
			cost of 120 cum = a+b+c+d+e+f				861456.59	
			Rate per cum = (a+b+c+d+e+f)/120				7178.80	
						<b>say</b>	<b>7179.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.8		E	RCC Grade M25					
		Case I	Using Concrete Mixer					
			<i>Unit = cum</i>					
			<i>Taking output = 15 cum</i>					
			a) Material					
			Cement	tonne	6.05	8120.00	49126.00	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
			10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
			b) Labour					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5663.00</b>			
			d) Formwork @ 3.75 per cent of a+b+c.				3184.99	
			e) Overhead charges @ 20 % on (a+b+c+d)				17623.60	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				10574.16	
			cost of 15 cum = a+b+c+d+e+f				116315.74	
			Rate per cum (a+b+c+d+e+f)/15				7754.38	
						<b>say</b>	<b>7754.00</b>	
12.8 E		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			<i>Unit: cum</i>					
			<i>Taking Output = 120 cum</i>					
			a) Material					
			Cement	tonne	48.38	8120.00	392845.60	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			b) Labour					
			Mate	day	0.84	300.00	252.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader 1 cum capacity 1 cum	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
			Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5425.00</b>			
			d) Formwork @ 3.75 per cent on cost of concrete i.e. cost of material, labour and machinery				24408.06	
			e) Overhead charges @ 20 % on (a+b+c+d)				135057.93	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				81034.76	
			cost of 120 cum = a+b+c+d+e+f				891382.35	
			Rate per cum (a+b+c+d+e+f)/120				7428.19	
						<b>say</b>	<b>7428.00</b>	

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>					
			<b>a) Material</b>					
			Cement	tonne	6.08	8120.00	49369.60	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			40 mm Aggregate	cum	5.40	1250.00	6750.00	M-055
			20 mm Aggregate	cum	5.40	1600.00	8640.00	M-053
			10 mm Aggregate	cum	2.70	1750.00	4725.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5526.00</b>			
			<b>d) Formwork @ 3.50 per cent of cost of concrete i.e. cost of material, labour and machinery</b>				2900.86	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				17156.49	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				10293.89	
			cost of 15 cum = a+b+c+d+e+f				113232.84	
			<b>Rate per cum (a+b+c+d+e+f)/15</b>				7548.86	
						<b>say</b>	<b>7549.00</b>	
12.8 F		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			<i>Unit : cum</i>					
			<i>Taking Output = 120 cum</i>					
			<b>a) Material</b>					
			Cement	tonne	48.60	8120.00	394632.00	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			40 mm Aggregate	cum	43.20	1250.00	54000.00	M-055
			20 mm Aggregate	cum	43.20	1600.00	69120.00	M-053
			10 mm Aggregate	cum	21.60	1750.00	37800.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.84	300.00	252.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
			Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5286.00</b>			
			<b>d) Formwork @ 3.50 per cent of cost of concrete i.e. cost of material, labour and machinery</b>				22200.78	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				131301.76	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				78781.05	
			cost of 120 cum = a+b+c+d+e+f				866591.59	
			<b>Rate per cum (a+b+c+d+e+f)/120</b>				7221.60	
						<b>say</b>	<b>7222.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.8		G	RCC Grade M30					
		Case I	Using Concrete Mixer					
			<i>Unit = cum</i>					
			<i>Taking output = 15 cum</i>					
			<b>a) Material</b>					
			Cement	tonne	6.10	8120.00	49532.00	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
			10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5690.00</b>			
			<b>d) Formwork @ 3.5 per cent on cost of concrete i.e. cost of material, labour and machinery</b>				2986.87	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				17665.17	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				10599.10	
			cost of 15 cum = a+b+c+d+e+f				116590.14	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				7772.68	
						<b>say</b>	<b>7773.00</b>	
12.8 G		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			<i>Unit = cum</i>					
			<i>Taking output = 120 cum</i>					
			<b>a) Material</b>					
			Cement	tonne	48.80	8120.00	396256.00	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.84	300.00	252.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
			Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5453.00</b>			
			<b>d) Formwork @ 3.5 per cent of cost of concrete i.e. cost of material, labour and machinery</b>				22900.22	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				135438.44	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				81263.07	
			cost of 120 cum = a+b+c+d+e+f				893893.73	
			<b>Rate per cum (a+b+c+d+e+f)/120</b>				7449.11	
						<b>say</b>	<b>7449.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.8		H	RCC Grade M35					
		Case I	Using Concrete Mixer					
			<i>Unit = cum</i>					
			<i>Taking output = 15 cum</i>					
			<b>a) Material</b>					
			Cement	tonne	6.33	8120.00	51399.60	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
			10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5814.00</b>			
			<b>d) Formwork @ 3 per cent on a+b+c</b>				2616.20	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				17964.56	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				10778.74	
			cost of 15 cum = a+b+c+d+e+f				118566.09	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				7904.41	
						<b>say</b>	<b>7904.00</b>	
12.8 H		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			<i>Unit ; cum</i>					
			<i>Taking Output = 120 cum</i>					
			<b>a) Material</b>					
			Cement	tonne	50.64	8120.00	411196.80	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.84	300.00	252.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
			Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5577.00</b>			
			<b>d) Formwork @ 3 per cent on cost of concrete i.e. cost of material, labour and machinery</b>				20076.98	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				137861.96	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				82717.17	
			cost of 120 cum = a+b+c+d+e+f				909888.91	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				7582.41	
						<b>say</b>	<b>7582.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<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.					
			<b>WELL FOUNDATION</b>					
12.9	1200		Providing and Constructing Temporary Island 16 m diameter for Construction of Well Foundation for 8m dia. Well.					
		<b>A</b>	Assuming depth of water 1.0 m and height of island to be 1.25 m.					
			<i>Unit = 1 No</i>					
			<i>Taking output = 1 No.</i>					
		<b>a)</b>	<b>Material</b>					
			Earth (compacted)	cum	251.20	0.00	0.00	M-092
			Sand bags	each	750.00	8.80	6600.00	M-159
		<b>b)</b>	<b>Labour</b>					
			Mate	day	0.40	300.00	120.00	L-12
			Mazdoor for filling sand bags, stitching and placing	day	15.00	250.00	3750.00	L-13
		<b>c)</b>	<b>Machinery</b>					
			Crane with grab 1 cum capacity	hour	20.00	932.00	18640.00	P&M-012
			Consumables @ 2.5 per cent of (c) above				466.00	
		<b>d)</b>	<b>Overhead charges @ 20 % on (a+b+c)</b>				5915.20	
		<b>e)</b>	<b>Contractor's profit @ 10 % on (a+b+c+d)</b>				3549.12	
			<b>Rate per No. (a+b+c+d+e)</b>				39040.32	
						<b>say</b>	<b><u>39040.00</u></b>	
		<b>Note</b>	It is assumed that earth will be available within the working space of crane with grab bucket.					
12.9		<b>B</b>	Assuming depth of water 4.0 m and height of island 4.5 m.					
			<i>Unit = 1No</i>					
			<i>Taking output = 1 No</i>					
		<b>a)</b>	<b>Material</b>					
			Earth (compacted)	cum	904.32	0.00	0.00	M-092
			Sand bags	each	6000.00	8.80	52800.00	M-159
			Wooden ballies 8" Dia and 9 m long	each	95.00	495.00	47025.00	M-194
			Wooden ballies 2" Dia for bracing	metre	190.00	38.00	7220.00	M-193
		<b>b)</b>	<b>Labour</b>					
			Mate	day	5.60	300.00	1680.00	L-12
			Mazdoor for piling 8" dia ballies for piling 8" dia ballies	day	18.00	250.00	4500.00	L-13
			Mazdoor for bracing with 2" dia ballies	day	12.00	250.00	3000.00	L-13
			Mazdoor for filling sand bags, stitching and placing	day	110.00	250.00	27500.00	L-13
		<b>c)</b>	<b>Machinery</b>					
			Crane with grab 1 cum capacity	hour	50.00	932.00	46600.00	P&M-012
			Consumables and other arrangements for piling ballies @ 2.5 per cent of (a+b+c).				4758.13	
		<b>d)</b>	<b>Overhead charges @ 20 % on (a+b+c)</b>				39016.63	
		<b>e)</b>	<b>Contractor's profit @ 10 % on (a+b+c+d)</b>				23409.98	
			<b>Rate per No. (a+b+c+d+e)</b>				257509.73	
						<b>say</b>	<b><u>257510.00</u></b>	
		<b>Note</b>	For other well diameters rate can be worked out on the basis of cross-sectional area of well. The diameter of the island shall be in the conformity with clause 1203.2 of MoRTH specifications.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.9	C	Providing and constructing one span service road to reach island location from one pier location to another pier location					
		Assuming span length 30 m, width of service road 10m and depth of water 1m					
		<b>Unit = 1 meter</b>					
		<b>Taking output = 30 metre</b>					
		a) Material					
		Earth	cum	450.00	0.00	0.00	M-092
		Sand bags	each	300.00	8.80	2640.00	M-159
		b) Labour					
		Mate	day	0.24	300.00	72.00	L-12
		Mazdoor for filling sand bags, stitching and placing	day	6.00	250.00	1500.00	L-13
		c) Machinery					
		Front end Loader 1 cum capacity	hour	27.00	1253.00	33831.00	P&M-017
		Tipper 5.5 cum capacity	hour	28.00	609.00	17052.00	P&M-048
		d) Overhead charges @ 20 % on (a+b+c)				11019.00	
		e) Contractor's profit @ 10 % on (a+b+c+d)				6611.40	
		Cost for 30 m (a+b+c+d+e)				72725.40	
		Rate per m (a+b+c+d+e)/30				2424.18	
						<b>say</b>	<b><u>2424.00</u></b>
12.10	1200 & 1900	Providing and Laying Cutting Edge of Mild Steel weighing 40 kg per metre for Well Foundation complete as per Drawing and Technical Specification.					
		<b>Unit = 1 MT</b>					
		<b>Taking output = 1 MT</b>					
		a) Material					
		Structural steel in plates, angles, etc including 5 per cent wastage	tonne	1.05	57210.00	60070.50	M-179
		Nuts & bolts	Kg	20.00	100.00	2000.00	M-130
		b) Labour					
		(for cutting, bending, making holes, joining, welding and erecting in position)					
		Mate	day	1.32	300.00	396.00	L-12
		Fitter	day	5.50	400.00	2200.00	L-08
		Blacksmith	day	5.50	400.00	2200.00	L-02
		Welder	day	5.50	400.00	2200.00	L-02
		Mazdoor	day	16.50	250.00	4125.00	L-13
		Electrodes, cutting gas and other consumables @ 10 per cent of cost of (a) above				6207.05	
		c) Overhead charges @ 20 % on (a+b)				15879.71	
		d) Contractor's profit @ 10 % on (a+b+c)				9527.83	
		Rate per MT (a+b+c+d)				104806.09	
						<b>say</b>	<b><u>104806.00</u></b>
12.11	1200, 1500 & 1700	Plain/Reinforced Cement Concrete, in Well Foundation complete as per Drawing and Technical Specification.					
		<b>Unit = 1 cum</b>					
		<b>Taking output = 1 cum</b>					
	A	Well curb					
	(i)	RCC M20 Grade					
		Same as for 12.8 (C) except for formwork which shall be @ 20 per cent of the cost of concrete instead of 4 per cent.					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Case I	<b>Using Concrete Mixer</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5208.00	
			d) formwork @ 20 per cent of the cost of concrete				1041.60	
			e) Overhead charges @ 20 % on (a+b+c+d)				1249.92	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				749.95	
			Rate perm (a+b+c+d+e+f)				8249.47	
						say	<u>8249.00</u>	
12.11 A (i)		Case II	<b>With Batching Plant, Transit Mixer and Concrete Pump</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				4970.00	
			d) formwork @ 20 per cent of the cost of concrete				994.00	
			e) Overhead charges @ 20 % on (a+b+c+d)				1192.80	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				715.68	
			Rate perm (a+b+c+d+e+f)				7872.48	
						say	<u>7872.00</u>	
12.11 A		(ii)	<b>RCC M25 Grade</b>					
			Same as for 12.8 (E) except for formwork which shall be@ 20 per cent of the cost of concrete instead of 3.75 per cent.					
		Case I	<b>Using Concrete Mixer</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5663.00	
			d) formwork @ 20 per cent of the cost of concrete				1132.60	
			e) Overhead charges @ 20 % on (a+b+c+d)				1359.12	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				815.47	
			Rate perm (a+b+c+d+e+f)				8970.19	
						say	<u>8970.00</u>	
12.11 A (ii)		Case II	<b>With Batching Plant, Transit Mixer and Concrete Pump</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5513.00	
			d) formwork @ 20 per cent of the cost of concrete				1102.60	
			e) Overhead charges @ 20 % on (a+b+c+d)				1323.12	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				793.87	
			Rate perm (a+b+c+d+e+f)				8732.59	
						say	<u>8733.00</u>	
12.11 A		(iii)	<b>RCC M35 Grade</b>					
			Same as for 12.8 (H) except for formwork which shall be@ 20 per cent of the cost of concrete instead of 3.0 per cent.					
		Case I	<b>Using Concrete Mixer</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5814.00	
			d) formwork @ 20 per cent of the cost of concrete				1162.80	
			e) Overhead charges @ 20 % on (a+b+c+d)				1395.36	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				837.22	
			Rate perm (a+b+c+d+e+f)				9209.38	
						say	<u>9209.00</u>	
12.11 A (iii)		Case II	<b>With Batching Plant, Transit Mixer and Concrete Pump</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5670.00	
			d) formwork @ 20 per cent of the cost of concrete				1134.00	
			e) Overhead charges @ 20 % on (a+b+c+d)				1360.80	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				816.48	
			Rate perm (a+b+c+d+e+f)				8981.28	
						say	<u>8981.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Note.</b> If curb concrete is carried out within steel liner, cost of formwork shall be excluded.					
12.11	B	<b>Well steining</b>					
	(I)	<b>PCC M15 Grade</b>					
		Same as for 12.8 (A) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 4 per cent.					
	<b>Case I</b>	<b>Using Concrete Mixer</b>					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				4449.00	
		d) formwork @ 10 per cent of the cost of concrete				444.90	
		e) Overhead charges @ 20 % on (a+b+c+d)				978.78	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				587.27	
		Rate perm (a+b+c+d+e+f)				6459.95	
					say	<u>6460.00</u>	
12.11 B	(ii)	<b>PCC M20 Grade</b>					
		Same as for 12.8 (B) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 4 per cent.					
	<b>Case I</b>	<b>Using Concrete Mixer</b>					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5028.00	
		d) formwork @ 10 per cent of the cost of concrete				502.80	
		e) Overhead charges @ 20 % on (a+b+c+d)				1106.16	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				663.70	
		Rate perm (a+b+c+d+e+f)				7300.66	
					say	<u>7301.00</u>	
12.11 B	(iii)	<b>RCC M20 Grade</b>					
		Same as for 12.8 (C) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 4 per cent.					
	<b>Case I</b>	<b>Using Concrete Mixer</b>					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5208.00	
		d) formwork @ 10 per cent of the cost of concrete				520.80	
		e) Overhead charges @ 20 % on (a+b+c+d)				1145.76	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				687.46	
		Rate perm (a+b+c+d+e+f)				7562.02	
					say	<u>7562.00</u>	
12.11 B	(iii)	<b>Case II With Batching Plant, Transit Mixer and Concrete Pump</b>					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				4970.00	
		d) formwork @ 10 per cent of the cost of concrete				497.00	
		e) Overhead charges @ 20 % on (a+b+c+d)				1093.40	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				656.04	
		Rate perm (a+b+c+d+e+f)				7216.44	
					say	<u>7216.00</u>	
12.11 B	(iv)	<b>PCC M25 Grade</b>					
		Same as for 12.8 (D) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 4 per cent.					
	<b>Case I</b>	<b>Using Concrete Mixer</b>					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5477.00	
		d) formwork @ 10 per cent of the cost of concrete				547.70	
		e) Overhead charges @ 20 % on (a+b+c+d)				1204.94	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				722.96	
		Rate perm (a+b+c+d+e+f)				7952.60	
					say	<u>7953.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.11 B (iv)		Case II	<b>With Batching Plant, Transit Mixer and Concrete Pump</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5242.00	
			d) formwork @ 10 per cent of the cost of concrete				524.20	
			e) Overhead charges @ 20 % on (a+b+c+d)				1153.24	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				691.94	
			Rate perm (a+b+c+d+e+f)				7611.38	
						say	<u>7611.00</u>	
12.11 B		(v)	<b>RCC M25 Grade</b>					
			Same as for 12.8 (E) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 3.5 per cent.					
		Case I	<b>Using Concrete Mixer</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5663.00	
			d) formwork @ 10 per cent of the cost of concrete				566.30	
			e) Overhead charges @ 20 % on (a+b+c+d)				1245.86	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				747.52	
			Rate perm (a+b+c+d+e+f)				8222.68	
						say	<u>8223.00</u>	
12.11 B (v)		Case II	<b>With Batching Plant, Transit Mixer and Concrete Pump</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5513.00	
			d) formwork @ 10 per cent of the cost of concrete				551.30	
			e) Overhead charges @ 20 % on (a+b+c+d)				1212.86	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				727.72	
			Rate perm (a+b+c+d+e+f)				8004.88	
						say	<u>8005.00</u>	
12.11 B		(vi)	<b>PCC M30 Grade</b>					
			Same as for 12.8 (F) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 3.5 per cent.					
		Case I	<b>Using Concrete Mixer</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5526.00	
			d) formwork @ 10 per cent of the cost of concrete				552.60	
			e) Overhead charges @ 20 % on (a+b+c+d)				1215.72	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				729.43	
			Rate perm (a+b+c+d+e+f)				8023.75	
						say	<u>8024.00</u>	
12.11 B (vi)		Case II	<b>With Batching Plant, Transit Mixer and Concrete Pump</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5286.00	
			d) formwork @ 10 per cent of the cost of concrete				528.60	
			e) Overhead charges @ 20 % on (a+b+c+d)				1162.92	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				697.75	
			Rate perm (a+b+c+d+e+f)				7675.27	
						say	<u>7675.00</u>	
12.11 B		(vii)	<b>RCC M30 Grade</b>					
			Same as for 12.8 (G) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 3.5 per cent.					
		Case I	<b>Using Concrete Mixer</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5690.00	
			d) formwork @ 10 per cent of the cost of concrete				569.00	
			e) Overhead charges @ 20 % on (a+b+c+d)				1251.80	

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)				751.08	
			Rate perm (a+b+c+d+e+f)				8261.88	
						say	<u>8262.00</u>	
12.11 B (vii)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5453.00	
			d) formwork @ 10 per cent of the cost of concrete				545.30	
			e) Overhead charges @ 20 % on (a+b+c+d)				1199.66	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				719.80	
			Rate perm (a+b+c+d+e+f)				7917.76	
						say	<u>7918.00</u>	
12.11 B		(viii)	RCC M35 Grade					
			Same as for 12.8 (H) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 3 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5814.00	
			d) formwork @ 10 per cent of the cost of concrete				581.40	
			e) Overhead charges @ 20 % on (a+b+c+d)				1279.08	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				767.45	
			Rate perm (a+b+c+d+e+f)				8441.93	
						say	<u>8442.00</u>	
12.11 B (viii)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5670.00	
			d) formwork @ 10 per cent of the cost of concrete				567.00	
			e) Overhead charges @ 20 % on (a+b+c+d)				1247.40	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				748.44	
			Rate perm (a+b+c+d+e+f)				8232.84	
						say	<u>8233.00</u>	
12.11 B		(ix)	RCC M40 Grade					
			Using Batching Plant, Transit Mixer and Concrete Pump					
			<i>Unit = cum</i>					
			<i>Taking output = 120 cum</i>					
			a) Material					
			Cement	tonne	51.60	8120.00	418992.00	M-081
			Coarse Sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			Admixture	kg	206.00	55.00	11330.00	M-180
			b) Labour					
			Mate	day	0.84	300.00	252.00	L-12
			Meson	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
			c) Machinery					
			Batching Plant	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
			Transit Mixer 4 cum capacity for lead beyond 1 km.	tonne.km	300xL	0.00	0.00	Lead= 0 , P&M-050
			Concrete Pump	hour	6.00	279.00	1674.00	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>45891.00</b>			
		d) Formwork @ 10 per cent on cost of concrete i.e. cost of material, labour and machinery				68835.80	
		e) Overhead charges @ 20 % on (a+b+c+d)				151438.76	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				90863.26	
		cost of 120 cum = a+b+c+d+e+f				999495.82	
		Rate per cum = (a+b+c+d+e+f)/120				8329.13	
					<b>say</b>	<b>8329.00</b>	
12.11 C	C	<b>Bottom Plug</b>					
		Concrete to be placed using tremie pipe					
		Note: 10% extra cement to be added where under water concreting is involved					
	(i)	<b>PCC Grade M20</b>					
	Case I	<b>Using Concrete Mixer</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	5.55	8120.00	45066.00	M-081
		Coarse sand	cum	6.75	540.00	3645.00	M-005
		40 mm Aggregate	cum	5.40	1250.00	6750.00	M-055
		20 mm Aggregate	cum	5.40	1600.00	8640.00	M-053
		10 mm Aggregate	cum	2.70	1750.00	4725.00	M-051
		Admixture	Kg	18.60	55.00	1023.00	M-180
		<b>b) Labour</b>					
		Mate	day	0.90	300.00	270.00	L-12
		Mason	day	1.50	400.00	600.00	L-11
		Mazdoor	day	20.00	250.00	5000.00	L-13
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
		Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
		Light Crane 3 tonnes capacity for handling tremie pipe	hour	6.00	389.00	2334.00	P&M-013
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5464.00</b>			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				3785.95	
		d) Overhead charges @ 20 % on (a+b+c)				17146.59	
		e) Contractor's profit @ 10 % on (a+b+c+d)				10287.95	
		cost of 15 cum = a+b+c+d+e				113167.49	
		Rate per cum = (a+b+c+d+e)/15				7544.50	
					<b>say</b>	<b>7544.00</b>	
12.11 C (i)	Case II	<b>Using Batching Plant, Transit Mixer and Crane/concrete pump</b>					
		<b>Unit ; cum</b>					
		<b>Taking Output = 120 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	44.40	8120.00	360528.00	M-081
		Coarse sand	cum	54.00	540.00	29160.00	M-004
		20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
		10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
		Admixture	Kg	148.80	55.00	8184.00	M-180
		<b>b) Labour</b>					
		Mate	day	0.88	300.00	264.00	L-12
		Mason	day	3.00	400.00	1200.00	L-11
		Mazdoor	day	18.00	250.00	4500.00	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
		Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1253.00	7518.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
		Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5223.00</b>			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				29155.80	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				131183.16	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				78709.90	
		cost of 120 cum = a+b+c+d+e				865808.86	
		<b>Rate per cum = (a+b+c+d+e)/120</b>				7215.07	
					<b>say</b>	<b><u>7215.00</u></b>	
'12.11 C	(ii)	PCC Grade M25					
	Case I	Using Concrete Mixer					
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	5.99	8120.00	48638.80	M-081
		Coarse sand	cum	6.75	540.00	3645.00	M-005
		40 mm Aggregate	cum	5.40	1250.00	6750.00	M-055
		20 mm Aggregate	cum	5.40	1600.00	8640.00	M-053
		10 mm Aggregate	cum	2.70	1750.00	4725.00	M-051
		Admixture	Kg	21.60	55.00	1188.00	M-180
		<b>b) Labour</b>					
		Mate	day	0.90	300.00	270.00	L-12
		Mason	day	1.50	400.00	600.00	L-11
		Mazdoor	day	20.00	250.00	5000.00	L-13
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
		Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	389.00	2334.00	P&M-013
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5713.00</b>			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				3972.84	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				17931.53	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				10758.92	
		cost of 15 cum = a+b+c+d+e				118348.08	
		<b>Rate per cum = (a+b+c+d+e)/15</b>				7889.87	
					<b>say</b>	<b><u>7890.00</u></b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.11 C (ii)		Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
			<i>Unit = cum</i>					
			<i>Taking output = 120 cum</i>					
		a)	<b>Material</b>					
			Cement	tonne	47.88	8120.00	388785.60	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			Admixture	Kg	172.80	55.00	9504.00	M-180
		b)	<b>Labour</b>					
			Mate	day	0.88	300.00	264.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
		c)	<b>Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
			Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5470.00</b>			
			Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				30634.68	
			<b>d) Overhead charges @ 20 % on (a+b+c)</b>				137394.46	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				82436.67	
			cost of 120 cum = a+b+c+d+e				906803.41	
			<b>Rate per cum = (a+b+c+d+e)/120</b>				7556.70	
						<b>say</b>	<b>7557.00</b>	
'12.11 C		(iii)	PCC Grade M30					
		Case I	Using Concrete Mixer					
			<i>Unit = 1 cum</i>					
			<i>Taking output = 15 cum</i>					
		a)	<b>Material</b>					
			Cement	tonne	6.08	8120.00	49369.60	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			40 mm Aggregate	cum	5.40	1250.00	6750.00	M-055
			20 mm Aggregate	cum	5.40	1600.00	8640.00	M-053
			10 mm Aggregate	cum	2.70	1750.00	4725.00	M-051
			Admixture	Kg	21.60	55.00	1188.00	M-180
		b)	<b>Labour</b>					
			Mate	day	0.90	300.00	270.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
		c)	<b>Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	389.00	2334.00	P&M-013

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>5762.00</b>			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				4009.38	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				18085.00	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				10851.00	
		cost of 15 cum = a+b+c+d+e				119360.97	
		<b>Rate per cum = (a+b+c+d+e)/15</b>				7957.40	
					<b>say</b>	<b>7957.00</b>	
12.11 C (iii)	Case II	<b>Using Batching Plant, Transit Mixer and Crane/concrete pump</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 120 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	48.64	8120.00	394956.80	M-081
		Coarse sand	cum	54.00	540.00	29160.00	M-004
		20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
		10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
		Admixture	Kg	172.80	55.00	9504.00	M-180
		<b>b) Labour</b>					
		Mate	day	0.88	300.00	264.00	L-12
		Mason	day	3.00	400.00	1200.00	L-11
		Mazdoor	day	18.00	250.00	4500.00	L-13
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
		Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1253.00	7518.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
		Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5521.00</b>			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				30943.24	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				138690.41	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				83214.24	
		cost of 120 cum = a+b+c+d+e				915356.69	
		<b>Rate per cum = (a+b+c+d+e)/120</b>				7627.97	
					<b>say</b>	<b>7628.00</b>	
12.11 C	(iv)	<b>PCC Grade M35</b>					
	Case I	<b>Using Concrete Mixer</b>					
		<b>Unit = 1 cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	6.29	8120.00	51074.80	M-081
		Coarse sand	cum	6.75	540.00	3645.00	M-005
		40 mm Aggregate	cum	5.40	1250.00	6750.00	M-055
		20 mm Aggregate	cum	5.40	1600.00	8640.00	M-053
		10 mm Aggregate	cum	2.70	1750.00	4725.00	M-051
		Admixture	Kg	21.60	55.00	1188.00	M-180

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Labour</b>					
		Mate	day	0.90	300.00	270.00	L-12
		Mason	day	1.50	400.00	600.00	L-11
		Mazdoor	day	20.00	250.00	5000.00	L-13
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
		Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	389.00	2334.00	P&M-013
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>5875.00</b>			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				4094.64	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				18443.09	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				11065.85	
		cost of 15 cum = a+b+c+d+e				121724.38	
		<b>Rate per cum = (a+b+c+d+e)/15</b>				8114.96	
					<b>say</b>	<b>8115.00</b>	
12.11 C (iv)	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		<b>Unit = cum</b>					
		<b>Taking output = 120 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	50.28	8120.00	408273.60	M-081
		Coarse sand	cum	54.00	540.00	29160.00	M-004
		20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
		10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
		Admixture	Kg	172.80	55.00	9504.00	M-180
		<b>b) Labour</b>					
		Mate	day	0.88	300.00	264.00	L-12
		Mason	day	3.00	400.00	1200.00	L-11
		Mazdoor	day	18.00	250.00	4500.00	L-13
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
		Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1253.00	7518.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
		Concrete Pump	hour	6.00	279.00	1674.00	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>5632.00</b>			
		Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe..				31609.08	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				141486.94	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				84892.16	
		cost of 120 cum = a+b+c+d+e				933813.78	
		<b>Rate per cum = (a+b+c+d+e)/120</b>				7781.78	
					<b>say</b>	<b><u>7782.00</u></b>	
<b>12.11</b>	<b>D</b>	<b>Intermediate plug</b>					
	<b>(i)</b>	<b>Grade M20 PCC</b>					
		Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
	<b>Case I</b>	<b>Using Concrete Mixer</b>					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5464.00	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				1092.80	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				655.68	
		<b>Rate per cum = (a+b+c+d+e)</b>				7212.48	
					<b>say</b>	<b><u>7212.00</u></b>	
<b>12.11 D</b>	<b>(i)</b>	<b>Case II Using Batching Plant, Transit Mixer and Crane/concrete pump</b>					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5223.00	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				1044.60	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				626.76	
		<b>Rate per cum = (a+b+c+d+e)</b>				6894.36	
					<b>say</b>	<b><u>6894.00</u></b>	
<b>12.11 D</b>	<b>(ii)</b>	<b>Grade M25 PCC</b>					
		Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
	<b>Case I</b>	<b>Using Concrete Mixer</b>					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5713.00	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				1142.60	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				685.56	
		<b>Rate per cum = (a+b+c+d+e)</b>				7541.16	
					<b>say</b>	<b><u>7541.00</u></b>	
<b>12.11 D</b>	<b>(ii)</b>	<b>Case II Using Batching Plant, Transit Mixer and Crane/concrete pump</b>					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5470.00	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				1094.00	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				656.40	
		<b>Rate per cum = (a+b+c+d+e)</b>				7220.40	
					<b>say</b>	<b><u>7220.00</u></b>	
<b>12.11 D</b>	<b>(iii)</b>	<b>Grade M30 PCC</b>					
		Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
	<b>Case I</b>	<b>Using Concrete Mixer</b>					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5762.00	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				1152.40	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				691.44	
		<b>Rate per cum = (a+b+c+d+e)</b>				7605.84	
					<b>say</b>	<b><u>7606.00</u></b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.11 D (iii)		Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5521.00	
			d) Overhead charges @ 20 % on (a+b+c)				1104.20	
			e) Contractor's profit @ 10 % on (a+b+c+d)				662.52	
			Rate per cum = (a+b+c+d+e)				7287.72	
						say	<u>7288.00</u>	
12.11		E	Top plug					
		(i)	Grade M15 PCC					
			Same as Item 12.8(a) excluding formwork					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				4449.00	
			d) Overhead charges @ 20 % on (a+b+c)				889.80	
			e) Contractor's profit @ 10 % on (a+b+c+d)				533.88	
			Rate per cum = (a+b+c+d+e)				5872.68	
						say	<u>5873.00</u>	
12.11 E		(ii)	Grade M20 PCC					
			Same as Item 12.8(b) excluding formwork					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5028.00	
			d) Overhead charges @ 20 % on (a+b+c)				1005.60	
			e) Contractor's profit @ 10 % on (a+b+c+d)				603.36	
			Rate per cum = (a+b+c+d+e)				6636.96	
						say	<u>6637.00</u>	
12.11 E		(iii)	Grade M25 PCC					
			Same as Item 12.8 (d) excluding formwork					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5477.00	
			d) Overhead charges @ 20 % on (a+b+c)				1095.40	
			e) Contractor's profit @ 10 % on (a+b+c+d)				657.24	
			Rate per cum = (a+b+c+d+e)				7229.64	
						say	<u>7230.00</u>	
12.11 E (iii)		Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5242.00	
			d) Overhead charges @ 20 % on (a+b+c)				1048.40	
			e) Contractor's profit @ 10 % on (a+b+c+d)				629.04	
			Rate per cum = (a+b+c+d+e)				6919.44	
						say	<u>6919.00</u>	
12.11 E		(iv)	Grade M30 PCC					
			Same as Item 12.8(f) excluding formwork					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5526.00	
			d) Overhead charges @ 20 % on (a+b+c)				1105.20	
			e) Contractor's profit @ 10 % on (a+b+c+d)				663.12	
			Rate per cum = (a+b+c+d+e)				7294.32	
						say	<u>7294.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.11 E (iv)		Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				5286.00	
			d) Overhead charges @ 20 % on (a+b+c)				1057.20	
			e) Contractor's profit @ 10 % on (a+b+c+d)				634.32	
			Rate per cum = (a+b+c+d+e)				6977.52	
						say	<u>6978.00</u>	
12.11		F	Well cap					
		(i)	RCC Grade M20					
		Case I	Using Concrete Mixer					
			Unit = cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	5.12	8120.00	41574.40	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
			10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
			b) Labour					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			Form Work @ 4 per cent of a+b+c				3095.26	
			d) Overhead charges @ 20 % on (a+b+c)				16095.33	
			e) Contractor's profit @ 10 % on (a+b+c+d)				9657.20	
			cost of 15 cum = a+b+c+d+e				106229.19	
			Rate per cum = (a+b+c+d+e)/15				7081.95	
						say	<u>7082.00</u>	
12.11 F (i)		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
			a) Material					
			Cement	tonne	40.92	8120.00	332270.40	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			b) Labour					
			Mate	day	0.84	300.00	252.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader (capacity 1 cum)	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			Formwork @ 4 per cent of (a+b+c)				23612.26	
			d) Overhead charges @ 20 % on (a+b+c)				122783.73	
			e) Contractor's profit @ 10 % on (a+b+c+d)				73670.24	
			cost of 120 cum = a+b+c+d+e				810372.63	
			Rate per cum = (a+b+c+d+e)/120				6753.11	
						say	<u>6753.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.11 F		(ii)	RCC Grade M25					
		Case I	Using Concrete Mixer					
			<b>Unit = cum</b>					
			<b>Taking output = 15 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	6.05	8120.00	49126.00	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
			10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			Form Work @ 3.75 per cent of a+b+c				3184.99	
			<b>d) Overhead charges @ 20 % on (a+b+c)</b>				17623.60	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				10574.16	
			cost of 15 cum = a+b+c+d+e				116315.74	
			<b>Rate per cum = (a+b+c+d+e)/15</b>				7754.38	
						<b>say</b>	<b>7754.00</b>	
12.11 F (ii)		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	48.40	8120.00	393008.00	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.84	300.00	252.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader (capacity 1 cum)	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			Formwork @ 3.75 per cent of ( a+b+c)				24414.15	
			<b>d) Overhead charges @ 20 % on (a+b+c)</b>				135091.63	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				81054.98	
			cost of 120 cum = a+b+c+d+e				891604.76	
			<b>Rate per cum = (a+b+c+d+e)/120</b>				7430.04	
						<b>say</b>	<b>7430.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.11 F		(iii)	RCC Grade M30					
		Case I	Using Concrete Mixer					
			<b>Unit = cum</b>					
			<b>Taking output = 15 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	6.10	8120.00	49532.00	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
			10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			Formwork @ 3.5 per cent of (a+b+c)				2986.87	
			<b>d) Overhead charges @ 20 % on (a+b+c)</b>				17665.17	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				10599.10	
			cost of 15 cum = a+b+c+d+e				116590.14	
			<b>Rate per cum = (a+b+c+d+e)/15</b>				7772.68	
						<b>say</b>	<b>7773.00</b>	
12.11 F (iii)		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	48.79	8120.00	396174.80	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.84	300.00	252.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader (capacity 1 cum)	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			Formwork @ 3.5 per cent of (a+b+c)				22897.38	
			<b>d) Overhead charges @ 20 % on (a+b+c)</b>				135421.64	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				81252.98	
			cost of 120 cum = a+b+c+d+e				893782.79	
			<b>Rate per cum = (a+b+c+d+e)/120</b>				7448.19	
						<b>say</b>	<b>7448.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.11 F	(iv)		RCC Grade M35					
		Case I	Using Concrete Mixer					
			<b>Unit = cum</b>					
			<b>Taking output = 15 cum</b>					
		a)	<b>Material</b>					
			Cement	tonne	6.33	8120.00	51399.60	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
			10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
		b)	<b>Labour</b>					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
		c)	<b>Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			Formwork @ 3 per cent of (a+b+c)				2616.20	
		d)	<b>Overhead charges @ 20 % on (a+b+c)</b>				17964.56	
		e)	<b>Contractor's profit @ 10 % on (a+b+c+d)</b>				10778.74	
			cost of 15 cum = a+b+c+d+e				118566.09	
			<b>Rate per cum = (a+b+c+d+e)/15</b>				7904.41	
						<b>say</b>	<b>7904.00</b>	
12.11 F (iv)		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			<b>Unit = cum</b>					
			<b>Taking output = 120 cum</b>					
		a)	<b>Material</b>					
			Cement	tonne	50.64	8120.00	411196.80	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
		b)	<b>Labour</b>					
			Mate	day	0.84	300.00	252.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
		c)	<b>Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader (capacity 1 cum)	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	P&M-050 Lead= 0 km
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			Formwork @ 3 per cent of (a+b+c)				20076.98	
		d)	<b>Overhead charges @ 20 % on (a+b+c)</b>				137861.96	
		e)	<b>Contractor's profit @ 10 % on (a+b+c+d)</b>				82717.17	
			cost of 120 cum = a+b+c+d+e				909888.91	
			<b>Rate per cum = (a+b+c+d+e)/120</b>				7582.41	
						<b>say</b>	<b>7582.00</b>	
		Note	Where ever concrete is carried out using batching plant, transit mixer, concrete pump, Admixtures @ 0.4 per cent of weight of cement may be added for achieving desired slump of concrete.					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
'12.11 F		(v)	RCC M40 Grade					
			Using Batching Plant, Transit Mixer and Concrete Pump					
			<i>Unit = cum</i>					
			<i>Taking output = 120 cum</i>					
			<b>a) Material</b>					
			Cement	tonne	52.20	8120.00	423864.00	M-081
			Coarse Sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			Admixture	kg	206.00	55.00	11330.00	M-180
			<b>b) Labour</b>					
			Mate	day	0.84	300.00	252.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
			<b>c) Machinery</b>					
			Batching Plant	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1016.00	15240.00	P&M-049
			Transit Mixer 4 cum capacity for lead beyond 1 km.	tonne.km	300.L	0.00	0.00	P&M-050 Lead= 0 km
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			Formwork @ 3 per cent on cost of concrete i.e. cost of material, labour and machinery				20796.90	
			<b>d) Overhead charges @ 20 % on (a+b+c)</b>				142805.38	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				85683.23	
			cost of 120 cum = a+b+c+d+e				942515.51	
			Rate per cum = (a+b+c+d+e)/120				7854.30	
						<b>say</b>	<b><u>7854.00</u></b>	
12.12	Section 1200		Sinking of 6 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
			<i>Unit = Running Meter.</i>					
			<i>Taking output = 1 m</i>					
			Diameter of well - 6 m.					
		A	Sandy Soil					
		(i)	Depth below bed level upto 3.0 M					
			Rate of sinking = 0.50 m per hour.					
			<b>a) Labour</b>					
			Mate	day	0.12	300.00	36.00	L-12
			Sinker ( skilled )	day	1.00	400.00	400.00	L-15
			Sinking helper ( semi-skilled )	day	2.00	300.00	600.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	2.00	726.00	1452.00	P&M-075
			Consumables in sinking @10 per cent of (b)				145.20	
			<b>c) Overhead charges @ 20 % on (a+b)</b>				526.64	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				315.98	
			Rate per metre = (a+b+c+d)				3475.82	
						<b>say</b>	<b><u>3476.00</u></b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.12 A		(ii)	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking = 0.33 m per hour.					
			<b>a) Labour</b>					
			Mate	day	0.15	300.00	45.00	L-12
			Sinker	day	1.25	400.00	500.00	L-15
			Sinking helper ( semi-skilled )	day	2.50	300.00	750.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories	hour	3.00	726.00	2178.00	P&M-075
			Consumables in sinking @10 per cent of (b)				217.80	
			<b>c) Overhead charges @ 20 % on (a+b)</b>				738.16	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				442.90	
			<b>Rate per metre = (a+b+c+d)</b>				4871.86	
						<b>say</b>	<b><u>4872.00</u></b>	
12.12 A		(iii)	<b>Beyond 10m upto 20m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
			11th m	5%	5116.00			
			12th m	5%	5372.00			
			13th m	5%	5641.00			
			14th m	5%	5923.00			
			15th m	5%	6219.00			
			16th m	5%	6530.00			
			17th m	5%	6857.00			
			18th m	5%	7200.00			
			19th m	5%	7560.00			
			20th m	5%	7938.00			
			Total Cost from 10m upto 20m		64356.00			
			<b>Avg Rate per metre</b>		<b><u>6436.00</u></b>			
12.12 A		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.				Including 20% for Kentledge	
			21st m	7.5%	8533.00		10240.00	
			22nd m	7.5%	9173.00		11008.00	
			23rd m	7.5%	9861.00		11833.00	
			24th m	7.5%	10601.00		12721.00	
			25th m	7.5%	11396.00		13675.00	
			26th m	7.5%	12251.00		14701.00	
			27th m	7.5%	13170.00		15804.00	
			28th m	7.5%	14158.00		16990.00	
			29th m	7.5%	15220.00		18264.00	
			30th m	7.5%	16362.00		19634.00	
			Total Cost from 20m upto 30m		120725.00		144870.00	
			<b>Avg Rate per metre</b>		<b><u>12073.00</u></b>		<b><u>14487.00</u></b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.12 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.			Including 20% for Kentledge		
			31st m	10%	17998.00	21598.00		
			32nd	10%	19798.00	23758.00		
			33rd m	10%	21778.00	26134.00		
			34th m	10%	23956.00	28747.00		
			35th m	10%	26352.00	31622.00		
			36th m	10%	28987.00	34784.00		
			37th m	10%	31886.00	38263.00		
			38th m	10%	35075.00	42090.00		
			39th m	10%	38583.00	46300.00		
			40th m	10%	42441.00	50929.00		
			Total Cost from 30m upto 40m		286854.00	344225.00		
			<b>Avg Rate per metre</b>		<b><u>28685.00</u></b>	<b><u>34423.00</u></b>		
12.12		B	<b>Clayey Soil ( 6m dia. Well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 meter</b>					
		(i)	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking = 0.33 m per hour.					
		a)	<b>Labour</b>					
			Mate	day	0.15	300.00	45.00	L-12
			Sinker ( skilled )	day	1.50	400.00	600.00	L-15
			Sinking helper ( semi-skilled )	day	2.25	300.00	675.00	L-14
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories	hour	3.00	726.00	2178.00	P&M-075
			Consumables in sinking @ 10 per cent of (b)				217.80	
		c)	<b>Overhead charges @ 20 % on (a+b)</b>				743.16	
		d)	<b>Contractor's profit @ 10 % on (a+b+c)</b>				445.90	
			<b>Rate per metre = (a+b+c+d)</b>				4904.86	
							<b>say</b>	<b><u>4905.00</u></b>
12.12 B		(ii)	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking = 0.17 m per hour.					
		a)	<b>Labour</b>					
			Mate	day	0.30	300.00	90.00	L-12
			Sinker	day	3.00	400.00	1200.00	L-15
			Sinking helper ( semi-skilled )	day	4.50	300.00	1350.00	L-14
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	726.00	4356.00	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	2.00	569.00	1138.00	P&M-063
			Consumables in sinking @ 10 per cent of (b)				549.40	
		c)	<b>Overhead charges @ 20 % on (a+b)</b>				1736.68	
		d)	<b>Contractor's profit @ 10 % on (a+b+c)</b>				1042.01	
			<b>Rate per metre = (a+b+c+d)</b>				11462.09	
							<b>say</b>	<b><u>11462.00</u></b>

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.12 B		(iii)	<b>Beyond 10 m upto 20 m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.			Including for dewatering @ 5% of cost, if required		
			11th m	5%	12035.00	12637.00		
			12th m	5%	12637.00	13269.00		
			13th m	5%	13269.00	13932.00		
			14th m	5%	13932.00	14629.00		
			15th m	5%	14629.00	15360.00		
			16th m	5%	15360.00	16128.00		
			17th m	5%	16128.00	16934.00		
			18th m	5%	16934.00	17781.00		
			19th m	5%	17781.00	18670.00		
			20th m	5%	18670.00	19604.00		
			Total Cost from 10m upto 20m		151375.00	158944.00		
			<b>Avg Rate per metre</b>		<b>15138.00</b>	<b>15894.00</b>		
12.12 B		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering of the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).			Including 25% for Kentledge	Including 5% for dewatering, if required	
			21st m	7.5%	20070.00	25088.00	26342.00	
			22nd m	7.5%	21575.00	26969.00	28317.00	
			23rd m	7.5%	23193.00	28991.00	30441.00	
			24th m	7.5%	24932.00	31165.00	32723.00	
			25th m	7.5%	26802.00	33503.00	35178.00	
			26th m	7.5%	28812.00	36015.00	37816.00	
			27th m	7.5%	30973.00	38716.00	40652.00	
			28th m	7.5%	33296.00	41620.00	43701.00	
			29th m	7.5%	35793.00	44741.00	46978.00	
			30th m	7.5%	38477.00	48096.00	50501.00	
			Total Cost from 20m upto 30m		283923.00	354904.00	372649.00	
			<b>Avg Rate per metre</b>		<b>28392.00</b>	<b>35490.00</b>	<b>37265.00</b>	
12.12 B		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
			31st m	10%	42325.00	50790.00	53330.00	
			32nd	10%	46558.00	55870.00	58664.00	
			33rd m	10%	51214.00	61457.00	64530.00	
			34th m	10%	56335.00	67602.00	70982.00	
			35th m	10%	61969.00	74363.00	78081.00	
			36th m	10%	68166.00	81799.00	85889.00	
			37th m	10%	74983.00	89980.00	94479.00	
			38th m	10%	82481.00	98977.00	103926.00	
			39th m	10%	90729.00	108875.00	114319.00	
			40th m	10%	99802.00	119762.00	125750.00	
			Total Cost from 30m upto 40m		674562.00	809475.00	849950.00	
			<b>Avg Rate per metre</b>		<b>67456.00</b>	<b>80948.00</b>	<b>84995.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.12		C	Soft Rock (6m dia well )					
			<i>Unit = Running Meter.</i>					
			<i>Taking output = 1 m</i>					
			Depth in Soft rock strata up to 3m					
			Rate of sinking = 0.25 m per hour.					
			a) Labour					
			Mate	day	0.92	300.00	276.00	L-12
			Sinker ( skilled )	day	3.00	400.00	1200.00	L-15
			Sinking helper ( semi-skilled )	day	20.00	300.00	6000.00	L-14
			Diver	day	0.50	700.00	350.00	L-07
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	726.00	2904.00	P&M-075
			Air compressor with pneumatic breakers	hour	3.50	569.00	1991.50	P&M-063
			Consumables in sinking @ 10 per cent of (b)				489.55	
			Add for dewatering @ of 5 per cent of (a+b), if required				660.55	
			c) Overhead charges @ 20 % on (a+b)				2774.32	
			d) Contractor's profit @ 10 % on (a+b+c)				1664.59	
			Rate per metre = (a+b+c+d)				18310.52	
						say	<b>18311.00</b>	
12.12		D	Hard Rock (6m dia well )					
			<i>Unit = Running Meter</i>					
			<i>Taking output = 1 m</i>					
			Depth in hard rock strata upto 3 m					
			Rate of sinking = 0.17 m per hour.					
			a) Material					
			Gelatine 80 per cent	Kg	4.00	148.00	592.00	M-104
			Electric Detonators	each	18.00	9.90	178.20	M-094/100
			b) Labour					
			Mate	day	1.56	300.00	468.00	L-12
			Driller	day	2.00	300.00	600.00	L-06
			Blaster	day	0.25	300.00	75.00	L-03
			Mazdoor	day	12.00	250.00	3000.00	L-13
			Mazdoor (Skilled)	day	4.00	400.00	1600.00	L-15
			c) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	726.00	4356.00	P&M-075
			Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.00	569.00	1138.00	P&M-063
			Dewatering @ 5 per cent of cost of (b+c), if required.				561.85	
			Consumables in sinking @ 10 per cent of cost of (b).				549.40	
			d) Overhead charges @ 20 % on (a+b+c)				2623.69	
			e) Contractor's profit @ 10 % on (a+b+c+d)				1574.21	
			Rate per metre = (a+b+c+d+e)				17316.35	
						say	<b>17316.00</b>	
12.13	Section 1200		Sinking of 7 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = Running Meter.</b>					
		<b>Taking output = 1 m</b>					
		<b>Diameter of well - 7 m.</b>					
	<b>A</b>	<b>Sandy Soil</b>					
	<b>(i)</b>	<b>Depth below bed level upto 3.0 M</b>					
		Rate of sinking = 0.30 m per hour.					
		<b>a) Labour</b>					
		Mate	day	0.15	300.00	45.00	L-12
		Sinker ( skilled )	day	1.25	400.00	500.00	L-15
		Sinking helper ( semi-skilled )	day	2.50	300.00	750.00	L-14
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	3.25	726.00	2359.50	P&M-075
		Consumables in sinking @10 per cent of (b)				235.95	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				778.09	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				389.05	
		<b>Rate per metre = (a+b+c+d)</b>				5057.59	
<b>12.13 A</b>		<b>(ii) Beyond 3m upto 10m depth</b>				10115.17	
		Rate of sinking = 0.22 m per hour.			<b>say</b>	<b>10115.00</b>	
		<b>a) Labour</b>					
		Mate	day	0.18	300.00	54.00	L-12
		Sinker	day	1.50	400.00	600.00	L-15
		Sinking helper ( semi-skilled )	day	3.00	300.00	900.00	L-14
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.50	726.00	3267.00	P&M-075
		Consumables in sinking @10 per cent of (b)				326.70	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				1029.54	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				617.72	
		<b>Rate per metre = (a+b+c+d)</b>				6794.96	
					<b>say</b>	<b>6795.00</b>	
<b>12.13 A</b>		<b>(iii) Beyond 10m upto 20m</b>					
	<b>a</b>	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		11th m	5%	7135.00			
		12th m	5%	7492.00			
		13th m	5%	7867.00			
		14th m	5%	8260.00			
<b>0.165</b>		15th m	5%	8673.00			
		16th m	5%	9107.00			
		17th m	5%	9562.00			
		18th m	5%	10040.00			
		19th m	5%	10542.00			
		20th m	5%	11069.00			
		Total Cost from 10m upto 20m		89747.00			
		<b>Avg Rate per metre</b>		<b>8975.00</b>			

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.13 A		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge		
			21st m	7.5%	11899.00	14279.00		
			22nd m	7.5%	12791.00	15349.00		
			23rd m	7.5%	13750.00	16500.00		
			24th m	7.5%	14781.00	17737.00		
			25th m	7.5%	15890.00	19068.00		
			26th m	7.5%	17082.00	20498.00		
			27th m	7.5%	18363.00	22036.00		
			28th m	7.5%	19740.00	23688.00		
			29th m	7.5%	21221.00	25465.00		
			30th m	7.5%	22813.00	27376.00		
			Total Cost from 20m upto 30m		168330.00	201996.00		
			<b>Avg Rate per metre</b>		<b>16833.00</b>	<b>20200.00</b>		
12.13 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.			Including 20% for Kentledge		
			31st m	10%	25094.00	30113.00		
			32nd	10%	27603.00	33124.00		
			33rd m	10%	30363.00	36436.00		
			34th m	10%	33399.00	40079.00		
			35th m	10%	36739.00	44087.00		
			36th m	10%	40413.00	48496.00		
			37th m	10%	44454.00	53345.00		
			38th m	10%	48899.00	58679.00		
			39th m	10%	53789.00	64547.00		
			40th m	10%	59168.00	71002.00		
			Total Cost from 30m upto 40m		399921.00	479908.00		
			<b>Avg Rate per metre</b>		<b>39992.00</b>	<b>47991.00</b>		
12.13		B	<b>Clayey Soil ( 7m dia. Well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 cum</b>					
		(I)	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking = 0.22 m per hour.					
		a)	<b>Labour</b>					
			Mate	day	0.18	300.00	54.00	L-12
			Sinker ( skilled )	day	1.50	400.00	600.00	L-15
			Sinking helper ( semi-skilled )	day	3.00	300.00	900.00	L-14
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.50	726.00	3267.00	P&M-075
			Consumables in sinking @ 10 per cent of (b)				326.70	
		d)	<b>Overhead charges @ 20 % on (a+b)</b>				1029.54	
		e)	<b>Contractor's profit @ 10 % on (a+b+c)</b>				617.72	
			<b>Rate per metre = (a+b+c+d)</b>				6794.96	
							<b>say</b>	<b>6795.00</b>

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.13 B		(ii)	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking = 0.17 m per hour.					
			<b>a) Labour</b>					
			Mate	day	0.26	300.00	78.00	L-12
			Sinker	day	2.00	400.00	800.00	L-15
			Sinking helper ( semi-skilled )	day	4.00	300.00	1200.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	726.00	4356.00	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.25	569.00	435.60	P&M-063
			Consumables in sinking @ 10 per cent of (b)				479.16	
			<b>c) Overhead charges @ 20 % on (a+b)</b>				1469.75	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				881.85	
			<b>Rate per metre = (a+b+c+d)</b>				9700.36	
						<b>say</b>	<b><u>9700.00</u></b>	
12.13 B		(iii)	<b>Beyond 10 m upto 20 m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.				Including for dewatering @ 5% of cost, if required	
			11th m	5%	10185.00	10694.00		
			12th m	5%	10694.00	11229.00		
			13th m	5%	11229.00	11790.00		
			14th m	5%	11790.00	12380.00		
			15th m	5%	12380.00	12999.00		
			16th m	5%	12999.00	13649.00		
			17th m	5%	13649.00	14331.00		
			18th m	5%	14331.00	15048.00		
			19th m	5%	15048.00	15800.00		
			20th m	5%	15800.00	16590.00		
			Total Cost from 10m upto 20m		128105.00	134510.00		
			<b>Avg Rate per metre</b>		<b><u>12811.00</u></b>	<b><u>13451.00</u></b>		
12.13 B		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).				Including 25% for Kentledge	Including 5% for dewatering, if required
			31st m	7.5%	16985.00	21231.00	22293.00	
			32nd	7.5%	18259.00	22824.00	23965.00	
			33rd m	7.5%	19628.00	24535.00	25762.00	
			34th m	7.5%	21100.00	26375.00	27694.00	
			35th m	7.5%	22683.00	28354.00	29772.00	
			36th m	7.5%	24384.00	30480.00	32004.00	
			37th m	7.5%	26213.00	32766.00	34404.00	
			38th m	7.5%	28179.00	35224.00	36985.00	
			39th m	7.5%	30292.00	37865.00	39758.00	
			40th m	7.5%	32564.00	40705.00	42740.00	
			Total Cost from 30m upto 40m		240287.00	300359.00	315377.00	
			<b>Avg Rate per metre</b>		<b><u>24029.00</u></b>	<b><u>30036.00</u></b>	<b><u>31538.00</u></b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.13 B		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
			31st m	10%	35820.00	42984.00	45133.00	
			32nd	10%	39402.00	47282.00	49646.00	
			33rd m	10%	43342.00	52010.00	54611.00	
			34th m	10%	47676.00	57211.00	60072.00	
			35th m	10%	52444.00	62933.00	66080.00	
			36th m	10%	57688.00	69226.00	72687.00	
			37th m	10%	63457.00	76148.00	79955.00	
			38th m	10%	69803.00	83764.00	87952.00	
			39th m	10%	76783.00	92140.00	96747.00	
			40th m	10%	84461.00	101353.00	106421.00	
			Total Cost from 30m upto 40m		570876.00	685051.00	719304.00	
			<b>Avg Rate per metre</b>		<b>57088.00</b>	<b>68505.00</b>	<b>71930.00</b>	
12.13		C	<b>Soft Rock ( 7m dia well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in soft rock strata upto 3m</b>					
			Rate of sinking = 0.22 m per hour.					
		a)	<b>Labour</b>					
			Mate	day	0.58	300.00	174.00	L-12
			Sinker ( skilled )	day	4.00	400.00	1600.00	L-15
			Sinking helper ( semi-skilled )	day	10.00	300.00	3000.00	L-14
			Diver	day	0.75	700.00	525.00	L-07
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.50	726.00	3267.00	P&M-075
			Air compressor with pneumatic breakers	hour	3.75	569.00	2133.75	P&M-063
			Consumables in sinking @ 10 per cent of (b)				540.08	
			Add for dewatering @ of 5 per cent of (a+b), if required				534.99	
		c)	<b>Overhead charges @ 20 % on (a+b)</b>				2354.96	
		d)	<b>Contractor's profit @ 10 % on (a+b+c)</b>				1412.98	
			<b>Rate per metre = (a+b+c+d)</b>				15542.75	
						<b>say</b>	<b>15543.00</b>	
12.13		D	<b>Hard Rock ( 7m dia well )</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in Hard rock strata up to 3 m</b>					
			Rate of sinking = 0.17 m per hour.					
		a)	<b>Material</b>					
			Gelatine 80 per cent	Kg	7.00	148.00	1036.00	M-104
			Electric Detonators	each	30.00	9.90	297.00	M-094/100
		b)	<b>Labour</b>					
			Mate	day	1.60	300.00	480.00	L-12
			Driller	day	2.00	300.00	600.00	L-06
			Blaster	day	0.25	300.00	75.00	L-03
			Mazdoor	day	18.00	250.00	4500.00	L-13
			Mazdoor (Skilled)	day	4.00	400.00	1600.00	L-15
			Diver	day	0.50	700.00	350.00	L-07

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	726.00	4356.00	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.00	569.00	1138.00	P&M-063
		Dewatering @ 5 per cent of cost of (b+c), if required.				654.95	
		Consumables in sinking @ 10 per cent of cost of (b).				614.90	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				3140.37	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				1884.22	
		<b>Rate per metre = (a+b+c+d+e)</b>				20726.44	
					<b>say</b>	<b>20726.00</b>	
12.14	Section 1200	Sinking of 8 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
		<b>Unit = Running Meter.</b>					
		<b>Taking output = 1 m</b>					
		Diameter of well - 8 m.					
	A	Sandy Soil					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.25 m/hour					
		<b>a) Labour</b>					
		Mate	day	0.18	300.00	54.00	L-12
		Sinker ( skilled )	day	1.50	400.00	600.00	L-15
		Sinking helper ( semi-skilled )	day	3.00	300.00	900.00	L-14
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	726.00	2904.00	P&M-075
		Consumables in sinking @10 per cent of (b)				290.40	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				949.68	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				569.81	
		<b>Rate per metre = (a+b+c+d)</b>				6267.89	
					<b>say</b>	<b>6268.00</b>	
12.14 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.20 m/hour					
		<b>a) Labour</b>					
		Mate	day	0.25	300.00	75.00	L-12
		Sinker	day	1.75	400.00	700.00	L-15
		Sinking helper ( semi-skilled )	day	3.50	300.00	1050.00	L-14
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	726.00	3630.00	P&M-075
		Consumables in sinking @10 per cent of (b)				363.00	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				1163.60	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				698.16	
		<b>Rate per metre = (a+b+c+d)</b>				7679.76	
					<b>say</b>	<b>7680.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.14 A		(iii)	<b>Beyond 10m upto 20m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
			11th m	5%	8064.00			
			12th m	5%	8467.00			
			13th m	5%	8890.00			
			14th m	5%	9335.00			
			15th m	5%	9802.00			
			16th m	5%	10292.00			
			17th m	5%	10807.00			
			18th m	5%	11347.00			
			19th m	5%	11914.00			
			20th m	5%	12510.00			
			Total Cost from 10m upto 20m			101428.00		
			<b>Avg Rate per metre</b>			<b>10143.00</b>		
12.14 A		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.				Including 20% for Kentledge	
			21st m	7.5%	13448.00	16138.00		
			22nd m	7.5%	14457.00	17348.00		
			23rd m	7.5%	15541.00	18649.00		
			24th m	7.5%	16707.00	20048.00		
			25th m	7.5%	17960.00	21552.00		
			26th m	7.5%	19307.00	23168.00		
			27th m	7.5%	20755.00	24906.00		
			28th m	7.5%	22312.00	26774.00		
			29th m	7.5%	23985.00	28782.00		
			30th m	7.5%	25784.00	30941.00		
			Total Cost from 20m upto 30m		190256.00	228306.00		
			<b>Avg Rate per metre</b>			<b>19026.00</b>	<b>22831.00</b>	
12.14 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.				Including 20% for Kentledge	
			31st m	10%	28362.00	34034.00		
			32nd	10%	31198.00	37438.00		
			33rd m	10%	34318.00	41182.00		
			34th m	10%	37750.00	45300.00		
			35th m	10%	41525.00	49830.00		
			36th m	10%	45678.00	54814.00		
			37th m	10%	50246.00	60295.00		
			38th m	10%	55271.00	66325.00		
			39th m	10%	60798.00	72958.00		
			40th m	10%	66878.00	80254.00		
			Total Cost from 30m upto 40m		66878.00	80254.00		
			<b>Avg Rate per metre</b>			<b>6688.00</b>	<b>8025.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.14		B	Clayey Soil ( 8m dia. Well )					
			<i>Unit = Running Meter.</i>					
			<i>Taking output = 1 meter</i>					
		(i)	Depth from bed level upto 3.0 M					
			Rate of sinking @ 0.18 m/hour					
			a) Labour					
			Mate	day	0.22	300.00	66.00	L-12
			Sinker ( skilled )	day	2.00	400.00	800.00	L-15
			Sinking helper ( semi-skilled )	hour	3.50	300.00	1050.00	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.		5.50	726.00	3993.00	P&M-075
			Consumables in sinking @ 10 per cent of (b)				399.30	
			c) Overhead charges @ 20 % on (a+b)				1261.66	
			d) Contractor's profit @ 10 % on (a+b+c)				757.00	
			Rate per metre = (a+b+c+d)				8326.96	
						say	<b>8327.00</b>	
12.14 B		(ii)	Beyond 3m upto 10m depth					
			Rate of sinking @ 0.17 m/hour					
			a) Labour					
			Mate	day	0.32	300.00	96.00	L-12
			Sinker	day	2.50	400.00	1000.00	L-15
			Sinking helper ( semi-skilled )	day	4.50	300.00	1350.00	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	726.00	4356.00	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.50	569.00	1991.50	P&M-063
			Consumables in sinking @ 10 per cent of (b)				634.75	
			c) Overhead charges @ 20 % on (a+b)				1885.65	
			d) Contractor's profit @ 10 % on (a+b+c)				1131.39	
			Rate per metre = (a+b+c+d)				12445.29	
						say	<b>12445.00</b>	
12.14 B		(iii)	Beyond 10 m upto 20 m					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.					
							Including for dewatering @ 5% of cost, if required	
			11th m	5%	13068.00	13721.00		
			12th m	5%	13721.00	14407.00		
			13th m	5%	14407.00	15127.00		
			14th m	5%	15127.00	15883.00		
			15th m	5%	15883.00	16677.00		
			16th m	5%	16677.00	17511.00		
			17th m	5%	17511.00	18387.00		
			18th m	5%	18387.00	19306.00		
			19th m	5%	19306.00	20271.00		
			20th m	5%	20271.00	21285.00		
			Total Cost from 10m upto 20m		164358.00	172575.00		
			<b>Avg Rate per metre</b>		<b>16436.00</b>	<b>17258.00</b>		

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.14 B		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).			Including 25% for Kentledge	Including 5% for dewatering, if required	
			31st m	7.5%	21791.00	27239.00	28601.00	
			32nd	7.5%	23425.00	29281.00	30745.00	
			33rd m	7.5%	25182.00	31478.00	33052.00	
			34th m	7.5%	27071.00	33839.00	35531.00	
			35th m	7.5%	29101.00	36376.00	38195.00	
			36th m	7.5%	31284.00	39105.00	41060.00	
			37th m	7.5%	33630.00	42038.00	44140.00	
			38th m	7.5%	36152.00	45190.00	47450.00	
			39th m	7.5%	38863.00	48579.00	51008.00	
			40th m	7.5%	41778.00	52223.00	54834.00	
			Total Cost from 30m upto 40m		308277.00	385348.00	404616.00	
			<b>Avg Rate per metre</b>		<b>30828.00</b>	<b>38535.00</b>	<b>40462.00</b>	
12.14 B		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
			31st m	10%	45956.00	55147.00	57904.00	
			32nd	10%	50552.00	60662.00	63695.00	
			33rd m	10%	55607.00	66728.00	70064.00	
			34th m	10%	61168.00	73402.00	77072.00	
			35th m	10%	67285.00	80742.00	84779.00	
			36th m	10%	74014.00	88817.00	93258.00	
			37th m	10%	81415.00	97698.00	102583.00	
			38th m	10%	89557.00	107468.00	112841.00	
			39th m	10%	98513.00	118216.00	124127.00	
			40th m	10%	108364.00	130037.00	136539.00	
			Total Cost from 30m upto 40m		732431.00	878917.00	922862.00	
			<b>Avg Rate per metre</b>		<b>73243.00</b>	<b>87892.00</b>	<b>92286.00</b>	
12.14		C	<b>Soft Rock ( 8m dia well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in soft rock strata upto 3m</b>					
			Rate of sinking @ 0.20 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.68	300.00	204.00	L-12
			Sinker ( skilled )	day	4.00	400.00	1600.00	L-15
			Sinking helper ( semi-skilled )	day	12.00	300.00	3600.00	L-14
			Diver	day	1.00	700.00	700.00	L-07

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	726.00	3630.00	P&M-075
		Air compressor with pneumatic breakers	hour	3.75	569.00	2133.75	P&M-063
		Consumables in sinking @ 10 per cent of (b)				576.38	
		Add for dewatering @ of 5 per cent of (a+b), if required				622.21	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				2613.27	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1567.96	
		<b>Rate per metre = (a+b+c+d)</b>				17247.56	
					<b>say</b>	<b>17248.00</b>	
12.14	D	<b>Hard Rock ( 8m dia well )</b>					
		<b>Unit = Running Meter</b>					
		<b>Taking output = 1 m</b>					
		<b>Depth in hard rock strata upto 3 m</b>					
		Rate of sinking @ 0.17 m/hour					
		<b>a) Material</b>					
		Gelatine 80 per cent	Kg	8.00	148.00	1184.00	M-104
		Electric Detonators	each	32.00	9.90	316.80	M-094/100
		<b>b) Labour</b>					
		Mate	day	1.09	300.00	327.00	L-12
		Driller	day	2.00	300.00	600.00	L-06
		Blaster	day	0.25	300.00	75.00	L-03
		Mazdoor	day	20.00	250.00	5000.00	L-13
		Mazdoor (Skilled)	day	4.00	400.00	1600.00	L-15
		<b>c) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	726.00	4356.00	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.00	569.00	1138.00	P&M-063
		Dewatering @ 5 per cent of cost of (b+c), if required.				654.80	
		Consumables in sinking @ 10 per cent of cost of (b).				760.20	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				3202.36	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				1921.42	
		<b>Rate per metre = (a+b+c+d+e)</b>				21135.58	
					<b>say</b>	<b>21136.00</b>	
12.15	Section 1200	<b>Sinking of 9 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.</b>					
		<b>Unit = Running Meter.</b>					
		<b>Taking output = 1 m</b>					
		<b>Diameter of well - 9 m.</b>					
	A	<b>Sandy Soil</b>					
	(i)	<b>Depth below bed level upto 3.0 M</b>					
		Rate of sinking @ 0.25 m/hour					
		<b>a) Labour</b>					
		Mate	day	0.19	300.00	57.00	L-12
		Sinker ( skilled )	day	1.50	400.00	600.00	L-15
		Sinking helper ( semi-skilled )	day	3.25	300.00	975.00	L-14
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	726.00	2904.00	P&M-075
		Consumables in sinking @10 per cent of (b)				290.40	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				965.28	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Contractor's profit @ 10 % on (a+b+c)				579.17	
		Rate per metre = (a+b+c+d)				6370.85	
					say	<u>6371.00</u>	
12.15 A	(ii)	<b>Beyond 3m upto 10m depth</b>					
		Rate of sinking @ 0.18 m/hour					
		a) Labour					
		Mate	day	0.27	300.00	81.00	L-12
		Sinker	day	1.75	400.00	700.00	L-15
		Sinking helper ( semi-skilled )	day	4.00	300.00	1200.00	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.50	726.00	3993.00	P&M-075
		Consumables in sinking @10 per cent of (b)				399.30	
		c) Overhead charges @ 20 % on (a+b)				1274.66	
		d) Contractor's profit @ 10 % on (a+b+c)				764.80	
		Rate per metre = (a+b+c+d)				8412.76	
					say	<u>8413.00</u>	
12.15 A	(iii)	<b>Beyond 10m upto 20m</b>					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		11th m	5%	8833.00			
		12th m	5%	9275.00			
		13th m	5%	9739.00			
		14th m	5%	10226.00			
		15th m	5%	10737.00			
		16th m	5%	11274.00			
		17th m	5%	11838.00			
		18th m	5%	12430.00			
		19th m	5%	13052.00			
		20th m	5%	13705.00			
		Total Cost from 10m upto 20m		111109.00			
		<b>Avg Rate per metre</b>		<u>11111.00</u>			
12.15 A	(iv)	<b>Beyond 20m upto 30 m</b>					
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.				Including 20% for Kentledge	
		21st m	7.5%	14732.88		17679.00	
		22nd m	7.5%	15838.00		19006.00	
		23rd m	7.5%	17026.00		20431.00	
		24th m	7.5%	18303.00		21964.00	
		25th m	7.5%	19676.00		23611.00	
		26th m	7.5%	21152.00		25382.00	
		27th m	7.5%	22738.00		27286.00	
		28th m	7.5%	24443.00		29332.00	
		29th m	7.5%	26276.00		31531.00	
		30th m	7.5%	28247.00		33896.00	
		Total Cost from 20m upto 30m		208431.88		250118.00	
		<b>Avg Rate per metre</b>		<u>20843.00</u>		<u>25012.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.15 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.			Including 20% for Kentledge		
			31st m	10%	31071.70	37286.00		
			32nd	10%	34179.00	41015.00		
			33rd m	10%	37597.00	45116.00		
			34th m	10%	41357.00	49628.00		
			35th m	10%	45493.00	54592.00		
			36th m	10%	50042.00	60050.00		
			37th m	10%	55046.00	66055.00		
			38th m	10%	60551.00	72661.00		
			39th m	10%	66606.00	79927.00		
			40th m	10%	73267.00	87920.00		
			Total Cost from 30m upto 40m		495209.70	594250.00		
			<b>Avg Rate per metre</b>		<b>49521.00</b>	<b>59425.00</b>		
12.15		B	<b>Clayey Soil ( 9m dia. Well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 cum</b>					
		(i)	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking 0.17 m / hour					
		a)	<b>Labour</b>					
			Mate	day	0.24	300.00	72.00	L-12
			Sinker ( skilled )	day	2.25	400.00	900.00	L-15
			Sinking helper ( semi-skilled )	day	3.75	300.00	1125.00	L-14
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.75	726.00	4174.50	P&M-075
			Consumables in sinking @ 10 per cent of (b)				417.45	
		c)	<b>Overhead charges @ 20 % on (a+b)</b>				1337.79	
		d)	<b>Contractor's profit @ 10 % on (a+b+c)</b>				802.67	
			<b>Rate per metre = (a+b+c+d)</b>				8829.41	
							say	<b>8829.00</b>
12.15 B		(ii)	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking 0.15 m / hour					
		a)	<b>Labour</b>					
			Mate	day	0.34	300.00	102.00	L-12
			Sinker	day	2.50	400.00	1000.00	L-15
			Sinking helper ( semi-skilled )	day	5.00	300.00	1500.00	L-14
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.50	726.00	4719.00	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.75	569.00	2133.75	P&M-063
			Consumables in sinking @ 10 per cent of (b)				685.28	
		c)	<b>Overhead charges @ 20 % on (a+b)</b>				2028.01	
		d)	<b>Contractor's profit @ 10 % on (a+b+c)</b>				1216.80	
			<b>Rate per metre = (a+b+c+d)</b>				13384.83	
							say	<b>13385.00</b>

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.15 B		(iii)	<b>Beyond 10 m upto 20 m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.			Including for dewatering @ 5% of cost, if required		
			11th m	5%	14054.00	14757.00		
			12th m	5%	14757.00	15495.00		
			13th m	5%	15495.00	16270.00		
			14th m	5%	16270.00	17084.00		
			15th m	5%	17084.00	17938.00		
			16th m	5%	17938.00	18835.00		
			17th m	5%	18835.00	19777.00		
			18th m	5%	19777.00	20766.00		
			19th m	5%	20766.00	21804.00		
			20th m	5%	21804.00	22894.00		
			Total Cost from 10m upto 20m		176780.00	185620.00		
			<b>Avg Rate per metre</b>		<b>17678.00</b>	<b>18562.00</b>		
12.15 B		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).			Including 25% for Kentledge	Including 5% for dewatering, if required	
			31st m	7.5%	23439.00	29299.00	30764.00	
			32nd	7.5%	25197.00	31496.00	33071.00	
			33rd m	7.5%	27087.00	33859.00	35552.00	
			34th m	7.5%	29119.00	36399.00	38219.00	
			35th m	7.5%	31303.00	39129.00	41085.00	
			36th m	7.5%	33651.00	42064.00	44167.00	
			37th m	7.5%	36175.00	45219.00	47480.00	
			38th m	7.5%	38888.00	48610.00	51041.00	
			39th m	7.5%	41805.00	52256.00	54869.00	
			40th m	7.5%	44940.00	56175.00	58984.00	
			Total Cost from 30m upto 40m		331604.00	414506.00	435232.00	
			<b>Avg Rate per metre</b>		<b>33160.00</b>	<b>41451.00</b>	<b>43523.00</b>	
12.15 B		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
			31st m	10%	49434.00	59321.00	62287.00	
			32nd	10%	54377.00	65252.00	68515.00	
			33rd m	10%	59815.00	71778.00	75367.00	
			34th m	10%	65797.00	78956.00	82904.00	
			35th m	10%	72377.00	86852.00	91195.00	
			36th m	10%	79615.00	95538.00	100315.00	
			37th m	10%	87577.00	105092.00	110347.00	
			38th m	10%	96335.00	115602.00	121382.00	
			39th m	10%	105969.00	127163.00	133521.00	
			40th m	10%	116566.00	139879.00	146873.00	
			Total Cost from 30m upto 40m		787862.00	945433.00	992706.00	
			<b>Avg Rate per metre</b>		<b>78786.00</b>	<b>94543.00</b>	<b>99271.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.15		C	Soft Rock ( 9m dia well )					
			<i>Unit = Running Meter.</i>					
			<i>Taking output = 1 m</i>					
			Depth in soft rock strata up to 3m					
			Rate of sinking 0.15 m / hour					
			<b>a) Labour</b>					
			Mate	day	0.76	300.00	228.00	L-12
			Sinker ( skilled )	day	4.00	400.00	1600.00	L-15
			Sinking helper ( semi-skilled )	day	14.00	300.00	4200.00	L-14
			Diver	day	1.20	700.00	840.00	L-07
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.50	726.00	4719.00	P&M-075
			Air compressor with pneumatic breakers	hour	4.00	569.00	2276.00	P&M-063
			Consumables in sinking @ 10 per cent of (b)				699.50	
			Add for dewatering @ of 5 per cent of (a+b), if required				1456.25	
			<b>c) Overhead charges @ 20 % on (a+b)</b>				3203.75	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1922.25	
			<b>Rate per metre = (a+b+c+d)</b>				21144.75	
						<b>say</b>	<b><u>21145.00</u></b>	
12.15		D	Hard Rock ( 9m dia well )					
			<i>Unit = Running Meter</i>					
			<i>Taking output = 1 m</i>					
			Depth in hard rock strata upto 3 m					
			Rate of sinking 0.15 m / hour					
			<b>a) Material</b>					
			Gelatine 80 per cent	Kg	10.00	148.00	1480.00	M-104
			Electric Detonators	each	40.00	9.90	396.00	M-094/100
			<b>b) Labour</b>					
			Mate	day	1.17	300.00	351.00	L-12
			Driller	day	2.00	300.00	600.00	L-06
			Blaster	day	0.25	300.00	75.00	L-03
			Mazdoor	day	22.00	250.00	5500.00	L-13
			Mazdoor (Skilled)	day	4.00	400.00	1600.00	L-15
			Diver	day	1.00	700.00	700.00	L-07
			<b>c) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	7.00	726.00	5082.00	P&M-075
			Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.50	569.00	1422.50	P&M-063
			Dewatering @ 5 per cent of cost of (b+c), if required.				766.53	
			Consumables in sinking @ 10 per cent of cost of (b).				882.60	
			<b>d) Overhead charges @ 20 % on (a+b+c)</b>				3771.13	
			<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				2262.68	
			<b>Rate per metre = (a+b+c+d+e)</b>				24889.43	
						<b>say</b>	<b><u>24889.00</u></b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.16	1200		Sinking of 10 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
			<i>Unit = Running Meter</i>					
			<i>Taking output = 1 m</i>					
			Diameter of well - 10 m.					
		<b>A</b>	<b>Sandy Soil</b>					
		(i)	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking 0.20 m / hour					
			<b>a) Labour</b>					
			Mate	day	0.20	300.00	60.00	L-12
			Sinker ( skilled )	day	1.50	400.00	600.00	L-15
			Sinking helper ( semi-skilled )	day	3.50	300.00	1050.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	726.00	3630.00	P&M-075
			Consumables in sinking @10 per cent of (b)				363.00	
			<b>c) Overhead charges @ 20 % on (a+b)</b>				1140.60	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				684.36	
			<b>Rate per metre = (a+b+c+d)</b>				7527.96	
						<b>say</b>	<b><u>7528.00</u></b>	
12.16 A		(ii)	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking 0.17 m / hour					
			<b>a) Labour</b>					
			Mate	day	0.31	300.00	93.00	L-12
			Sinker	day	2.00	400.00	800.00	L-15
			Sinking helper ( semi-skilled )	day	4.25	300.00	1275.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.75	726.00	4174.50	P&M-075
			Consumables in sinking @10 per cent of (b)				417.45	
			<b>c) Overhead charges @ 20 % on (a+b)</b>				1351.99	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				811.19	
			<b>Rate per metre = (a+b+c+d)</b>				8923.13	
						<b>say</b>	<b><u>8923.00</u></b>	
12.16 A		(iii)	<b>Beyond 10m upto 20m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
			11th m	5%	9369.00			
			12th m	5%	9837.00			
			13th m	5%	10329.00			
			14th m	5%	10845.00			
			15th m	5%	11387.00			
			16th m	5%	11956.00			
			17th m	5%	12554.00			
			18th m	5%	13182.00			
			19th m	5%	13841.00			
			20th m	5%	14533.00			
			Total Cost from 10m upto 20m		117833.00			
			<b>Avg Rate per metre</b>		<b><u>11783.00</u></b>			

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.16 A		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.			Including 20% for Kentledge		
			21st m	7.5%	15623.00	18748.00		
			22nd m	7.5%	16795.00	20154.00		
			23rd m	7.5%	18055.00	21666.00		
			24th m	7.5%	19409.00	23291.00		
			25th m	7.5%	20865.00	25038.00		
			26th m	7.5%	22430.00	26916.00		
			27th m	7.5%	24112.00	28934.00		
			28th m	7.5%	25920.00	31104.00		
			29th m	7.5%	27864.00	33437.00		
			30th m	7.5%	29954.00	35945.00		
			Total Cost from 20m upto 30m		221027.00	265233.00		
			<b>Avg Rate per metre</b>		<b>22103.00</b>	<b>26523.00</b>		
12.16 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.			Including 20% for Kentledge		
			31st m	10%	32949.00	39539.00		
			32nd	10%	36244.00	43493.00		
			33rd m	10%	39868.00	47842.00		
			34th m	10%	43855.00	52626.00		
			35th m	10%	48241.00	57889.00		
			36th m	10%	53065.00	63678.00		
			37th m	10%	58372.00	70046.00		
			38th m	10%	64209.00	77051.00		
			39th m	10%	70630.00	84756.00		
			40th m	10%	77693.00	93232.00		
			Total Cost from 30m upto 40m		525126.00	630152.00		
			<b>Avg Rate per metre</b>		<b>52513.00</b>	<b>63015.00</b>		
12.16		B	<b>Clayey Soil (10m dia. Well )</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 1 cum</b>					
		(i)	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking 0.18m/hour.					
		a)	<b>Labour</b>					
			Mate	day	0.25	300.00	75.00	L-12
			Sinker ( skilled )	day	2.50	400.00	1000.00	L-15
			Sinking helper ( semi-skilled )	day	5.50	300.00	1650.00	L-14
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	726.00	4356.00	P&M-075
			Consumables in sinking @ 10 per cent of (b)				435.60	
		c)	<b>Overhead charges @ 20 % on (a+b)</b>				1503.32	
		d)	<b>Contractor's profit @ 10 % on (a+b+c)</b>				901.99	
			<b>Rate per metre = (a+b+c+d)</b>				9921.91	
						<b>say</b>	<b>9922.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.16 B		(ii)	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking 0.15m/hour.					
			<b>a) Labour</b>					
			Mate	day	0.40	300.00	120.00	L-12
			Sinker	day	3.00	400.00	1200.00	L-15
			Sinking helper ( semi-skilled )	day	5.50	300.00	1650.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	726.00	4356.00	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay	hour	4.00	569.00	2276.00	P&M-063
			Consumables in sinking @ 10 per cent of (b)				663.20	
			<b>c) Overhead charges @ 20 % on (a+b)</b>				2053.04	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1231.82	
			<b>Rate per metre = (a+b+c+d)</b>				13550.06	
						<b>say</b>	<b><u>13550.00</u></b>	
12.16 B		(iii)	<b>Beyond 10 m upto 20 m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.					
							Including for dewatering @ 5% of cost, if required	
			11th m	5%	14228.00	14939.00		
			12th m	5%	14939.00	15686.00		
			13th m	5%	15686.00	16470.00		
			14th m	5%	16470.00	17294.00		
			15th m	5%	17294.00	18159.00		
			16th m	5%	18159.00	19067.00		
			17th m	5%	19067.00	20020.00		
			18th m	5%	20020.00	21021.00		
			19th m	5%	21021.00	22072.00		
			20th m	5%	22072.00	23176.00		
			Total Cost from 10m upto 20m		178956.00	187904.00		
			<b>Avg Rate per metre</b>		<b><u>17896.00</u></b>	<b><u>18790.00</u></b>		
12.16 B		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).					
							Including 25% for Kentledge	Including 5% for dewatering, if required
			31st m	7.5%	23727.00	29659.00	31142.00	
			32nd	7.5%	25507.00	31884.00	33478.00	
			33rd m	7.5%	27420.00	34275.00	35989.00	
			34th m	7.5%	29477.00	36846.00	38688.00	
			35th m	7.5%	31688.00	39610.00	41591.00	
			36th m	7.5%	34065.00	42581.00	44710.00	
			37th m	7.5%	36620.00	45775.00	48064.00	
			38th m	7.5%	39367.00	49209.00	51669.00	
			39th m	7.5%	42320.00	52900.00	55545.00	
			40th m	7.5%	45494.00	56868.00	59711.00	
			Total Cost from 30m upto 40m		335685.00	419607.00	440587.00	
			<b>Avg Rate per metre</b>		<b><u>33569.00</u></b>	<b><u>41961.00</u></b>	<b><u>44059.00</u></b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.16 B		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
			31st m	10%	50043.00	60052.00	63055.00	
			32nd	10%	55047.00	66056.00	69359.00	
			33rd m	10%	60552.00	72662.00	76295.10	
			34th m	10%	66607.00	79928.00	83924.40	
			35th m	10%	73268.00	87922.00	92318.10	
			36th m	10%	80595.00	96714.00	101549.70	
			37th m	10%	88655.00	106386.00	111705.30	
			38th m	10%	97521.00	117025.00	122876.25	
			39th m	10%	107273.00	128728.00	135164.40	
			40th m	10%	118000.00	141600.00	148680.00	
			Total Cost from 30m upto 40m		797561.00	957073.00	1004927.25	
			<b>Avg Rate per metre</b>		<b>79756.00</b>	<b>95707.00</b>	<b>100493.00</b>	
12.16		C	<b>Soft Rock (10m dia well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in soft rock strata upto 3m</b>					
			Rate of sinking 0.14m/hour.					
		a)	<b>Labour</b>					
			Mate	day	0.86	300.00	258.00	L-12
			Sinker ( skilled )	day	4.00	400.00	1600.00	L-15
			Sinking helper ( semi-skilled )	day	16.00	300.00	4800.00	L-14
			Diver	day	1.40	700.00	980.00	L-07
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	7.00	726.00	5082.00	P&M-075
			Air compressor with pneumatic breakers	hour	4.25	569.00	2418.25	P&M-063
			Consumables in sinking @ 10 per cent of (b)				750.03	
			Add for dewatering @ 5 per cent of cost, if required				412.51	
		c)	<b>Overhead charges @ 20 % on (a+b)</b>				3260.16	
		d)	<b>Contractor's profit @ 10 % on (a+b+c)</b>				1956.09	
			<b>Rate per metre = (a+b+c+d)</b>				21517.04	
						<b>say</b>	<b>21517.00</b>	
12.16		D	<b>Hard Rock (10m dia well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in hard rock strata upto 3 m</b>					
			Rate of sinking 0.12 m/ hour.					
		a)	<b>Material</b>					
			Gelatine 80 per cent	Kg	11.00	148.00	1628.00	M-104
			Electric Detonators	each.	44.00	9.90	435.60	M-094/100
		b)	<b>Labour</b>					
			Mate	day	1.27	300.00	381.00	L-12
			Driller	day	2.00	300.00	600.00	L-06
			Blaster	day	0.25	300.00	75.00	L-03
			Mazdoor	day	24.00	250.00	6000.00	L-13
			Mazdoor (Skilled)	day	4.00	400.00	1600.00	L-15

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.50	726.00	6171.00	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	3.00	569.00	1707.00	P&M-063
		Dewatering @ 5 per cent of cost (c), if required.				393.90	
		Consumables in sinking @ 10 per cent of cost of (b+c).				1692.79	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				4136.86	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				2482.11	
		<b>Rate per metre = (a+b+c+d+e)</b>				27303.26	
					<b>say</b>	<b>27303.00</b>	
12.17	1200	Sinking of 11 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
		<b>Unit = Running Meter</b>					
		<b>Taking output = 0.50 m</b>					
		<b>Diameter of well - 11 m.</b>					
	<b>A</b>	<b>Sandy Soil</b>					
	<b>(i)</b>	<b>Depth from bed level upto 3.0 M</b>					
		Rate of sinking @ 0.15 m/hour					
		<b>a) Labour</b>					
		Mate	day	0.21	300.00	63.00	L-12
		Sinker ( skilled )	day	1.50	400.00	600.00	L-15
		Sinking helper (semi-skilled)	day	3.30	300.00	990.00	L-14
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	726.00	4356.00	P&M-075
		Consumables in sinking @10 per cent of (b)				435.60	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				1288.92	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				773.35	
		Cost for 0.5m = a+b+c+d				8506.87	
		<b>Rate per metre = (a+b+c+d)/0.50</b>				17013.74	
					<b>say</b>	<b>17014.00</b>	
12.17 A		<b>(ii) Beyond 3m upto 10m depth</b>					
		Rate of sinking @ 0.13 m/hour					
		<b>a) Labour</b>					
		Mate	day	0.32	300.00	96.00	L-12
		Sinker	day	2.00	400.00	800.00	L-15
		Sinking helper (semi-skilled)	day	4.50	300.00	1350.00	L-14
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	726.00	2904.00	P&M-075
		Consumables in sinking @10 per cent of (b)				290.40	
		<b>c) Overhead charges @ 20 % on (a+b+c)</b>				1088.08	
		<b>d) Contractor's profit @ 10 % on (a+b+c+d)</b>				652.85	
		Cost for 0.5m = a+b+c+d				7181.33	
		<b>Rate per metre = (a+b+c+d)/0.50</b>				14362.66	
					<b>say</b>	<b>14363.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.17 A		(iii)	<b>Beyond 10m upto 20m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
			11th m	5%	15081.00			
			12th m	5%	15835.00			
			13th m	5%	16627.00			
			14th m	5%	17458.00			
			15th m	5%	18331.00			
			16th m	5%	19248.00			
			17th m	5%	20210.00			
			18th m	5%	21221.00			
			19th m	5%	22282.00			
			20th m	5%	23396.00			
			Total Cost from 10m upto 20m			189689.00		
			<b>Avg Rate per metre</b>			<b>18969.00</b>		
12.17 A		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.				Including 20% for Kentledge	
			21st m	7.5%	25151.00	30181.00		
			22nd m	7.5%	27037.00	32444.00		
			23rd m	7.5%	29065.00	34878.00		
			24th m	7.5%	31245.00	37494.00		
			25th m	7.5%	33588.00	40306.00		
			26th m	7.5%	36107.00	43328.00		
			27th m	7.5%	38815.00	46578.00		
			28th m	7.5%	41726.00	50071.00		
			29th m	7.5%	44855.00	53826.00		
			30th m	7.5%	48219.00	57863.00		
			Total Cost from 20m upto 30m		355808.00	426969.00		
			<b>Avg Rate per metre</b>			<b>35581.00</b>	<b>42697.00</b>	
12.17 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.				Including 20% for Kentledge	
			31st m	10%	53041.00	63649.00		
			32nd	10%	58345.00	70014.00		
			33rd m	10%	64180.00	77016.00		
			34th m	10%	70598.00	84718.00		
			35th m	10%	77658.00	93190.00		
			36th m	10%	85424.00	102509.00		
			37th m	10%	93966.00	112759.00		
			38th m	10%	103363.00	124036.00		
			39th m	10%	113699.00	136439.00		
			40th m	10%	125069.00	150083.00		
			Total Cost from 30m upto 40m		845343.00	1014413.00		
			<b>Avg Rate per metre</b>			<b>84534.00</b>	<b>101441.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.17		B	Clayey Soil (11 m dia. Well )					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 0.50 meter</b>					
		(i)	Depth from bed level upto 3.0 M					
			Rate of sinking @ 0.10 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.26	300.00	78.00	L-12
			Sinker ( skilled )	day	2.50	400.00	1000.00	L-15
			Sinking helper (semi-skilled)	day	4.00	300.00	1200.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	726.00	3630.00	P&M-075
			Consumables in sinking @ 10 per cent of (b)				363.00	
			<b>c) Overhead charges @ 20 % on (a+b)</b>				1254.20	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				752.52	
			Cost for 0.5m = a+b+c+d				8277.72	
			<b>Rate per metre = (a+b+c+d)/0.50</b>				16555.44	
							<b>say</b>	<b>16555.00</b>
12.17 B		(ii)	Beyond 3m upto 10m depth					
			Rate of sinking @ 0.08 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.43	300.00	129.00	L-12
			Sinker	day	3.50	400.00	1400.00	L-15
			Sinking helper (semi-skilled)	day	5.75	300.00	1725.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	726.00	4356.00	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay	hour	4.25	569.00	2418.25	P&M-063
			Consumables in sinking @ 10 per cent of (b)				677.43	
			<b>c) Overhead charges @ 20 % on (a+b)</b>				2141.14	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1284.68	
			Cost for 0.5m = a+b+c+d				14131.49	
			<b>Rate per metre = (a+b+c+d)/0.50</b>				28262.98	
							<b>say</b>	<b>28263.00</b>
12.17 B		(iii)	Beyond 10 m upto 20 m					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.					
							Including for dewatering @ 5% of cost, if required	
			11th m	5%	29676.00	31160.00		
			12th m	5%	31160.00	32718.00		
			13th m	5%	32718.00	34354.00		
			14th m	5%	34354.00	36072.00		
			15th m	5%	36072.00	37876.00		
			16th m	5%	37876.00	39770.00		
			17th m	5%	39770.00	41759.00		
			18th m	5%	41759.00	43847.00		
			19th m	5%	43847.00	46039.00		
			20th m	5%	46039.00	48341.00		
			Total Cost from 10m upto 20m		373271.00	391935.00		
			<b>Avg Rate per metre</b>		<b>37327.00</b>	<b>39194.00</b>		

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.17 B		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).			Including 25% for Kentledge	Including 5% for dewatering, if required	
			31st m	7.5%	49492.00	61865.00	64958.00	
			32nd	7.5%	53204.00	66505.00	69830.00	
			33rd m	7.5%	57194.00	71493.00	75068.00	
			34th m	7.5%	61484.00	76855.00	80698.00	
			35th m	7.5%	66095.00	82619.00	86750.00	
			36th m	7.5%	71052.00	88815.00	93256.00	
			37th m	7.5%	76381.00	95476.00	100250.00	
			38th m	7.5%	82110.00	102638.00	107770.00	
			39th m	7.5%	88268.00	110335.00	115852.00	
			40th m	7.5%	94888.00	118610.00	124541.00	
			Total Cost from 30m upto 40m		700168.00	875211.00	918972.00	
			<b>Avg Rate per metre</b>		<b>70017.00</b>	<b>87521.00</b>	<b>91897.00</b>	
12.17 B		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
			31st m	10%	104377.00	125252.00	131515.00	
			32nd	10%	114815.00	137778.00	144667.00	
			33rd m	10%	126297.00	151556.00	159134.00	
			34th m	10%	138927.00	166712.00	175048.00	
			35th m	10%	152820.00	183384.00	192553.00	
			36th m	10%	168102.00	201722.00	211808.00	
			37th m	10%	184912.00	221894.00	232989.00	
			38th m	10%	203403.00	244084.00	256288.00	
			39th m	10%	223743.00	268492.00	281917.00	
			40th m	10%	246117.00	295340.00	310107.00	
			Total Cost from 30m upto 40m		1663513	1996214	2096026	
			<b>Avg Rate per metre</b>		<b>166351.00</b>	<b>199621.00</b>	<b>209603.00</b>	
12.17		C	<b>Soft Rock (11m dia well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 0.50 m</b>					
			<b>Depth in soft rock strata upto 3m</b>					
			Rate of sinking @ 0.06 m/hour					
		a)	<b>Labour</b>					
			Mate	day	0.95	300.00	285.00	L-12
			Sinker ( skilled )	day	4.25	400.00	1700.00	L-15
			Sinking helper (semi-skilled)	day	18.00	300.00	5400.00	L-14
			Diver	day	1.50	700.00	1050.00	L-07

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.00	726.00	5808.00	P&M-075
		Air compressor with pneumatic breakers	hour	4.50	569.00	2560.50	P&M-063
		Consumables in sinking @ 10 per cent of (b)				836.85	
		Add for dewatering @ 5 per cent of cost, if required				460.27	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				3620.12	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2172.07	
		Cost for 0.5m = a+b+c+d				23892.82	
		<b>Rate per metre = (a+b+c+d)/0.50</b>				47785.63	
					<b>say</b>	<b>47786.00</b>	
12.17	D	<b>Hard Rock (11m dia well )</b>					
		<b>Unit = Running Meter.</b>					
		<b>Taking output = 0.50 m</b>					
		<b>Depth in hard rock upto 3 m</b>					
		Rate of sinking @ 0.05 m/hour					
		<b>a) Material</b>					
		Gelatine 80 per cent	Kg	12.00	148.00	1776.00	M-104
		Electric Detonators	each.	48.00	9.90	475.20	M-094/100
		<b>b) Labour</b>					
		Mate	day	1.35	300.00	405.00	L-12
		Driller	day	2.00	300.00	600.00	L-06
		Blaster	day	0.25	300.00	75.00	L-03
		Mazdoor	day	26.00	250.00	6500.00	L-13
		Mazdoor (Skilled)	day	4.00	400.00	1600.00	L-15
		<b>c) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	10.00	726.00	7260.00	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	3.50	569.00	1991.50	P&M-063
		Dewatering @ 5 per cent of cost (c), if required.				462.58	
		Consumables in sinking @ 10 per cent of cost of (b+c).				1843.15	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				4597.69	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				2758.61	
		Cost for 0.5m = a+b+c+d				30344.72	
		<b>Rate per metre = (a+b+c+d)/0.50</b>				60689.44	
					<b>say</b>	<b>60689.00</b>	
12.18	1200	<b>Sinking of 12 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.</b>					
		<b>Unit = Running Meter</b>					
		<b>Taking output = 0.25 m</b>					
		Diameter of well - 12 m.					
	A	<b>Sandy Soil</b>					
	(i)	<b>I) Depth below bed level upto 3.0 M</b>					
		Rate of sinking @ 0.05 m/hour					
		<b>a) Labour</b>					
		Mate	day	0.22	300.00	66.00	L-12
		Sinker ( skilled )	day	1.75	400.00	700.00	L-15
		Sinking helper (semi-skilled)	day	4.00	300.00	1200.00	L-14

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	726.00	4356.00	P&M-075
		Consumables in sinking @10 per cent of (b)				435.60	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				1351.52	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				810.91	
		Cost for 0.25m = a+b+c+d				8920.03	
		<b>Rate per metre = (a+b+c+d)/0.25</b>				35680.13	
					<b>say</b>	<b><u>35680.00</u></b>	
12.18 A	(ii)	<b>Beyond 3m upto 10m depth</b>					
		Rate of sinking @ 0.038 m/hour					
		<b>a) Labour</b>					
		Mate	day	0.37	300.00	111.00	L-12
		Sinker	day	2.50	400.00	1000.00	L-15
		Sinking helper (semi-skilled)	day	4.75	300.00	1425.00	L-14
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.50	726.00	4719.00	P&M-075
		Consumables in sinking @10 per cent of (b)				471.90	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				1545.38	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				927.23	
		Cost for 0.25m = a+b+c+d				10199.51	
		<b>Rate per metre = (a+b+c+d)/0.25</b>				40798.03	
					<b>say</b>	<b><u>40798.00</u></b>	
12.18 A	(iii)	<b>Beyond 10m upto 20m</b>					
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		11th m	5%	42838.00			
		12th m	5%	44980.00			
		13th m	5%	47229.00			
		14th m	5%	49590.45			
		15th m	5%	52069.97			
		16th m	5%	54673.47			
		17th m	5%	57407.14			
		18th m	5%	60277.50			
		19th m	5%	63291.38			
		20th m	5%	66455.95			
		Total Cost from 10m upto 20m		538812.86			
		<b>Avg Rate per metre</b>		<b><u>53881.00</u></b>			
12.18 A	(iv)	<b>Beyond 20m upto 30 m</b>					
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.					
		21st m	7.5%	71440.00		85728.00	
		22nd m	7.5%	76798.00		92158.00	
		23rd m	7.5%	82558.00		99070.00	
		24th m	7.5%	88750.00		106500.00	
		25th m	7.5%	95406.00		114487.00	
		26th m	7.5%	102561.00		123073.00	
		27th m	7.5%	110253.00		132304.00	
		28th m	7.5%	118522.00		142226.00	
		29th m	7.5%	127411.00		152893.00	
		30th m	7.5%	136967.00		164360.00	
		Total Cost from 20m upto 30m		1010666.00		1212799.00	
		<b>Avg Rate per metre</b>		<b><u>101067.00</u></b>		<b><u>121280.00</u></b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.18 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.			Including 20% for Kentledge		
			31st m	10%	150664.00	180797.00		
			32nd	10%	165730.00	198876.00		
			33rd m	10%	182303.00	218764.00		
			34th m	10%	200533.00	240640.00		
			35th m	10%	220586.00	264703.00		
			36th m	10%	242645.00	291174.00		
			37th m	10%	266910.00	320292.00		
			38th m	10%	293601.00	352321.00		
			39th m	10%	322961.00	387553.00		
			40th m	10%	355257.00	426308.00		
			Total Cost from 30m upto 40m		2401190	2881428		
			<b>Avg Rate per metre</b>		<b>240119.00</b>	<b>288143.00</b>		
12.18		B	<b>Clayey Soil (12 m dia. Well)</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 0.25 meter.</b>					
		(i)	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking @ 0.04 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.30	300.00	90.00	L-12
			Sinker ( skilled )	day	3.00	400.00	1200.00	L-15
			Sinking helper (semi-skilled)	day	4.50	300.00	1350.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.25	726.00	4537.50	P&M-075
			Consumables in sinking @ 10 per cent of (b)				453.75	
			<b>c) Overhead charges @ 20 % on (a+b)</b>				1526.25	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				915.75	
			Cost for 0.25m = a+b+c+d				10073.25	
			<b>Rate per metre = (a+b+c+d)/0.25</b>				40293.00	
						<b>say</b>	<b>40293.00</b>	
12.18 B		(ii)	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking @ 0.03 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.48	300.00	144.00	L-12
			Sinker	day	3.75	400.00	1500.00	L-15
			Sinking helper (semi-skilled)	day	6.00	300.00	1800.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.33	726.00	6047.58	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.50	569.00	2560.50	P&M-063
			Consumables in sinking @ 10 per cent of (b)				860.81	
			<b>c) Overhead charges @ 20 % on (a+b)</b>				2582.58	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1549.55	
			Cost for 0.25m = a+b+c+d				17045.01	
			<b>Rate per metre = (a+b+c+d)/0.25</b>				68180.05	
						<b>say</b>	<b>68180.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.18 B		(iii)	<b>Beyond 10 m upto 20 m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.					Including for dewatering @ 5% of cost, if required
			11th m	5%	71589.00	75168.00		
			12th m	5%	75168.00	78926.00		
			13th m	5%	78926.00	82872.00		
			14th m	5%	82872.00	87016.00		
			15th m	5%	87016.00	91367.00		
			16th m	5%	91367.00	95935.00		
			17th m	5%	95935.00	100732.00		
			18th m	5%	100732.00	105769.00		
			19th m	5%	105769.00	111057.00		
			20th m	5%	111057.00	116610.00		
			Total Cost from 10m upto 20m		900431.00	945452.00		
			<b>Avg Rate per metre</b>		<b>90043.00</b>	<b>94545.00</b>		
12.18 B		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).					Including 25% for Kentledge Including 5% for dewatering, if required
			31st m	7.5%	119386.00	149233.00	156695.00	
			32nd	7.5%	128340.00	160425.00	168446.00	
			33rd m	7.5%	137966.00	172458.00	181081.00	
			34th m	7.5%	148313.00	185391.00	194661.00	
			35th m	7.5%	159436.00	199295.00	209260.00	
			36th m	7.5%	171394.00	214243.00	224955.00	
			37th m	7.5%	184249.00	230311.00	241827.00	
			38th m	7.5%	198068.00	247585.00	259964.00	
			39th m	7.5%	212923.00	266154.00	279462.00	
			40th m	7.5%	228892.00	286115.00	300421.00	
			Total Cost from 30m upto 40m		1688967	2111210	2216772	
			<b>Avg Rate per metre</b>		<b>168897.00</b>	<b>211121.00</b>	<b>221677.00</b>	
12.18 B		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
		31st m	10%	251781.00	302137.00	317244.00	
		32nd	10%	276959.00	332351.00	348969.00	
		33rd m	10%	304655.00	365586.00	383865.00	
		34th m	10%	335121.00	402145.00	422252.00	
		35th m	10%	368633.00	442360.00	464478.00	
		36th m	10%	405496.00	486595.00	510925.00	
		37th m	10%	446046.00	535255.00	562018.00	
		38th m	10%	490651.00	588781.00	618220.00	
		39th m	10%	539716.00	647659.00	680042.00	
		40th m	10%	593688.00	712426.00	748047.00	
		Total Cost from 30m upto 40m		4012746	4815295	5056060	
		<b>Avg Rate per metre</b>		<b>401275.00</b>	<b>481530.00</b>	<b>505606.00</b>	
12.18	C	<b>Soft Rock (12m dia well )</b>					
		<b>Unit = Running Meter</b>					
		<b>Taking output = 0.25 m</b>					
		<b>Depth in soft rock strata upto 3m</b>					
		Rate of sinking @ 0.025 m/hour					
		<b>a) Labour</b>					
		Mate	day	1.06	300.00	318.00	L-12
		Sinker ( skilled )	day	4.50	400.00	1800.00	L-15
		Sinking helper (semi-skilled)	day	20.00	300.00	6000.00	L-14
		Diver	day	1.75	700.00	1225.00	L-07
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	10.00	726.00	7260.00	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.75	569.00	2702.75	P&M-063
		Consumables in sinking @ 10 per cent of (b)				996.28	
		Add for dewatering @ 5 per cent, if required				547.95	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				4170.00	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2502.00	
		Cost for 0.25m = a+b+c+d				27521.97	
		<b>Rate per metre = (a+b+c+d)/0.25</b>				110087.87	
					say	<b>110088.00</b>	
12.18	D	<b>Hard Rock (12m dia well )</b>					
		<b>Unit = Running Meter</b>					
		<b>Taking output = 0.25 m</b>					
	(i)	<b>Depth in hard rock strata upto 3 m</b>					
		Rate of sinking @ 0.020 m/hour					
		<b>a) Material</b>					
		Gelatine 80 per cent	Kg	14.00	148.00	2072.00	M-104
		Electric detonator	each.	56.00	9.90	554.40	M-094/100
		<b>b) Labour</b>					
		Mate	day	1.44	300.00	432.00	L-12
		Driller	day	2.00	300.00	600.00	L-06
		Blaster	day	0.25	300.00	75.00	L-03
		Mazdoor	day	28.00	250.00	7000.00	L-13
		Mazdoor (Skilled)	day	4.50	400.00	1800.00	L-15

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	12.50	726.00	9075.00	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	4.00	569.00	2276.00	P&M-063
		Dewatering @ 5 per cent, if required.				567.55	
		Consumables in sinking @ 10 per cent of (c).				1191.86	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				5128.76	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				3077.26	
		<b>Cost for 0.25m = a+b+c+d+e</b>				33849.82	
		<b>Rate per metre = (a+b+c+d+e)/0.25</b>				135399.29	
					<b>say</b>	<b>135399.00</b>	
12.19	1200	Sinking of Twin D Type well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
		<b>Unit = Running Meter</b>					
		<b>Taking output = 1 m</b>					
		<b>Dimensions of well.</b>					
		Overall length = 12 m					
		Overall width = 6 m					
		<b>A Sandy Soil</b>					
		<b>(i) Depth from bed level upto 3.0 M</b>					
		Rate of sinking @ 0.18 m/hour					
		<b>a) Labour</b>					
		Mate	day	0.20	300.00	60.00	L-12
		Sinker ( skilled )	day	1.25	400.00	500.00	L-15
		Sinking helper (semi-skilled)	day	3.75	300.00	1125.00	L-14
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.50	726.00	3993.00	P&M-075
		Consumables in sinking @10 per cent of (b)				399.30	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				1215.46	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				729.28	
		<b>Rate per metre = (a+b+c+d)</b>				8022.04	
					<b>say</b>	<b>8022.00</b>	
12.19 A		<b>(ii) Beyond 3m upto 10m depth</b>					
		Rate of sinking @ 0.17 m/hour					
		<b>a) Labour</b>					
		Mate	day	0.30	300.00	90.00	L-12
		Sinker	day	1.50	400.00	600.00	L-15
		Sinking helper (semi-skilled)	day	4.00	300.00	1200.00	L-14
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.88	726.00	4268.88	P&M-075
		Consumables in sinking @10 per cent of (b)				426.89	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				1317.15	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				790.29	
		<b>Rate per metre = (a+b+c+d)</b>				8693.21	
					<b>say</b>	<b>8693.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.19 A		(iii)	<b>Beyond 10m upto 20m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
			11th m	5%	9128.00			
			12th m	5%	9584.00			
			13th m	5%	10063.00			
			14th m	5%	10566.00			
			15th m	5%	11094.00			
			16th m	5%	11649.00			
			17th m	5%	12231.00			
			18th m	5%	12843.00			
			19th m	5%	13485.00			
			20th m	5%	14159.00			
			Total Cost from 10m upto 20m			114802.00		
			<b>Avg Rate per metre</b>			<b>11480.00</b>		
12.19 A		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.				Including 20% for Kentledge	
			21st m	7.5%	15221.00	18265.00		
			22nd m	7.5%	16363.00	19636.00		
			23rd m	7.5%	17590.00	21108.00		
			24th m	7.5%	18909.00	22691.00		
			25th m	7.5%	20327.00	24392.00		
			26th m	7.5%	21852.00	26222.00		
			27th m	7.5%	23491.00	28189.00		
			28th m	7.5%	25253.00	30304.00		
			29th m	7.5%	27147.00	32576.00		
			30th m	7.5%	29183.00	35020.00		
			Total Cost from 20m upto 30m		215336.00	258403.00		
			<b>Avg Rate per metre</b>			<b>21534.00</b>	<b>25840.00</b>	
12.19 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.				Including 20% for Kentledge	
			31st m	10%	32101.00	38521.00		
			32nd	10%	35311.00	42373.00		
			33rd m	10%	38842.00	46610.00		
			34th m	10%	42726.00	51271.00		
			35th m	10%	46999.00	56399.00		
			36th m	10%	51699.00	62039.00		
			37th m	10%	56869.00	68243.00		
			38th m	10%	62556.00	75067.00		
			39th m	10%	68812.00	82574.00		
			40th m	10%	75693.00	90832.00		
			Total Cost from 30m upto 40m		511608.00	613929.00		
			<b>Avg Rate per metre</b>			<b>51161.00</b>	<b>61393.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.19		B	Clayey Soil (Twin D Type Well )					
			<i>Unit = Running Meter</i>					
			<i>Taking output = 1 meter</i>					
		(i)	Depth below bed level upto 3.0 M					
			Rate of sinking @ 0.16 m/hour					
			a) Labour					
			Mate	day	0.26	300.00	78.00	L-12
			Sinker ( skilled )	day	2.50	400.00	1000.00	L-15
			Sinking helper (semi-skilled)	day	4.00	300.00	1200.00	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.25	726.00	4537.50	P&M-075
			Consumables in sinking @ 10 per cent of (b)				453.75	
			c) Overhead charges @ 20 % on (a+b)				1453.85	
			d) Contractor's profit @ 10 % on (a+b+c)				872.31	
			Rate per metre = (a+b+c+d)				9595.41	
						say	<u>9595.00</u>	
12.19 B		(ii)	Beyond 3m upto 10m depth					
			Rate of sinking @ 0.15 m/hour					
			a) Labour					
			Mate	day	0.45	300.00	135.00	L-12
			Sinker	day	3.25	400.00	1300.00	L-15
			Sinking helper (semi-skilled)	day	6.00	300.00	1800.00	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.67	726.00	4842.42	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.50	569.00	2560.50	P&M-063
			Consumables in sinking @ 10 per cent of (b)				740.29	
			c) Overhead charges @ 20 % on (a+b)				2275.64	
			d) Contractor's profit @ 10 % on (a+b+c)				1365.39	
			Rate per metre = (a+b+c+d)				15019.24	
						say	<u>15019.00</u>	
12.19 B		(iii)	Beyond 10 m upto 20 m					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.					
							Including for dewatering @ 5% of cost, if required	
			11th m	5%	15770.00	16559.00		
			12th m	5%	16559.00	17387.00		
			13th m	5%	17387.00	18256.00		
			14th m	5%	18256.00	19169.00		
			15th m	5%	19169.00	20127.00		
			16th m	5%	20127.00	21133.00		
			17th m	5%	21133.00	22190.00		
			18th m	5%	22190.00	23300.00		
			19th m	5%	23300.00	24465.00		
			20th m	5%	24465.00	25688.00		
			Total Cost from 10m upto 20m		198356.00	208274.00		
			<i>Avg Rate per metre</i>			<u>19836.00</u>	<u>20827.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.19 B		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).			Including 25% for Kentledge	Including 5% for dewatering, if required	
			31st m	7.5%	26300.00	32875.00	34519.00	
			32nd	7.5%	28273.00	35341.00	37108.00	
			33rd m	7.5%	30393.00	37991.00	39891.00	
			34th m	7.5%	32672.00	40840.00	42882.00	
			35th m	7.5%	35122.00	43903.00	46098.00	
			36th m	7.5%	37756.00	47195.00	49555.00	
			37th m	7.5%	40588.00	50735.00	53272.00	
			38th m	7.5%	43632.00	54540.00	57267.00	
			39th m	7.5%	46904.00	58630.00	61562.00	
			40th m	7.5%	50422.00	63028.00	66179.00	
			Total Cost from 30m upto 40m		372062.00	465078.00	488333.00	
			<b>Avg Rate per metre</b>		<b>37206.00</b>	<b>46508.00</b>	<b>48833.00</b>	
12.19 B		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).			Including 20% for Kentledge	Including 5% for dewatering, if required	
			31st m	10%	55464.00	66557.00	69885.00	
			32nd	10%	61010.00	73212.00	76873.00	
			33rd m	10%	67111.00	80533.00	84560.00	
			34th m	10%	73822.00	88586.00	93015.00	
			35th m	10%	81204.00	97445.00	102317.00	
			36th m	10%	89324.00	107189.00	112548.00	
			37th m	10%	98256.00	117907.00	123802.00	
			38th m	10%	108082.00	129698.00	136183.00	
			39th m	10%	118890.00	142668.00	149801.00	
			40th m	10%	130779.00	156935.00	164782.00	
			Total Cost from 30m upto 40m		883942.00	1060730.00	1113766.00	
			<b>Avg Rate per metre</b>		<b>88394.00</b>	<b>106073.00</b>	<b>111377.00</b>	
12.19		C	<b>Soft Rock (Twin D Type Well )</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in soft rock strata upto 3m</b>					
			Rate of sinking @ 0.12 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.86	300.00	258.00	L-12
			Sinker ( skilled )	day	4.50	400.00	1800.00	L-15
			Sinking helper (semi-skilled)	day	15.00	300.00	4500.00	L-14
			Diver	day	1.50	700.00	1050.00	L-07

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.33	726.00	6047.58	P&M-075
		Air compressor with pneumatic breakers	hour	6.00	569.00	3414.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				946.16	
		Add for dewatering @ 5 per cent, if required				520.39	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				3707.22	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2224.33	
		<b>Rate per metre = (a+b+c+d)</b>				24467.68	
						<b>say</b> <b>24468.00</b>	
12.19	D	<b>Hard Rock (Twin D Type Well)</b>					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 1 m</i>					
		<b>Depth in hard rock strata upto 3 m</b>					
		Rate of sinking @ 0.10 m/hour					
		<b>a) Material</b>					
		Geletine80 per cent	Kg	10.00	148.00	1480.00	M-104
		Electric detonators	each.	40.00	9.90	396.00	M-094/100
		<b>b) Labour</b>					
		Mate	day	1.34	300.00	402.00	L-12
		Driller	day	2.00	300.00	600.00	L-06
		Blaster	day	0.25	300.00	75.00	L-03
		Mazdoor	day	25.00	250.00	6250.00	L-13
		Mazdoor (Skilled)	day	4.25	400.00	1700.00	L-15
		<b>c) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	10.00	726.00	7260.00	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	3.00	569.00	1707.00	P&M-063
		Dewatering @ 5 per cent of cost of (b+c), if required.				899.70	
		Consumables in sinking @ 10 per cent of (b).				986.67	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				4351.27	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				2610.76	
		<b>Rate per metre = (a+b+c+d+e)</b>				28718.41	
						<b>say</b> <b>28718.00</b>	
12.20	1200	<b>Pneumatic sinking of wells with equipment of approved design, drawing and specifications worked by competent and trained personnel and comprising of compression and decompression chambers, reducers, two air locks separately for men and plant &amp; materials, arrangement for supply of fresh air to working chambers, check valves, exhaust valves, shafts made from steel plates of riveted construction not less than 6 mm thick to withstand an air pressure of 0.50 MPa, controlled blasting of hard rock where required, staircases and 1 m wide landing platforms with railing, arrangement for compression and decompression, electric lighting of 50 V maximum, proper rooms for rest and medical examinations and compliance with safety precautions as per IS:4138, all as per clause1207.6 of MoRTH Specifications.</b>					
		<i>Unit - 1 cum</i>					
		<i>Taking output = 5 cum</i>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>a) Material</b>					
		M35 grade RCC corbel provided for supporting of equipment (Dimensions as per ground conditions). Rate may be adopted vide Item 12.8 (H)	Cum	8.00	7709.00	61672.00	Item 12.8 (H)
		HYSD bar reinforcement in corbel	tonne	0.48	53650.00	25752.00	M-082
		<b>Blasting material</b>					
		Gelatine 80 per cent	Kg	1.50	148.00	222.00	M-104
		Electric detonators	each	6.00	9.90	59.40	M-094/100
		<b>b) Labour</b>					
		Medical Officer	day	0.50	1200.00	600.00	L-16
		Para medical personnel	day	1.00	700.00	700.00	L-19
		Mate	day	1.86	300.00	558.00	L-12
		Driller	day	1.00	300.00	300.00	L-06
		Blaster	day	0.50	300.00	150.00	L-03
		Mazdoor (for cutting, blasting, cleaning, removal of Material etc.)	day	30.00	250.00	7500.00	L-13
		Mazdoor (Skilled) (for fixation and removal of adopter for air lock, carrying out mechanical and electrical operations and repairs and other skilled jobs.)	day	10.00	400.00	4000.00	L-15
		Diver	day	4.00	700.00	2800.00	L-07
		<b>c) Machinery</b>					
		<b>(i) Induction, deinduction and erection of plant and equipment including all components and accessories for pneumatic method of well sinking.</b>	hour	6.00	input	#VALUE!	P&M-082
		Induction and deinduction	L.S			100000.00	
		Erection at site and commissioning	L.S			150000.00	
		Usage of plant and equipment for pneumatic method of well sinking	hour	6.00	4557.00	27342.00	P&M-038
		Air compressor 250 cfm, 2 nos.	hour	2 x 6	516.00	6192.00	P&M-001
		Hire and running charges of crane of 15 tonne capacity	hour	6.00	726.00	4356.00	P&M-072
		Motorised barge of 20 tonne capacity	hour	6.00	1815.00	10890.00	P&M-066
		Boat to carry atleast 20 persons	hour	6.00	1815.00	10890.00	P&M-066
		Electric generating set 33 KVA	hour	6.00	407.00	2442.00	P&M-079
		Tipper 10 tonne capacity	hour	6.00	609.00	3654.00	P&M-048
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				#VALUE!	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				#VALUE!	
		Cost for 5 cum = a+b+c+d+e (see notes below)					
		<b>Rate per cum = (a+b+c+d+e)/5</b>					
	<b>Note</b>	1.The cost of induction, deinduction and erection of equipment shall be divided by the total quantity of pneumatic sinking for all the wells of a particular bridge to arrive at the per cum rate on account of this item.					
		2.Cost of pneumatic sinking per cum of individual wells will be added to the cost indicated at (1) above to arrive at the final rate of pneumatic sinking per cum.					
		3.The cost of induction and deinduction will depend upon the distance involved for shifting of equipment which may be assessed in individual cases as per actual ground conditions at the time of making of cost estimates.					
		4.In case pneumatic sinking is involved on a dry bed, the provision of barge and boat may be omitted.					
		5.The necessity and dimensions of the corbel will be as per actual ground conditions.					
		6.Small equipments like welding sets, pumps, vibrators, pneumatic tools, portable lamps, fire extinguishers, hose pipes etc., have not been included as the same are covered as items of minor T&P under overhead charges.					
		7.Depth of sinking shall be restricted to 30 m.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.21	1207	Sand Filling in Wells complete as per Drawing and Technical Specifications.					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Sand (assuming 20 per cent voids)	cum	1.20	540.00	648.00	M-006
		b) Labour					
		Mate	day	0.01	300.00	3.00	L-12
		Mazdoor	day	0.30	250.00	75.00	L-13
		c) Overhead charges @ 20 % on (a+b)				145.20	
		d) Contractor's profit @ 10 % on (a+b+c)				87.12	
		Rate per cum (a+b+c+d)				958.32	
						<i>say</i>	<u>958.00</u>
12.22	1200 & 1900	Providing Steel Liner 10 mm thick for Curbs and 6 mm thick for Steining of Wells including Fabricating and Setting out as per Detailed Drawing.					
		<i>Unit = 1 MT</i>					
		<i>Taking output = 1 MT</i>					
		a) Material					
		i) Structural steel including 5 per cent wastage	tonne	1.05	57210.00	60070.50	M-179
		b) Labour					
		Mate	day	1.24	300.00	372.00	L-12
		Fitter	day	6.00	400.00	2400.00	L-08
		Blacksmith	day	5.00	300.00	1500.00	L-01
		Welder	day	5.00	400.00	2000.00	L-02
		Mazdoor	day	10.00	250.00	2500.00	L-13
		Electrodes, cutting gas and other consumables @ 5 per cent on cost a (a) above.				3003.53	
		c) Overhead charges @ 20 % on (a+b)				14369.21	
		d) Contractor's profit @ 10 % on (a+b+c)				8621.52	
		Rate for per MT (a+b+c+d)				94836.75	
						<i>say</i>	<u>94837.00</u>
12.23	1100 & 1700	Bored cast-in-situ M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and Technical Specifications and removal of excavated earth with all lifts and lead upto 1000 m.					
		Pile diameter-750 mm					
		<i>Unit = meter</i>					
		<i>Taking output = 15 m</i>					
		a) Materials					
		PCC Grade M35	cum	6.62	7782.00	51516.84	Item 12.11 (C) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11 (C) (IV)					
		Concrete to be cast with a tremie pipe 200mm dia.					
		b) Machinery( for boring and construction )					
		Hire and running charges of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.	hour	6.00	5972.00	35832.00	P&M-036
		Hire and running charges of light crane for lowering reinforcement cage	hour	0.50	389.00	194.50	P&M-013
		Hire and running charges of Bentonite pump	hour	6.00	Rate included in piling rig		
		Loader 1 cum bucket capacity.	hour	0.30	1253.00	375.90	P&M-017
		Tipper 5.5 cum capacity for disposal of muck from pile bore hole	hour	0.30	609.00	182.70	P&M-048
		Bentonite	kg	300.00	2.45	735.00	M-071

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Labour</b>					
		Mate/Supervisor	day	0.14	300.00	42.00	L-12
		Mazdoor	day	3.50	250.00	875.00	L-13
		<b>d) Overhead charges @ 20 % on (b+c)</b>				7647.42	
		<b>e) Contractor's profit @ 10 % on (b+c+d)</b>				4588.45	
		Cost for 15 m = a+b+c+d+e				101989.81	
		<b>Rate per metre (a+b+c+d+e)/15</b>				6799.32	
					<b>say</b>	<b><u>6799.00</u></b>	
12.24	1100,1600 & 1700	Bored cast-in-situ M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and Technical Specifications and removal of excavated earth with all lifts and lead upto 1000 m. Pile diameter-1000 mm <i>Unit = meter</i> <i>Taking output = 10 m</i>					
		<b>a) Materials</b>					
		PCC Grade M35	cum	7.85	7782.00	61088.70	Item 12.11 (C) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11 (C) (IV)					
		Concrete to be cast with a tremie pipe 200mm dia.					
		<b>b) Machinery( for boring and construction )</b>					
		Hire and running charges of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.	hour	6.00	5972.00	35832.00	P&M-036
		Hire and running charges of light crane for lowering reinforcement cage	hour	0.50	389.00	194.50	P&M-013
		Hire and running charges of Bentonite pump	hour	6.00	Rate included in piling rig		
		Loader 1 cum bucket capacity.	hour	0.40	1253.00	501.20	P&M-017
		Tipper 5.5 cum capacity for disposal of muck from pile bore hole	hour	0.40	609.00	243.60	P&M-048
		Bentonite	kg	350.00	2.45	857.50	M-071
		<b>c) Labour</b>					
		Mate/Supervisor	day	0.16	300.00	48.00	L-12
		Mazdoor	day	4.00	250.00	1000.00	L-13
		<b>d) Overhead charges @ 20 % on (b+c)</b>				7735.36	
		<b>e) Contractor's profit @ 10 % on (b+c+d)</b>				4641.22	
		Cost for 10 m = a+b+c+d+e				112142.08	
		<b>Rate per metre (a+b+c+d+e)/10</b>				11214.21	
					<b>say</b>	<b><u>11214.00</u></b>	
12.25	1100 & 1700	Bored cast-in-situ M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and Technical Specifications and removal of excavated earth with all lifts and lead upto 1000 m. Pile diameter-1200 mm <i>Unit = meter</i> <i>Taking output = 9 m</i>					
		<b>a) Materials</b>					
		PCC Grade M35	cum	10.17	7782.00	79142.94	Item 12.11 (C) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11 (C) (IV)					
		Concrete to be cast with a tremie pipe 200mm dia.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery( for boring and construction )</b>					
		Hire and running charges of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.	hour	6.00	5972.00	35832.00	P&M-036
		Hire and running charges of light crane for lowering reinforcement cage	hour	0.50	389.00	194.50	P&M-013
		Hire and running charges of Bentonite pump	hour	6.00	Rate included in piling rig		
		Loader 1 cum bucket capacity.	hour	0.50	1253.00	626.50	P&M-017
		Tipper 5.5 cum capacity for disposal of muck from pile bore hole	hour	0.50	609.00	304.50	P&M-048
		Bentonite	kg	385.00	2.45	943.25	M-071
		<b>c) Labour</b>					
		Mate/Supervisor	day	0.18	300.00	54.00	L-12
		Mazdoor	day	4.50	250.00	1125.00	L-13
		<b>d) Overhead charges @ 20 % on (b+c)</b>				7815.95	
		<b>e) Contractor's profit @ 10 % on (b+c+d)</b>				4689.57	
		Cost for 9 m = a+b+c+d+d+e				130728.21	
		<b>Rate per metre (a+b+c+d+e)/9</b>				14525.36	
					<b>say</b>	<b>14525.00</b>	
12.26	1100 & 1700	<b>Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and &amp; Technical Specification</b>					
		<b>Pile diameter - 750 mm</b>					
		<b>Unit = Running meter</b>					
		<b>Taking output = 40 metre</b>					
		<b>a) Materials</b>					
		PCC Grade M35	cum	17.66	7782.00	137430.12	Item 12.11 (C) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( C ) (IV)					
		<b>b) Materials Pile shoes</b>					
		i) C.I. shoes for the pile	Kg	160.00	55.00	8800.00	M-080
		ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.00	220.00	15400.00	M-124
		iii) Steel helmet and cushion block on top of casing head during driving	Kg	50.00	181.00	9050.00	M-173
		<b>c) Machinery</b>					
		Hire and running charges of piling rig Including double acting pile driving hammer complete with power unit and accessories..	hour	6.00	5972.00	35832.00	P&M-085
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.50	666.00	333.00	P&M-070
		<b>d) Labour</b>					
		Mate/Supervisor	day	0.12	300.00	36.00	L-12
		Mazdoor	day	3.00	250.00	750.00	L-13
		<b>e) Overhead charges @ 20 % on (b+c+d)</b>				14040.20	
		<b>f) Contractor's profit @ 10 % on (b+c+d+e)</b>				8424.12	
		Cost for 40 m = a+b+c+d+e				230095.44	
		<b>Rate per metre (a+b+c+d+e)/40</b>				5752.39	
					<b>say</b>	<b>5752.00</b>	
		<b>Note</b>					
		1.The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		2.In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 per cent of cost of concrete may be provided to cover its usage.					
12.27	1100 & 1700	<b>Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and &amp; Technical Specification</b>					
		Pile diameter - 1000 mm					
		<i>Unit = Running meter</i>					
		<i>Taking output = 30 metre</i>					
		<b>a) Materials</b>					
		PCC Grade M35	cum	23.55	7782.00	183266.10	Item 12.11 (C) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( C ) (IV)					
		<b>b) Materials Pile shoes</b>					
		i) C.I. shoes for the pile	Kg	160.00	55.00	8800.00	M-080
		ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.00	220.00	15400.00	M-124
		iii) Steel helmet and cushion block on top of casing head during driving	Kg	50.00	181.00	9050.00	M-173
		<b>c) Machinery</b>					
		Hire and running charges of piling rig Including double acting pile driving hammer complete with power unit and accessories.	hour	6.00	5972.00	35832.00	P&M-085
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.50	666.00	333.00	P&M-070
		Hire and running charges for light crane for lowering reinforcement cage.	hour	0.50	389.00	194.50	P&M-013
		<b>d) Labour</b>					
		Mate/Supervisor	day	0.16	300.00	48.00	L-12
		Mazdoor	day	4.00	250.00	1000.00	L-13
		<b>e) Overhead charges @ 20 % on (b+c+d)</b>				14131.50	
		<b>f) Contractor's profit @ 10 % on (b+c+d+e)</b>				8478.90	
		Cost for 30 m = a+b+c+d+e				276534.00	
		<b>Rate per metre (a+b+c+d+e)/30</b>				9217.80	
					<b>say</b>	<b>9218.00</b>	
		<b>Note</b>					
		1.The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
		2.In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 per cent of cost of concrete may be provided to cover its usage.					
12.28	1100 & 1700	<b>Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and &amp; Technical Specification</b>					
		Pile diameter - 1200 mm					
		<i>Unit = Running meter</i>					
		<i>Taking output = 20 metre</i>					
		<b>a) Materials</b>					
		PCC Grade M35	cum	22.61	7782.00	175951.02	Item 12.11 (C) iv

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( C ) (IV)					
		<b>b) Materials Pile shoes</b>					
		i) C.I. shoes for the pile	Kg	160.00	55.00	8800.00	M-080
		ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.00	220.00	15400.00	M-124
		iii) Steel helmet on top of casing head during driving	Kg	50.00	181.00	9050.00	M-173
		<b>c) Machinery</b>					
		Hire and running charges of piling rig including double acting pile driving hammer complete with power unit and accessories.	hour	6.00	5972.00	35832.00	P&M-085
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.50	666.00	333.00	P&M-070
		<b>d) Labour</b>					
		Mate/Supervisor	day	0.18	300.00	54.00	L-12
		Mazdoor	day	4.50	250.00	1125.00	L-13
		<b>e) Overhead charges @ 20 % on (b+c+d)</b>				14118.80	
		<b>f) Contractor's profit @ 10 % on (b+c+d+e)</b>				8471.28	
		Cost for 20 m = a+b+c+d+e				269135.10	
		<b>Rate per metre (a+b+c+d+e)/20</b>				13456.76	
					<i>say</i>	<b>13457.00</b>	
		<b>Note</b>					
		1.The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
		2.In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 per cent of cost of concrete may be provided to cover its usage.					
12.37	1100	<b>Pile Load Test on single Vertical Pile in accordance with IS:2911(Part-IV)</b>					
		<b>Unit = 1 MT</b>					
		<b>Taking output = 1 MT</b>					
		a) Initial and routine load test	tonne	1.00	300.00		
		b) Lateral load test	tonne	1.00	5000.00		
		<b>Note</b>					
		Although, this item is incidental to work and is not required to be included in BOQ of contract, the same is required to be added in the estimate to assess cost of work.					
12.38	1100, 1500 & 1700	<b>Cement Concrete for Reinforced Concrete in Pile Cap complete as per Drawing and Technical Specification</b>					
		<b>A</b>					
		<b>RCC Grade M20</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>(i) Using Concrete Mixer</b>					
		<b>a) Material</b>					
		Cement	tonne	5.12	8120.00	41574.40	M-081
		Coarse sand	cum	6.75	540.00	3645.00	M-005
		20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
		10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
		<b>b) Labour</b>					
		Mate	day	0.90	300.00	270.00	L-12
		Mason	day	1.50	300.00	450.00	L-10
		Mazdoor for concreting	day	20.00	250.00	5000.00	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	250.00	250.00	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		<b>c) Machinery</b>						
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009	
		Generator (capacity 33 KVA)	hour	6.00	407.00	2442.00	P&M-079	
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				3099.74		
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				16118.63		
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				9671.18		
		Cost for 15 cum = a+b+c+d+e				106382.94		
		<b>Rate per metre (a+b+c+d+e)/15</b>				7092.20		
					<b>say</b>	<b><u>7092.00</u></b>		
12.38A	(ii)	<b>Using Batching Plant, Transit Mixer and Concrete Pump</b>						
		<b>a) Material</b>						
		Cement	tonne	5.12	8120.00	41574.40	M-081	
		Coarse sand	cum	6.75	540.00	3645.00	M-004	
		20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053	
		10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051	
		<b>b) Labour</b>						
		Mate	day	0.16	300.00	48.00	L-12	
		Mason	day	0.38	300.00	114.00	L-10	
		Mazdoor for concreting	day	2.50	250.00	625.00	L-13	
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	250.00	250.00	L-13	
		<b>c) Machinery</b>						
		Batching Plant @ 20 cum/hour	hour	0.75	2440.00	1830.00	P&M-002	
		Generator 100 KVA	hour	0.75	762.00	571.50	P&M-080	
		Loader (capacity 1 cum)	hour	0.75	1253.00	939.75	P&M-017	
		Transit Mixer ( capacity 4.0 cu.m )						
		Lead upto 1 Km	hour	2.00	1016.00	2032.00	P&M-049	
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	0.00	0.00	Lead =0 km & P&M-050	
		Concrete Pump	hour	0.75	279.00	209.25	P&M-007	
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				2969.96		
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				15443.77		
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				9266.26		
		Cost for 15 cum = a+b+c+d+e				101928.89		
		<b>Rate per metre (a+b+c+d+e)/15</b>				6795.26		
					<b>say</b>	<b><u>6795.00</u></b>		
		<b>Note</b>	The value of a, b and c may be taken as applicable i.e. either using concrete mixer or batching plant.					
12.38	B	<b>RCC Grade M25</b>						
		<b>Unit = cum</b>						
		<b>Taking output = 15 cum</b>						
	(i)	<b>Using Concrete Mixer</b>						
		<b>a) Material</b>						
		Cement	tonne	5.99	8120.00	48638.80	M-081	
		Coarse sand	cum	6.75	540.00	3645.00	M-005	
		20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053	
		10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051	
		<b>b) Labour</b>						
		Mate	day	0.90	300.00	270.00	L-12	
		Mason	day	1.50	300.00	450.00	L-10	
		Mazdoor for concreting	day	20.00	250.00	5000.00	L-13	
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	250.00	250.00	L-13	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		<b>c) Machinery</b>						
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009	
		Generator (capacity 33 KVA)	hour	6.00	407.00	2442.00	P&M-079	
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				3382.31		
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				17588.02		
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				10552.81		
		Cost for 15 cum = a+b+c+d+e				116080.95		
		<b>Rate per metre (a+b+c+d+e)/15</b>				7738.73		
					<b>say</b>	<b>7739.00</b>		
12.38B	(ii)	<b>Using Batching Plant, Transit Mixer and Concrete Pump</b>						
		<b>a) Material</b>						
		Cement	tonne	5.99	8120.00	48638.80	M-081	
		Coarse sand	cum	6.75	540.00	3645.00	M-004	
		20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053	
		10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051	
		<b>b) Labour</b>						
		Mate	day	0.16	300.00	48.00	L-12	
		Mason	day	0.38	300.00	114.00	L-10	
		Mazdoor for concreting	day	2.50	250.00	625.00	L-13	
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	250.00	250.00	L-13	
		<b>c) Machinery</b>						
		Batching Plant @ 20 cum/hour	hour	0.75	2440.00	1830.00	P&M-002	
		Generator 125 KVA	hour	0.75	787.00	590.25	P&M-018	
		Loader (capacity 1 cum)	hour	0.75	1253.00	939.75	P&M-017	
		Transit Mixer ( capacity 4.0 cu.m )						
		Lead upto 1 Km	hour	2.00	1016.00	2032.00	P&M-049	
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	0.00	0.00	Lead =0 km & P&M-050	
		Concrete Pump	hour	0.75	279.00	209.25	P&M-007	
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				3253.28		
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				16917.07		
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				10150.24		
		Cost for 15 cum = a+b+c+d+e				111652.64		
		<b>Rate per metre (a+b+c+d+e)/15</b>				7443.51		
					<b>say</b>	<b>7444.00</b>		
		<b>Note</b>	The value of a, b and c may be taken as applicable i.e. either using concrete mixer or batching plant.					
12.38	C	<b>RCC Grade M30</b>						
		<b>Unit = cum</b>						
		<b>Taking output = 15 cum</b>						
	(i)	<b>Using Concrete Mixer</b>						
		<b>a) Material</b>						
		Cement	tonne	6.10	8120.00	49532.00	M-081	
		Coarse sand	cum	6.75	540.00	3645.00	M-005	
		20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053	
		10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051	
		<b>b) Labour</b>						
		Mate	day	0.90	300.00	270.00	L-12	
		Mason	day	1.50	300.00	450.00	L-10	
		Mazdoor for concreting	day	20.00	250.00	5000.00	L-13	
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	250.00	250.00	L-13	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		<b>c) Machinery</b>						
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009	
		Generator (capacity 33 KVA)	hour	6.00	407.00	2442.00	P&M-079	
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				3418.04		
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				17773.81		
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				10664.28		
		Cost for 15 cum = a+b+c+d+e				117307.13		
		<b>Rate per metre (a+b+c+d+e)/15</b>				7820.48		
					<b>say</b>	<b>7820.00</b>		
'12.38C	(ii)	<b>Using Batching Plant, Transit Mixer and Concrete Pump</b>						
		<b>a) Material</b>						
		Cement	tonne	6.10	8120.00	49532.00	M-081	
		Coarse sand	cum	6.75	540.00	3645.00	M-004	
		20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053	
		10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051	
		<b>b) Labour</b>						
		Mate	day	0.16	300.00	48.00	L-12	
		Mason	day	0.38	300.00	114.00	L-10	
		Mazdoor for concreting	day	2.50	250.00	625.00	L-13	
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	250.00	250.00	L-13	
		<b>c) Machinery</b>						
		Batching Plant @ 20 cum/hour	hour	0.75	2440.00	1830.00	P&M-002	
		Generator 100 KVA	hour	0.75	762.00	571.50	P&M-080	
		Loader (capacity 1 cum)	hour	0.75	1253.00	939.75	P&M-017	
		Transit Mixer ( capacity 4.0 cu.m )						
		Lead upto 1 Km	hour	2.00	1016.00	2032.00	P&M-049	
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	0.00	0.00	Lead =0 km & P&M-050	
		Concrete Pump	hour	0.75	279.00	209.25	P&M-007	
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				3288.26		
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				17098.95		
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				10259.37		
		Cost for 15 cum = a+b+c+d+e				112853.08		
		<b>Rate per metre (a+b+c+d+e)/15</b>				7523.54		
					<b>say</b>	<b>7524.00</b>		
		<b>Note</b>	The value of a, b and c may be taken as applicable i.e. either using concrete mixer or batching plant.					
12.38	D	<b>RCC Grade M35</b>						
		<b>Unit = cum</b>						
		<b>Taking output = 15 cum</b>						
	(i)	<b>Using Concrete Mixer</b>						
		<b>a) Material</b>						
		Cement	tonne	6.33	8120.00	51399.60	M-081	
		Coarse sand	cum	6.75	540.00	3645.00	M-005	
		20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053	
		10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051	
		<b>b) Labour</b>						
		Mate	day	0.90	300.00	270.00	L-12	
		Mason	day	1.50	300.00	450.00	L-10	
		Mazdoor	day	20.00	250.00	5000.00	L-13	
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	250.00	250.00	L-13	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
		Generator (capacity 33 KVA)	hour	6.00	407.00	2442.00	P&M-079
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				3492.74	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				18162.27	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				10897.36	
		Cost for 15 cum = a+b+c+d+e				119870.97	
		<b>Rate per metre (a+b+c+d+e)/15</b>				7991.40	
					<b>say</b>	<b>7991.00</b>	
'12.38D	(ii)	<b>Using Batching Plant, Transit Mixer and Concrete Pump</b>					
		<b>a) Material</b>					
		Cement	tonne	6.33	8120.00	51399.60	M-081
		Coarse sand	cum	6.75	540.00	3645.00	M-004
		20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
		10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
		<b>b) Labour</b>					
		Mate	day	0.16	300.00	48.00	L-12
		Mason	day	0.38	300.00	114.00	L-10
		Mazdoor for concreting	day	2.50	250.00	625.00	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	250.00	250.00	L-13
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	0.75	2440.00	1830.00	P&M-002
		Generator 125 KVA	hour	0.75	787.00	590.25	P&M-018
		Loader (capacity 1 cum)	hour	0.75	1253.00	939.75	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Lead upto 1 Km	hour	2.00	1016.00	2032.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	0.00	0.00	Lead =0 km & P&M-050
		Concrete Pump	hour	0.75	279.00	209.25	P&M-007
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				3363.71	
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				17491.31	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				10494.79	
		Cost for 15 cum = a+b+c+d+e				115442.66	
		<b>Rate per metre (a+b+c+d+e)/15</b>				7696.18	
					<b>say</b>	<b>7696.00</b>	
12.39	1100&1700	Levelling Course for Pile cap					
		Providing and laying of PCC M15 levelling course 100mm thick below the pile cap.					
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	4.13	8120.00	33535.60	M-081
		Coarse sand	cum	6.75	540.00	3645.00	M-005
		40 mm aggregate	cum	8.10	1250.00	10125.00	M-055
		20 mm Aggregate	cum	4.05	1600.00	6480.00	M-053
		10 mm Aggregate	cum	1.35	1750.00	2362.50	M-051
		<b>b) Labour</b>					
		Mate	day	0.86	300.00	258.00	L-12
		Mason	day	1.50	300.00	450.00	L-10
		Mazdoor	day	20.00	250.00	5000.00	L-13

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
		Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				13150.02	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				7890.01	
		Cost for 15 cum = a+b+c+d+e				86790.13	
		Rate per metre (a+b+c+d+e)/15				5786.01	
					<b>say</b>	<b>5786.00</b>	
12.40	1600	Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications.					
		<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	53650.00	56332.50	M-082
		Binding wire	Kg	6.00	80.00	480.00	M-072
		<b>b) Labour for cutting, bending, shifting to site, tying and placing in position</b>					
		Mate	day	0.40	300.00	120.00	L-12
		Blacksmith	day	2.00	400.00	800.00	L-02
		Mazdoor	day	6.00	250.00	1500.00	L-13
						11846.50	
						7107.90	
						78186.90	
					<b>say</b>	<b>78187.00</b>	
12.41	1600	Supplying, fitting and placing un-coated Mild steel reinforcement complete in foundation as per drawing and technical specification					
		<b>Unit = 1 MT</b>					
		<b>Taking output = 1 MT</b>					
		<b>a) Material</b>					
		MS bars including 5 per cent overlaps and wastage	tonne	1.05	53650.00	56332.50	M-126
		Binding wire	Kg	6.00	80.00	480.00	M-072
		<b>b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position</b>					
		Mate	day	0.43	300.00	129.00	L-12
		Blacksmith	day	2.25	400.00	900.00	L-02
		Mazdoor	day	6.50	250.00	1625.00	L-13
		<b>c) Overhead charges @ 20 % on (a+b)</b>				11893.30	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				7135.98	
		Rate for per MT (a+b+c+d)				78495.78	
					<b>say</b>	<b>78496.00</b>	

## Chapter – 13

### SUBSTRUCTURE

#### Preamble:

- 1 Although, substructure are generally constructed in cement concrete, the rate for brick and stone masonry in CM 1:3 have also been included which can be adopted permitted by design.
- 2 The cost of formwork will vary with the height and cross-section of the substructure. Provision has been made accordingly.
- 3 Bridge bearing, being commercial item produced by specialised firms with imported technology and parts, the rates for the same are ascertained by quotation from the market for the approved design and technical specifications.
- 4 Filter media and backfilling behind abutment are required to be provided as per guidelines in IRC:78- 2000.
- 5 Weep holes shall be provided as per specifications.
- 6 In case of roller-cum-rocker bearings, only full circular rollers are to be provided.
- 7 Bearing shall be set truly level so as to have full and even seating.
- 8 For elastomeric bearings, the concrete surface shall be leveled such that the variation is not more than 1.5 mm from a straight edge placed in any direction across the area.
- 9 The bearing should be procured only from those manufacturers who have been prequalified by the Ministry of Road Transport and Highways.
- 10 The bottoms of girders resting on the bearing shall be plane and truly horizontal.
- 11 For spans in garde, the bearing shall be placed horizontal by using sole plates for suitbly designed RCC pedestals.

**CHAPTER-13**  
**SUB-STRUCTURE**

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.1	1300 & 2200	Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and Technical Specifications					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Bricks 1st class	each	500.00	9.00	4500.00	M-079
		Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	0.24	4945.00	1186.80	Item 12.6 (A)
		b) Labour					
		Mate	day	0.06	300.00	18.00	L-12
		Mason	day	0.80	400.00	320.00	L-11
		Mazdoor	day	0.80	250.00	200.00	L-13
		Add for scaffolding @ 5 per cent of cost of material and labour				311.24	
		c) Overhead charges @ 20 % on (a+b)				1307.21	
		d) Contractor's profit @ 10 % on (a+b+c)				784.32	
		Rate per cum (a+b+c+d)				8627.57	
					<b>say</b>	<b>8628.00</b>	
13.2	1300 & 2200	Pointing with cement mortar (1:3 ) on brick work in substructure as per Technical Specifications					
		<i>Unit = 10 sqm</i>					
		<i>Taking output = 10 sqm</i>					
		a) Material					
		Cement mortar 1:3 (Rate as in Item 12.6 )	cum	0.03	4945.00	148.35	Item 12.6
		b) Labour					
		Mate	day	0.04	300.00	12.00	L-12
		Mason	day	0.50	400.00	200.00	L-11
		Mazdoor	day	0.50	250.00	125.00	L-13
		c) Overhead charges @ 20 % on (a+b)				97.07	
		d) Contractor's profit @ 10 % on (a+b+c)				58.24	
		Rate per 10 sqm (a+b+c+d)				640.66	
					<b>say</b>	<b>64.10</b>	
	Note	Scaffolding is already included in item 13.1					
13.3	1300 & 2200	Plastering with cement mortar (1:3 ) on brick work in sub-structure as per Technical Specifications					
		<i>Unit = 10 sqm</i>					
		<i>Taking output = 10 sqm</i>					
		a) Material					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.144	4945.00	712.08	Item 12.6 (A)
		b) Labour					
		Mate	day	0.04	300.00	12.00	L-12
		Mason	day	0.50	400.00	200.00	L-11
		Mazdoor	day	0.50	250.00	125.00	L-13
		c) Overhead charges @ 20 % on (a+b)				209.82	
		d) Contractor's profit @ 10 % on (a+b+c)				125.89	
		Rate per 10 sqm (a+b+c+d)				1384.79	
					<b>say</b>	<b>138.50</b>	
	Note	1.Scaffolding is already included in item no. 13.1					
		2.The number of masons and Mazdoors already catered in the cement mortar have been taken into account while providing these categories in brick masonry, pointing and plastering.					
13.4	1400 & 2200	Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specifications					
	A	Random Rubble Masonry ( coursed/uncoursed )					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>a) Material</b>					
		Stone	cum	1.00	517.00	517.00	M-148
		Through and bond stone	No	7.00	13.00	91.00	M-182
		(7no.x0.24mx0.24mx0.39m = 0.16 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.33	4945.00	1631.85	Item 12.6 (A)
		<b>b) Labour</b>					
		Mate	day	0.10	300.00	30.00	L-12
		Mason	day	1.20	400.00	480.00	L-11
		Mazdoor	day	1.20	250.00	300.00	L-13
		Add for scaffolding @ 5 per cent of cost of a) Material and b) Labour				152.49	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				640.47	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				384.28	
		<b>Rate per cum (a+b+c+d)</b>				4227.09	
					say	<b>4227.00</b>	
13.4		<b>B Coursed rubble masonry (first sort )</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Material</b>					
		Stone	cum	1.10	517.00	568.70	M-148
		Through and bond stone	each	7.00	13.00	91.00	M-182
		(7no.x0.24mx0.24mx0.39m = 0.16 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.30	4945.00	1483.50	Item 12.6 (A)
		<b>b) Labour</b>					
		Mate	day	0.12	300.00	36.00	L-12
		Mason	day	1.50	400.00	600.00	L-11
		Mazdoor	day	1.50	250.00	375.00	L-13
		Add for scaffolding @ 5 per cent of cost of material and labour				157.71	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				662.38	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				397.43	
		<b>Rate per cum (a+b+c+d)</b>				4371.72	
					say	<b>4372.00</b>	
13.4		<b>C Ashlar masonry ( first sort )</b>					
		<b>Plain ashlar</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Material</b>					
		Stone	cum	1.11	517.00	573.87	M-169
		Through and bond stone	each	7.00	13.00	91.00	M-182
		(7no.x0.24mx0.24mx0.39m = 0.16 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.33	4945.00	1631.85	Item 12.6 (A)
		<b>b) Labour for masonry work</b>					
		Mate	day	0.20	300.00	60.00	L-12
		Mason	day	2.50	400.00	1000.00	L-11
		Mazdoor	day	2.50	250.00	625.00	L-13
		Add for scaffolding @ 5 per cent of cost of a) Material and b) Labour				199.09	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				836.16	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				501.70	
		<b>Rate per cum (a+b+c+d)</b>				5518.66	
					say	<b>5519.00</b>	
	<b>Note</b>	The labour already considered in the cement mortar have been taken into account while providing these categories in the stone masonry works.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.5	1500, 1700 & 2200	Plain/Reinforced cement concrete in sub-structure complete as per drawing and Technical Specifications					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
	<b>A</b>	<b>PCC Grade M15</b>					
	<b>(p)</b>	<b>Height upto 5m</b>					
		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.					
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c) of Item 12.8 (A)</b>				4449.00	Item 12.8 (A)
		<b>d) formwork</b>					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		444.90	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				978.78	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				587.27	
		<b>Rate perm (a+b+c+d+e+f)</b>				6459.95	
					<b>say</b>	<b><u>6460.00</u></b>	
13.5		<b>B PCC Grade M20</b>					
	<b>(p)</b>	<b>Height upto 5m</b>					
		Same as Item 12.8 (B) upto 5 m height, except for formwork which shall be 10 per cent instead of 4 per cent of cost of material, labour and machinery.					
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c) of Item 12.8 (B)</b>				5028.00	Item 12.8 (B)
		<b>d) formwork</b>					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		502.80	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				1106.16	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				663.70	
		<b>Rate perm (a+b+c+d+e+f)</b>				7300.66	
					<b>say</b>	<b><u>7301.00</u></b>	
13.5		<b>C PCC Grade M25</b>					
	<b>(p)</b>	<b>Height upto 5m</b>					
		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.					
	<b>Case I</b>	<b>Using concrete Mixer</b>					
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c) of Item 12.8 (D) Case I</b>				5477.00	Item 12.8 (D)
		<b>d) formwork</b>					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		547.70	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				1204.94	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				722.96	
		<b>Rate perm (a+b+c+d+e+f)</b>				7952.60	
					<b>say</b>	<b><u>7953.00</u></b>	
13.5 C (p)	<b>Case II</b>	<b>With Batching Plant, Transit Mixer and Concrete Pump</b>					
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c) of Item 12.8 (D) Case II</b>				5242.00	Item 12.8 (D)
		<b>d) formwork</b>					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		524.20	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				1153.24	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				691.94	
		<b>Rate perm (a+b+c+d+e+f)</b>				7611.38	
					<b>say</b>	<b><u>7611.00</u></b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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				5477.00	Item 12.8 (D)
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		657.24	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		109.54	
		e) Overhead charges @ 20 % on (a+b+c+d)				1248.76	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				749.25	
		Rate perm (a+b+c+d+e+f)				8241.79	
					say	<u>8242.00</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				5242.00	
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		629.04	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		104.84	
		e) Overhead charges @ 20 % on (a+b+c+d)				1195.18	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				717.11	
		Rate perm (a+b+c+d+e+f)				7888.16	
					say	<u>7888.00</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				5477.00	Item 12.8 (D)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		821.55	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		219.08	
		e) Overhead charges @ 20 % on (a+b+c+d)				1303.53	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				782.12	
		Rate perm (a+b+c+d+e+f)				8603.27	
					say	<u>8603.00</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				5242.00	Item 12.8 (D)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		786.30	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		209.68	
		e) Overhead charges @ 20 % on (a+b+c+d)				1247.60	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				748.56	
		Rate perm (a+b+c+d+e+f)				8234.13	
					say	<u>8234.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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				5526.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		552.60	
		e) Overhead charges @ 20 % on (a+b+c+d)				1215.72	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				729.43	
		Rate perm (a+b+c+d+e+f)				8023.75	
							say <u>8024.00</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				5286.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		528.60	
		e) Overhead charges @ 20 % on (a+b+c+d)				1162.92	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				697.75	
		Rate perm (a+b+c+d+e+f)				7675.27	
							say <u>7675.00</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				5526.00	
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		663.12	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		110.52	
		e) Overhead charges @ 20 % on (a+b+c+d)				1259.93	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				755.96	
		Rate perm (a+b+c+d+e+f)				8315.52	
							say <u>8316.00</u>
13.5 D	(q)	Case II With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case II				5286.00	
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		634.32	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		105.72	
		e) Overhead charges @ 20 % on (a+b+c+d)				1205.21	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				723.12	
		Rate perm (a+b+c+d+e+f)				7954.37	
							say <u>7954.00</u>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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				5526.00	
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		828.90	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		221.04	
		e) Overhead charges @ 20 % on (a+b+c+d)				1315.19	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				789.11	
		Rate perm (a+b+c+d+e+f)				8680.24	
					say	<u>8680.00</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				5286.00	
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		792.90	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		211.44	
		e) Overhead charges @ 20 % on (a+b+c+d)				1258.07	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				754.84	
		Rate perm (a+b+c+d+e+f)				8303.25	
					say	<u>8303.00</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				5208.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		520.80	
		e) Overhead charges @ 20 % on (a+b+c+d)				1145.76	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				687.46	
		Rate perm (a+b+c+d+e+f)				7562.02	
					say	<u>7562.00</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				4970.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		497.00	
		e) Overhead charges @ 20 % on (a+b+c+d)				1093.40	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				656.04	
		Rate perm (a+b+c+d+e+f)				7216.44	
					say	<u>7216.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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				5208.00	
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		624.96	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		104.16	
		e) Overhead charges @ 20 % on (a+b+c+d)				1187.42	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				712.45	
		Rate perm (a+b+c+d+e+f)				7837.00	
						say	<u>7837.00</u>
13.5 E	(q)	With Batching Plant, Transit Mixer and Concrete Pump					
	Case II	Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case II				4970.00	
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		596.40	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		99.40	
		e) Overhead charges @ 20 % on (a+b+c+d)				1133.16	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				679.90	
		Rate perm (a+b+c+d+e+f)				7478.86	
						say	<u>7479.00</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				5208.00	
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		781.20	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		208.32	
		e) Overhead charges @ 20 % on (a+b+c+d)				1239.50	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				743.70	
		Rate perm (a+b+c+d+e+f)				8180.73	
						say	<u>8181.00</u>
13.5 E	(r)	With Batching Plant, Transit Mixer and Concrete Pump					
	Case II	Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case II				4970.00	
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		745.50	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		198.80	
		e) Overhead charges @ 20 % on (a+b+c+d)				1182.86	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				709.72	
		Rate perm (a+b+c+d+e+f)				7806.88	
						say	<u>7807.00</u>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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				5663.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		566.30	
		e) Overhead charges @ 20 % on (a+b+c+d)				1245.86	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				747.52	
		Rate perm (a+b+c+d+e+f)				8222.68	
							say <u>8223.00</u>
13.5 F	(p)	With Batching Plant, Transit Mixer and Concrete Pump					
	Case II	Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case II				5513.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		551.30	
		e) Overhead charges @ 20 % on (a+b+c+d)				1212.86	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				727.72	
		Rate perm (a+b+c+d+e+f)				8004.88	
							say <u>8005.00</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				5663.00	
		d) formwork					
		Add 11.8 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.80		668.23	
		Add 1.8 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.80		101.93	
		e) Overhead charges @ 20 % on (a+b+c+d)				1286.63	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				771.98	
		Rate perm (a+b+c+d+e+f)				8491.78	
							say <u>8492.00</u>
13.5 F	(q)	With Batching Plant, Transit Mixer and Concrete Pump					
	Case II	Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case II				5513.00	
		d) formwork					
		Add 11.8 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.80		650.53	
		Add 1.8 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.80		99.23	
		e) Overhead charges @ 20 % on (a+b+c+d)				1252.55	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				751.53	
		Rate perm (a+b+c+d+e+f)				8266.85	
							say <u>8267.00</u>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.5 F	(r)	<b>Height above 10m</b>					
		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					
	<b>Case I</b>	<b>Using concrete Mixer</b>					
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c) of Item 12.8 (E) Case I</b>				5663.00	
		<b>d) formwork</b>					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		849.45	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		226.52	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				1347.79	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				808.68	
		<b>Rate perm (a+b+c+d+e+f)</b>				8895.44	
							<b>say 8895.00</b>
13.5 F (r)	<b>Case II</b>	<b>With Batching Plant, Transit Mixer and Concrete Pump</b>					
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c) of Item 12.8 (E) Case II</b>				5513.00	
		<b>d) formwork</b>					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		826.95	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		220.52	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				1312.09	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				787.26	
		<b>Rate perm (a+b+c+d+e+f)</b>				8659.82	
							<b>say 8660.00</b>
13.5	<b>G</b>	<b>RCC Grade M30</b>					
	<b>(p)</b>	<b>Height upto 5m</b>					
		Same as Item 12.8 (G) upto 5m height, excluding formwork. For cost of formwork, add 10 per cent of cost of material, labour and machinery instead of 3.5 per cent .					
	<b>Case I</b>	<b>Using concrete Mixer</b>					
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c) of Item 12.8 (G) Case I</b>				5690.00	
		<b>d) formwork</b>					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		569.00	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				1251.80	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				751.08	
		<b>Rate perm (a+b+c+d+e+f)</b>				8261.88	
							<b>say 8262.00</b>
13.5 G (p)	<b>Case II</b>	<b>With Batching Plant, Transit Mixer and Concrete Pump</b>					
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c) of Item 12.8 (G) Case II</b>				5453.00	
		<b>d) formwork</b>					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		545.30	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				1199.66	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				719.80	
		<b>Rate perm (a+b+c+d+e+f)</b>				7917.76	
							<b>say 7918.00</b>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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				5690.00	
		d) formwork					
		Add 11.5 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.50		654.35	
		Add 1.6 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.60		91.04	
		e) Overhead charges @ 20 % on (a+b+c+d)				1287.08	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				772.25	
		Rate perm (a+b+c+d+e+f)				8494.71	
					say	<u>8495.00</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				5453.00	
		d) formwork					
		Add 11.5 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.50		627.10	
		Add 1.6 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.60		87.25	
		e) Overhead charges @ 20 % on (a+b+c+d)				1233.47	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				740.08	
		Rate perm (a+b+c+d+e+f)				8140.89	
					say	<u>8141.00</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				5690.00	
		d) formwork					
		Add 14 per cent of cost of material, labour and machinery (a+b+c) for Formwork		14.00		796.60	
		Add 3.5 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.50		199.15	
		e) Overhead charges @ 20 % on (a+b+c+d)				1337.15	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				802.29	
		Rate perm (a+b+c+d+e+f)				8825.19	
					say	<u>8825.00</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				5453.00	
		d) formwork					
		Add 14 per cent of cost of material, labour and machinery (a+b+c) for Formwork		14.00		763.42	
		Add 3.5 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.50		190.86	
		e) Overhead charges @ 20 % on (a+b+c+d)				1281.46	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				768.87	
		Rate perm (a+b+c+d+e+f)				8457.60	
					say	<u>8458.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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				5814.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		581.40	
		e) Overhead charges @ 20 % on (a+b+c+d)				1279.08	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				767.45	
		Rate perm (a+b+c+d+e+f)				8441.93	
							say <u>8442.00</u>
13.5 H	(p)	With Batching Plant, Transit Mixer and Concrete Pump					
	Case II	Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case II				5670.00	
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		567.00	
		e) Overhead charges @ 20 % on (a+b+c+d)				1247.40	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				748.44	
		Rate perm (a+b+c+d+e+f)				8232.84	
							say <u>8233.00</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				5814.00	
		d) formwork					
		Add 11 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.00		639.54	
		Add 1.4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.40		81.40	
		e) Overhead charges @ 20 % on (a+b+c+d)				1306.99	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				784.19	
		Rate perm (a+b+c+d+e+f)				8626.12	
							say <u>8626.00</u>
13.5 H	(q)	With Batching Plant, Transit Mixer and Concrete Pump					
	Case II	Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case II				5670.00	
		d) formwork					
		Add 11 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.00		623.70	
		Add 1.4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.40		79.38	
		e) Overhead charges @ 20 % on (a+b+c+d)				1274.62	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				764.77	
		Rate perm (a+b+c+d+e+f)				8412.47	
							say <u>8412.00</u>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.5 H	(r)	<b>Height above 10m</b>					
		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					
	<b>Case I</b>	<b>Using concrete Mixer</b>					
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c) of Item 12.8 (H) Case I</b>				5814.00	
		<b>d) formwork</b>					
		Add 13 per cent of cost of material, labour and machinery (a+b+c) for Formwork		13.00		755.82	
		Add 3 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.00		174.42	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				1348.85	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				809.31	
		<b>Rate perm (a+b+c+d+e+f)</b>				8902.40	
						<b>say</b>	<b>8902.00</b>
13.5 H	(r)	<b>With Batching Plant, Transit Mixer and Concrete Pump</b>					
	<b>Case II</b>	<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c) of Item 12.8 (H) Case II</b>				5670.00	
		<b>d) formwork</b>					
		Add 13 per cent of cost of material, labour and machinery (a+b+c) for Formwork		13.00		737.10	
		Add 3 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.00		170.10	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				1315.44	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				789.26	
		<b>Rate perm (a+b+c+d+e+f)</b>				8681.90	
						<b>say</b>	<b>8682.00</b>
	<b>Note</b>	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	<b>Section 1600 &amp; 2200</b>	<b>Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and Technical Specifications</b>					
		<b>Output: MT</b>					
		<b>Taking output = 1 MT</b>					
		<b>a) Material</b>					
		HYSD bars including 5 per cent overlaps and wastage	tonne	1.05	53650.00	56332.50	M-082
		Binding wire	kg	6.00	80.00	480.00	M-072
		<b>b) Labour for cutting, bending, shifting to site, tying and placing in position</b>					
		Mate	day	0.34	300.00	102.00	L-12
		Blacksmith	day	2.00	400.00	800.00	L-02
		Mazdoor	day	6.50	250.00	1625.00	L-13
		<b>c) Overhead charges @ 20 % on (a+b)</b>				11867.90	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				7120.74	
		<b>Rate for per MT (a+b+c+d)</b>				78328.14	
						<b>say</b>	<b>78328.00</b>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.7	1600 & 2200	Supplying, fitting and placing Mild steel reinforcement complete in sub-structure as per drawing and Technical Specification					
		<b>Unit = MT</b>					
		<b>Taking output = 1 MT</b>					
		<b>a) Material</b>					
		MS bars including 5 per cent overlaps and wastage	tonne	1.05	53650.00	56332.50	M-126
		Binding wire	kg	6.00	80.00	480.00	M-072
		<b>b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position</b>					
		Mate	day	0.28	300.00	84.00	L-12
		Blacksmith	day	1.50	400.00	600.00	L-02
		Mazdoor	day	5.50	250.00	1375.00	L-13
		<b>c) Overhead charges @ 20 % on (a+b)</b>				11774.30	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				7064.58	
		<b>Rate for per MT (a+b+c+d)</b>				77710.38	
					<b>say</b>	<b><u>77710.00</u></b>	
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					
		<b>Unit = Nos.</b>					
		<b>Taking output = 30 Nos.</b>					
		<b>a) Material</b>					
		AC pipe 100 mm dia. (including wastage @ 5 per cent )	metre	31.50	31.00	976.50	M-056
		Average length of weep hole is taken as one metre for the purpose of estimating.					
		MS clamp	each.	30.00	55.00	1650.00	M-123
		collar for AC pipe (average) taking 10% of above pipe rate	each.	10.00	3.10	31.00	M-056/10
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.05	4945.00	247.25	Item 12.6 (A)
		<b>b) Labour</b>					
		Mate	day	0.03	300.00	9.00	L-12
		Mason	day	0.50	400.00	200.00	L-11
		Mazdoor	day	0.25	250.00	62.50	L-13
		<b>c) Overhead charges @ 20 % on (a+b)</b>				635.25	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				381.15	
		Cost for 30 m = a+b+c+d				4192.65	
		<b>Rate per m (a+b+c+d)/30</b>				139.76	
					<b>say</b>	<b><u>140.00</u></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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.9	710.1.4. of IRC:78 & 2200	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical Specification					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
	A	<b>Granular material</b>					
		a) Labour					
		Mate	day	0.28	300.00	84.00	L-12
		Mazdoor	day	7.00	250.00	1750.00	L-13
		b) Material					
		Granular material	cum	12.00	390.00	4680.00	M-009
		c) Machinery					
		Plate compactor/power rammer	hour	2.50	303.00	757.50	P&M-086
		Water Tanker	hour	0.05	488.00	24.40	P&M-060
		d) Overhead charges @ 20 % on (a+b+c)				1459.18	
		e) Contractor's profit @ 10 % on (a+b+c+d)				875.51	
		Cost for 10 cum of granular backfill = a+b+c+d+e				9630.59	
		Rate per cum = (a+b+c+d+e)/10				963.06	
					say	<b>963.00</b>	
13.9		B Sandy material					
		a) Labour					
		Mate	day	0.28	300.00	84.00	L-12
		Mazdoor for filling, watering, ramming etc.	day	7.00	250.00	1750.00	L-13
		b) Material					
		Sand	cum	12.00	540.00	6480.00	M-006
		c) Machinery					
		Plate compactor/power rammer	hour	2.50	303.00	757.50	P&M-086
		Water Tanker	hour	0.06	488.00	29.28	P&M-060
		d) Overhead charges @ 20 % on (a+b+c)				1820.16	
		e) Contractor's profit @ 10 % on (a+b+c+d)				1092.09	
		Cost for 10 cum of sandy backfill = a+b+c+d+e				12013.03	
		Rate per cum = (a+b+c+d+e)/10				1201.30	
					say	<b>1201.00</b>	
13.10	710.1.4. of IRC:78 and 2200	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical Specification.					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum.</i>					
		a) Labour					
		Mate	day	0.32	300.00	96.00	L-12
		Mazdoor for filling, watering, ramming etc.	day	7.00	250.00	1750.00	L-13
		Mazdoor (Skilled)	day	1.00	400.00	400.00	L-15
		b) Material					
		Filter media of stone aggregate conforming to clause 2504.2.2. of MoRTH specifications.	cum	12.00	1150.00	13800.00	M-012

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Water Tanker of 6 KL capacity	hour	0.06	488.00	29.28	P&M-060
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				3215.06	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				1929.03	
		cost for 10 cum of Fiter Media = a+b+c+d+e				21219.37	
		<b>Rate per cum = (a+b+c+d+e)/10</b>				2121.94	
					<b>say</b>	<b><u>2122.00</u></b>	
13.11	2000, 1000 & 2200	<b>Supplying, fitting and fixing in position true to line and level cast steel rocker bearing conforming to IRC: 83(Pt. 1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.</b>					
		Unit: one tonne capacity					
		Considering a 250 tonne capacity bearing for this analysis					
		<b>a) Labour</b>					
		Mate	day	0.06	300.00	18.00	L-12
		Mazdoor (Skilled)	day	0.50	400.00	200.00	L-15
		Mazdoor	day	1.00	250.00	250.00	L-13
		<b>b) Material</b>					
		Cast steel rocker bearing assembly of 250 tonne design load capacity duly painted complete with all its components as per drawing and specifications	each.	1.00	302500.00	302500.00	M-065
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.				3025.00	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				61198.60	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				36719.16	
		cost for 250 tonnes capacity bearing = a+b+c+d				403910.76	
		<b>Rate per tonne capacity = (a+b+c+d)/250</b>				1615.64	
					<b>say</b>	<b><u>1616.00</u></b>	
13.12	2000 , 1000 & 2200	<b>Supplying, fitting and fixing in position true to line and level forged steel roller bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.</b>					
		Unit: one tonne capacity					
		Considering a 250 tonne capacity bearing for this analysis					
		<b>a) Labour</b>					
		Mate	day	0.06	300.00	18.00	L-12
		Mazdoor	day	1.00	250.00	250.00	L-13
		Mazdoor (Skilled)	day	0.50	400.00	200.00	L-15
		<b>b) Material</b>					
		Forged steel roller bearing of 250 tonne design load capacity duly painted complete with all its components as per drawing and specifications	each.	1.00	266200.00	266200.00	M-067
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.				2662.00	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				53866.00	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				32319.60	
		cost for 250 tonnes capacity bearing = a+b+c+d				355515.60	
		<b>Rate per tonne capacity = (a+b+c+d)/250</b>				1422.06	
					<b>say</b>	<b><u>1422.00</u></b>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.13	2000 & 2200	Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel complete including all accessories as per drawing and Technical Specifications and BS: 5400, section 9.1 & 9.2 (for PTFE) and clause 2004 of MoRTH Specifications.					
		Unit: one tonne capacity					
		Considering a 80 tonne capacity bearing for this analysis					
		<b>a) Labour</b>					
		Mate	day	0.06	300.00	18.00	L-12
		Mazdoor	day	1.00	250.00	250.00	L-13
		Mazdoor (Skilled)	day	0.50	400.00	200.00	L-15
		<b>b) Material</b>					
		PTFE sliding plate bearing assembly of 80 tonnes design load capacity duly painted complete with all its components as per drawing and Technical Specifications	each.	1.00	181500.00	181500.00	M-069
		Add 1 per cent for foundation anchorage bolts and consumables.				1815.00	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				36756.60	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				22053.96	
		cost for 80 tonnes capacity bearing = a+b+c+d				242593.56	
		<b>Rate per tonne capacity = (a+b+c+d)/80</b>				3032.42	
					say	<u>3032.00</u>	
13.14	2000 & 2200	Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and clause 2005 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.					
		Unit: one cubic centimetre					
		Considering an elastomeric bearing of size 500 x 400 x 96 mm for this analysis.					
		Overall volume - 19200 cu.cm					
		Volume of 6 nos. 488 x 388 x 4 mm size reinforcing steel plates = 4545 cu.cm.					
		Hence volume of elastometer = 14655 cu.cm.					
		<b>a) Labour</b>					
		Mate	day	0.06	300.00	18.00	L-12
		Mazdoor	day	1.00	250.00	250.00	L-13
		Mazdoor (Skilled)	day	0.50	400.00	200.00	L-15
		<b>b) Material</b>					
		Elastomeric bearing assembly consisting of 7 layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanisation, complete with all components as per drawing and Technical Specifications.	each.	1.00	14520.00	14520.00	M-066
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.				145.20	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				3026.64	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1815.98	
		cost for 19200cc of elastomeric bearing = a+b+c+d				19975.82	
		<b>Rate per cc of elastomeric bearing = (a+b+c+d)/19200</b>				1.04	
					say	<u>1.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
13.15	2000 & 2200	Supplying, fitting and fixing in position true to line and level sliding plate bearing with stainless steel plate sliding on stainless steel plate with mild steel matrix complete including all accessories as per drawing and Technical Specifications.					
		Unit: one tonne capacity					
		Considering the sliding bearing of 80 tonnes design capacity for this analysis.					
		<b>a) Labour</b>					
		Mate	day	0.04	300.00	12.00	L-12
		Mazdoor	day	0.75	250.00	187.50	L-13
		Mazdoor (Skilled)	day	0.35	400.00	140.00	L-15
		<b>b) Material</b>					
		Supply of sliding plate bearing of 80 tonne design capacity complete as per drawings and Technical Specifications.	each.	1.00	14520.00	14520.00	M-070
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.				145.20	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				3000.94	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1800.56	
		cost for 80 tonnes of capacity bearing = a+b+c+d				19806.20	
						247.58	
					say	<b>248.00</b>	
13.16	2000 & 2200	Supplying, fitting and fixing in position true to line and level POT-PTFE bearing consisting of a metal piston supported by a disc or unreinforced elastomer confined within a metal cylinder, sealing rings, dust seals, PTFE surface sliding against stainless steel mating surface, complete assembly to be of cast steel/fabricated structural steel, metal and elastomer elements to be as per IRC: 83 part-I & II respectively and other parts conforming to BS: 5400, section 9.1 & 9.2 and clause 2006 of MoRTH Specifications complete as per drawing and approved Technical Specifications.					
		Unit: one tonne capacity			387.20		
		Considering a Pot bearing assembly of 250 tonne capacity for this analysis.					
		<b>a) Labour</b>					
		Mate	day	0.08	300.00	24.00	L-12
		Mazdoor	day	1.50	250.00	375.00	L-13
		Mazdoor (Skilled)	day	0.50	400.00	200.00	L-15
		<b>b) Material</b>					
		Pot type bearing assembly consisting of a metal piston supported by a disc, PTFE pads providing sliding surfaces against stainless steel mating together with cast steel assemblies/fabricated structural steel assemblies duly painted with all components as per clause 2006 and complete as per drawings and Technical Specifications.	each.	1.00	60500.00	60500.00	M-068
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.				605.00	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				12340.80	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				7404.48	
		cost for 250 tonnes capacity bearing = a+b+c+d				81449.28	
		<b>Rate per tonne capacity = (a+b+c+d)/250</b>				325.80	
					say	<b>326.00</b>	

## Chapter – 14

### SUPERSTRUCTURE

#### Preamble:

- 1 The rate for the wearing coat has been analysed as under in accordance with the provisions of MORD Specifications:
  - a. Cement concrete wearing coat
  - b. Ashphaltic concrete wearing coat
  - c. Bitumen mastic wearing coat

The item may be selected as per approved design
- 2 The rates are provided for both RCC Railing and M. S. Railing, which can be adopted as per approved design.
- 3 The length of drainage spout has been provided in such a way that it is connected to the drainage system on the ground in case of flyovers and there is no splashing of water on the structure in case of bridges.
- 4 The rate for anti-corrosive treatment is ascertained from firms specialised in this work. In this connection Circular No. RW/NH-34041/44/91-S&R dated 21.03.2000 of Ministry of Road Transport and Highways may be referred for further details
- 5 Expansion joints involving movements exceeding 40 mm are specialised readymade items commercially produced by reputed firms with imported technology and parts. The rates for such joints are ascertained from the firms pre-qualified by the Ministry.
- 6 The Rates for pre-cast and pre-tensioned girders has also been included.
- 7 MoRT&H letter No. RW/NH-34059/1/96 S&R dated 30-11-2000 and subsequent corrigendum dated 25-01-2001 may be referred for detailed specifications and provisions for various types of expansion joints.
- 8 For bridges having wide deck/span length of more than 120 m or/and involving complex movements/rotations in different directions/planes, provision of special type of modular expansion joints such as swivel joists joint are required for which firms specialised in this field may be consulted. Such cases will require prior approval of Ministry.

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>					
			a) Material					
			Cement	tonne	5.12	8120.00	41574.40	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
			10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
			b) Labour					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>		<b>77382.00</b>			
			For formwork and staging add the following:					
14.1A		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
Case I		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				77382.00	
			d) Formwork and staging 20 per cent of (a+b+c)				15476.40	
			e) Overhead charges @ 20 % on (a+b+c+d)				18571.68	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				11143.01	
			Cost for 15 cum = a+b+c+d+e+f				122573.09	
			Rate per cum = (a+b+c+d+e+f)/15				8171.54	
						<b>say</b>	<b>8172.00</b>	
14.1A		(q)	Height 5m to 10m					
Case I (i)			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				77382.00	
			d) Formwork and staging 25 per cent of (a+b+c)				19345.50	
			e) Overhead charges @ 20 % on (a+b+c+d)				19345.50	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				11607.30	
			Cost for 15 cum = a+b+c+d+e+f				127680.30	
			Rate per cum = (a+b+c+d+e+f)/15				8512.02	
						<b>say</b>	<b>8512.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1A Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				77382.00	
			d) Formwork and staging 30 per cent of (a+b+c)				23214.60	
			e) Overhead charges @ 20 % on (a+b+c+d)				20119.32	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				12071.59	
			Cost for 15 cum = a+b+c+d+e+f				132787.51	
			Rate per cum = (a+b+c+d+e+f)/15				8852.50	
						say	<u>8853.00</u>	
14.1A Case I		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				77382.00	
			d) Formwork and staging 25 per cent of (a+b+c)				19345.50	
			e) Overhead charges @ 20 % on (a+b+c+d)				19345.50	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				11607.30	
			Cost for 15 cum = a+b+c+d+e+f				127680.30	
			Rate per cum = (a+b+c+d+e+f)/15				8512.02	
						say	<u>8512.00</u>	
14.1A Case I (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				77382.00	
			d) Formwork and staging 30 per cent of (a+b+c)				23214.60	
			e) Overhead charges @ 20 % on (a+b+c+d)				20119.32	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				12071.59	
			Cost for 15 cum = a+b+c+d+e+f				132787.51	
			Rate per cum = (a+b+c+d+e+f)/15				8852.50	
						say	<u>8853.00</u>	
14.1A Case I (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				77382.00	
			d) Formwork and staging 35 per cent of (a+b+c)				27083.70	
			e) Overhead charges @ 20 % on (a+b+c+d)				20893.14	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				12535.88	
			Cost for 15 cum = a+b+c+d+e+f				137894.72	
			Rate per cum = (a+b+c+d+e+f)/15				9192.98	
						say	<u>9193.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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	8120.00	332270.40	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.84	300.00	252.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1016.00	15240.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	Lead =0 km & P&M-050
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>590307.00</b>			
			<b>For formwork and staging add the following:</b>					
14.1A		(i)	<b>For solid slab super-structure, 20-30 per cent of (a+b+c)</b>					
Case II		(p)	<b>Height upto 5m</b>					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				590307.00	
			<b>d) Formwork and staging 20 per cent of (a+b+c)</b>				118061.40	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				141673.68	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				85004.21	
			Cost for 120 cum = a+b+c+d+e+f				935046.29	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				7792.05	
						<b>say</b>	<b>7792.00</b>	
14.1A		(q)	<b>Height 5m to 10m</b>					
Case II		(i)						
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				590307.00	
			<b>d) Formwork and staging 25 per cent of (a+b+c)</b>				147576.75	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				147576.75	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				88546.05	
			Cost for 120 cum = a+b+c+d+e+f				974006.55	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				8116.72	
						<b>say</b>	<b>8117.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1A Case II (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				590307.00	
			d) Formwork and staging 30 per cent of (a+b+c)				177092.10	
			e) Overhead charges @ 20 % on (a+b+c+d)				153479.82	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				92087.89	
			Cost for 120 cum = a+b+c+d+e+f				1012966.81	
			Rate per cum = (a+b+c+d+e+f)/120				8441.39	
						say	<u>8441.00</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				590307.00	
			d) Formwork and staging 25 per cent of (a+b+c)				147576.75	
			e) Overhead charges @ 20 % on (a+b+c+d)				147576.75	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				88546.05	
			Cost for 120 cum = a+b+c+d+e+f				974006.55	
			Rate per cum = (a+b+c+d+e+f)/120				8116.72	
						say	<u>8117.00</u>	
14.1A Case II (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				590307.00	
			d) Formwork and staging 30 per cent of (a+b+c)				177092.10	
			e) Overhead charges @ 20 % on (a+b+c+d)				153479.82	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				92087.89	
			Cost for 120 cum = a+b+c+d+e+f				1012966.81	
			Rate per cum = (a+b+c+d+e+f)/120				8441.39	
						say	<u>8441.00</u>	
14.1A Case II (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				590307.00	
			d) Formwork and staging 35 per cent of (a+b+c)				206607.45	
			e) Overhead charges @ 20 % on (a+b+c+d)				159382.89	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				95629.73	
			Cost for 120 cum = a+b+c+d+e+f				1051927.07	
			Rate per cum = (a+b+c+d+e+f)/120				8766.06	
						say	<u>8766.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1		B	RCC Grade M25					
		Case I	Using Concrete Mixer					
			<i>Unit = 1 cum</i>					
			<i>Taking output = 15 cum</i>					
			a) Material					
			Cement	tonne	5.99	8120.00	48638.80	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
			10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
			b) Labour					
			Mate	day	0.86	300.00	258.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>		<b>84446.00</b>			
			For formwork and staging add the following:					
14.1B		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
Case I		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				84446.00	
			d) Formwork and staging 20 per cent of (a+b+c)				16889.20	
			e) Overhead charges @ 20 % on (a+b+c+d)				20267.04	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				12160.22	
			Cost for 15 cum = a+b+c+d+e+f				133762.46	
			Rate per cum = (a+b+c+d+e+f)/15				8917.50	
						<b>say</b>	<b>8917.00</b>	
14.1B		(q)	Height 5m to 10m					
Case I (i)			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				84446.00	
			d) Formwork and staging 25 per cent of (a+b+c)				21111.50	
			e) Overhead charges @ 20 % on (a+b+c+d)				21111.50	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				12666.90	
			Cost for 15 cum = a+b+c+d+e+f				139335.90	
			Rate per cum = (a+b+c+d+e+f)/15				9289.06	
						<b>say</b>	<b>9289.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1B Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				84446.00	
			d) Formwork and staging 30 per cent of (a+b+c)				25333.80	
			e) Overhead charges @ 20 % on (a+b+c+d)				21955.96	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				13173.58	
			Cost for 15 cum = a+b+c+d+e+f				144909.34	
			Rate per cum = (a+b+c+d+e+f)/15				9660.62	
						say	<u>9661.00</u>	
14.1B Case I		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				84446.00	
			d) Formwork and staging 25 per cent of (a+b+c)				21111.50	
			e) Overhead charges @ 20 % on (a+b+c+d)				21111.50	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				12666.90	
			Cost for 15 cum = a+b+c+d+e+f				139335.90	
			Rate per cum = (a+b+c+d+e+f)/15				9289.06	
						say	<u>9289.00</u>	
14.1B Case I (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				84446.00	
			d) Formwork and staging 30 per cent of (a+b+c)				25333.80	
			e) Overhead charges @ 20 % on (a+b+c+d)				21955.96	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				13173.58	
			Cost for 15 cum = a+b+c+d+e+f				144909.34	
			Rate per cum = (a+b+c+d+e+f)/15				9660.62	
						say	<u>9661.00</u>	
14.1B Case I (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				84446.00	
			d) Formwork and staging 35 per cent of (a+b+c)				29556.10	
			e) Overhead charges @ 20 % on (a+b+c+d)				22800.42	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				13680.25	
			Cost for 15 cum = a+b+c+d+e+f				150482.77	
			Rate per cum = (a+b+c+d+e+f)/15				10032.18	
						say	<u>10032.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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	8120.00	389354.00	M-081
			Coarse sand	cum	54.20	540.00	29268.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.84	300.00	252.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	18.00	250.00	4500.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1016.00	15240.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	Lead =0 km & P&M-050
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>647498.00</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				647498.00	
			<b>d) Formwork and staging 20 per cent of (a+b+c)</b>				129499.60	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				155399.52	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				93239.71	
			Cost for 120 cum = a+b+c+d+e+f				1025636.83	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				8546.97	
						<b>say</b>	<b>8547.00</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				647498.00	
			<b>d) Formwork and staging 25 per cent of (a+b+c)</b>				161874.50	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				161874.50	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				97124.70	
			Cost for 120 cum = a+b+c+d+e+f				1068371.70	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				8903.10	
						<b>say</b>	<b>8903.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1B Case II (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				647498.00	
			d) Formwork and staging 30 per cent of (a+b+c)				194249.40	
			e) Overhead charges @ 20 % on (a+b+c+d)				168349.48	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				101009.69	
			Cost for 120 cum = a+b+c+d+e+f				1111106.57	
			Rate per cum = (a+b+c+d+e+f)/120				9259.22	
						say	<u>9259.00</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				647498.00	
			d) Formwork and staging 25 per cent of (a+b+c)				161874.50	
			e) Overhead charges @ 20 % on (a+b+c+d)				161874.50	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				97124.70	
			Cost for 120 cum = a+b+c+d+e+f				1068371.70	
			Rate per cum = (a+b+c+d+e+f)/120				8903.10	
						say	<u>8903.00</u>	
14.1B Case II (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				647498.00	
			d) Formwork and staging 30 per cent of (a+b+c)				194249.40	
			e) Overhead charges @ 20 % on (a+b+c+d)				168349.48	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				101009.69	
			Cost for 120 cum = a+b+c+d+e+f				1111106.57	
			Rate per cum = (a+b+c+d+e+f)/120				9259.22	
						say	<u>9259.00</u>	
14.1B Case II (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				647498.00	
			d) Formwork and staging 35 per cent of (a+b+c)				226624.30	
			e) Overhead charges @ 20 % on (a+b+c+d)				174824.46	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				104894.68	
			Cost for 120 cum = a+b+c+d+e+f				1153841.44	
			Rate per cum = (a+b+c+d+e+f)/120				9615.35	
						say	<u>9615.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1		C	RCC Grade M 30					
		Case I	Using Concrete Mixer					
			<i>Unit = 1 cum</i>					
			<i>Taking output = 15 cum</i>					
			a) Material					
			Cement	tonne	6.10	8120.00	49532.00	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
			10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
			b) Labour					
			Mate	day	0.90	300.00	270.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	21.00	250.00	5250.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>		<b>85601.00</b>			
			For formwork and staging add the following:					
14.1C		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
Case I		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				85601.00	
			d) Formwork and staging 20 per cent of (a+b+c)				17120.20	
			e) Overhead charges @ 20 % on (a+b+c+d)				20544.24	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				12326.54	
			Cost for 15 cum = a+b+c+d+e+f				135591.98	
			Rate per cum = (a+b+c+d+e+f)/15				9039.47	
						<b>say</b>	<b>9039.00</b>	
14.1C		(q)	Height 5m to 10m					
Case I (i)			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				85601.00	
			d) Formwork and staging 25 per cent of (a+b+c)				21400.25	
			e) Overhead charges @ 20 % on (a+b+c+d)				21400.25	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				12840.15	
			Cost for 15 cum = a+b+c+d+e+f				141241.65	
			Rate per cum = (a+b+c+d+e+f)/15				9416.11	
						<b>say</b>	<b>9416.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1C Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				85601.00	
			d) Formwork and staging 30 per cent of (a+b+c)				25680.30	
			e) Overhead charges @ 20 % on (a+b+c+d)				22256.26	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				13353.76	
			Cost for 15 cum = a+b+c+d+e+f				146891.32	
			Rate per cum = (a+b+c+d+e+f)/15				9792.75	
						say	<u>9793.00</u>	
14.1C Case I		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				85601.00	
			d) Formwork and staging 25 per cent of (a+b+c)				21400.25	
			e) Overhead charges @ 20 % on (a+b+c+d)				21400.25	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				12840.15	
			Cost for 15 cum = a+b+c+d+e+f				141241.65	
			Rate per cum = (a+b+c+d+e+f)/15				9416.11	
						say	<u>9416.00</u>	
14.1C Case I (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				85601.00	
			d) Formwork and staging 30 per cent of (a+b+c)				25680.30	
			e) Overhead charges @ 20 % on (a+b+c+d)				22256.26	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				13353.76	
			Cost for 15 cum = a+b+c+d+e+f				146891.32	
			Rate per cum = (a+b+c+d+e+f)/15				9792.75	
						say	<u>9793.00</u>	
14.1C Case I (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				85601.00	
			d) Formwork and staging 35 per cent of (a+b+c)				29960.35	
			e) Overhead charges @ 20 % on (a+b+c+d)				23112.27	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				13867.36	
			Cost for 15 cum = a+b+c+d+e+f				152540.98	
			Rate per cum = (a+b+c+d+e+f)/15				10169.40	
						say	<u>10169.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1C		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	48.79	8120.00	396174.80	M-081
			Coarse sand	cum	54.60	540.00	29484.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			<b>b) Labour</b>					
			Mate	day	0.88	300.00	264.00	L-12
			Mason	day	3.00	400.00	1200.00	L-11
			Mazdoor	day	19.00	250.00	4750.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1016.00	15240.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	Lead =0 km & P&M-050
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>654797.00</b>			
			<b>For formwork and staging add the following:</b>					
14.1C Case II		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				654797.00	
			<b>d) Formwork and staging 20 per cent of (a+b+c)</b>				130959.40	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				157151.28	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				94290.77	
			Cost for 120 cum = a+b+c+d+e+f				1037198.45	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				8643.32	
						<b>say</b>	<b>8643.00</b>	
14.1C Case II (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				654797.00	
			<b>d) Formwork and staging 25 per cent of (a+b+c)</b>				163699.25	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				163699.25	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				98219.55	
			Cost for 120 cum = a+b+c+d+e+f				1080415.05	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				9003.46	
						<b>say</b>	<b>9003.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1C Case II (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				654797.00	
			d) Formwork and staging 30 per cent of (a+b+c)				196439.10	
			e) Overhead charges @ 20 % on (a+b+c+d)				170247.22	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				102148.33	
			Cost for 120 cum = a+b+c+d+e+f				1123631.65	
			Rate per cum = (a+b+c+d+e+f)/120				9363.60	
						say	<u>9364.00</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				654797.00	
			d) Formwork and staging 25 per cent of (a+b+c)				163699.25	
			e) Overhead charges @ 20 % on (a+b+c+d)				163699.25	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				98219.55	
			Cost for 120 cum = a+b+c+d+e+f				1080415.05	
			Rate per cum = (a+b+c+d+e+f)/120				9003.46	
						say	<u>9003.00</u>	
14.1C Case II (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				654797.00	
			d) Formwork and staging 30 per cent of (a+b+c)				196439.10	
			e) Overhead charges @ 20 % on (a+b+c+d)				170247.22	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				102148.33	
			Cost for 120 cum = a+b+c+d+e+f				1123631.65	
			Rate per cum = (a+b+c+d+e+f)/120				9363.60	
						say	<u>9364.00</u>	
14.1C Case II (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				654797.00	
			d) Formwork and staging 35 per cent of (a+b+c)				229178.95	
			e) Overhead charges @ 20 % on (a+b+c+d)				176795.19	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				106077.11	
			Cost for 120 cum = a+b+c+d+e+f				1166848.25	
			Rate per cum = (a+b+c+d+e+f)/120				9723.74	
						say	<u>9724.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1		D	RCC/PSC Grade M35					
		Case I	Using Concrete Mixer.					
			<i>Unit = 1 cum</i>					
			<i>Taking output = 15 cum</i>					
			a) Material					
			Cement	tonne	6.33	8120.00	51399.60	M-081
			Coarse sand	cum	6.75	540.00	3645.00	M-005
			20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
			10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
			b) Labour					
			Mate	day	0.90	300.00	270.00	L-12
			Mason	day	1.50	400.00	600.00	L-11
			Mazdoor	day	21.00	250.00	5250.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
			Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>			<b>87469.00</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)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				87469.00	
			d) Formwork and staging 18 per cent of (a+b+c)				15744.42	
			e) Overhead charges @ 20 % on (a+b+c+d)				20642.68	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				12385.61	
			Cost for 15 cum = a+b+c+d+e+f				136241.71	
			Rate per cum = (a+b+c+d+e+f)/15				9082.78	
							<b>say 9083.00</b>	
14.1D Case I (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				87469.00	
			d) Formwork and staging 23 per cent of (a+b+c)				20117.87	
			e) Overhead charges @ 20 % on (a+b+c+d)				21517.37	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				12910.42	
			Cost for 15 cum = a+b+c+d+e+f				142014.67	
			Rate per cum = (a+b+c+d+e+f)/15				9467.64	
							<b>say 9468.00</b>	
14.1D Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				87469.00	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Formwork and staging 28 per cent of (a+b+c)				24491.32	
		e) Overhead charges @ 20 % on (a+b+c+d)				22392.06	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				13435.24	
		Cost for 15 cum = a+b+c+d+e+f				147787.62	
		Rate per cum = (a+b+c+d+e+f)/15				9852.51	
					say	<u>9853.00</u>	
14.1D Case I	(ii)	For T-beam & slab, 23-33 per cent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				87469.00	
		d) Formwork and staging 23 per cent of (a+b+c)				20117.87	
		e) Overhead charges @ 20 % on (a+b+c+d)				21517.37	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				12910.42	
		Cost for 15 cum = a+b+c+d+e+f				142014.67	
		Rate per cum = (a+b+c+d+e+f)/15				9467.64	
					say	<u>9468.00</u>	
14.1D Case I (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				87469.00	
		d) Formwork and staging 28 per cent of (a+b+c)				24491.32	
		e) Overhead charges @ 20 % on (a+b+c+d)				22392.06	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				13435.24	
		Cost for 15 cum = a+b+c+d+e+f				147787.62	
		Rate per cum = (a+b+c+d+e+f)/15				9852.51	
					say	<u>9853.00</u>	
14.1D Case I (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				87469.00	
		d) Formwork and staging 33 per cent of (a+b+c)				28864.77	
		e) Overhead charges @ 20 % on (a+b+c+d)				23266.75	
		f) Contractor's profit @ 10 % on (a+b+c+d+e)				13960.05	
		Cost for 15 cum = a+b+c+d+e+f				153560.58	
		Rate per cum = (a+b+c+d+e+f)/15				10237.37	
					say	<u>10237.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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				87469.00	
			d) Formwork and staging 38 per cent of (a+b+c)				33238.22	
			e) Overhead charges @ 20 % on (a+b+c+d)				24141.44	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				14484.87	
			Cost for 15 cum = a+b+c+d+e+f				159333.53	
			Rate per cum = (a+b+c+d+e+f)/15				10622.24	
						say	<u>10622.00</u>	
14.1D Case I (iii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				87469.00	
			d) Formwork and staging 48 per cent of (a+b+c)				41985.12	
			e) Overhead charges @ 20 % on (a+b+c+d)				25890.82	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				15534.49	
			Cost for 15 cum = a+b+c+d+e+f				170879.44	
			Rate per cum = (a+b+c+d+e+f)/15				11391.96	
						say	<u>11392.00</u>	
14.1D Case I (iii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				87469.00	
			d) Formwork and staging 58 per cent of (a+b+c)				50732.02	
			e) Overhead charges @ 20 % on (a+b+c+d)				27640.20	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				16584.12	
			Cost for 15 cum = a+b+c+d+e+f				182425.35	
			Rate per cum = (a+b+c+d+e+f)/15				12161.69	
						say	<u>12162.00</u>	
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
			a) Material					
			Cement	tonne	50.64	8120.00	411196.80	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Labour</b>					
		Mate	day	0.88	300.00	264.00	L-12
		Mason	day	3.00	400.00	1200.00	L-11
		Mazdoor	day	19.00	250.00	4750.00	L-13
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
		Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
		Loader	hour	6.00	1253.00	7518.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1016.00	15240.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	Lead =0 km & P&M-050
		Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>669495.00</b>			
		<b>For formwork and staging add the following:</b>					
14.1D Case II	(i)	<b>For solid 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				669495.00	
		<b>d) Formwork and staging 18 per cent of (a+b+c)</b>				120509.10	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				158000.82	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				94800.49	
		Cost for 120 cum = a+b+c+d+e+f				1042805.41	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				8690.05	
					<b>say</b>	<b>8690.00</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				669495.00	
		<b>d) Formwork and staging 23 per cent of (a+b+c)</b>				153983.85	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				164695.77	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				98817.46	
		Cost for 120 cum = a+b+c+d+e+f				1086992.08	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				9058.27	
					<b>say</b>	<b>9058.00</b>	
14.1D Case II (i)	(r)	<b>Height above 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				669495.00	
		<b>d) Formwork and staging 28 per cent of (a+b+c)</b>				187458.60	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				171390.72	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				102834.43	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 120 cum = a+b+c+d+e+f				1131178.75	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				9426.49	
					<b>say</b>	<b>9426.00</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				669495.00	
		<b>d) Formwork and staging 23 per cent of (a+b+c)</b>				153983.85	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				164695.77	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				98817.46	
		Cost for 120 cum = a+b+c+d+e+f				1086992.08	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				9058.27	
					<b>say</b>	<b>9058.00</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				669495.00	
		<b>d) Formwork and staging 28 per cent of (a+b+c)</b>				187458.60	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				171390.72	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				102834.43	
		Cost for 120 cum = a+b+c+d+e+f				1131178.75	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				9426.49	
					<b>say</b>	<b>9426.00</b>	
14.1D Case II (ii)	(r)	<b>Height above 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				669495.00	
		<b>d) Formwork and staging 33 per cent of (a+b+c)</b>				220933.35	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				178085.67	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				106851.40	
		Cost for 120 cum = a+b+c+d+e+f				1175365.42	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				9794.71	
					<b>say</b>	<b>9795.00</b>	
14.1D Case II	(iii)	<b>For box girder 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				669495.00	
		<b>d) Formwork and staging 38 per cent of (a+b+c)</b>				254408.10	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				184780.62	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				110868.37	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 120 cum = a+b+c+d+e+f				1219552.09	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				10162.93	
					<b>say</b>	<b>10163.00</b>	
14.1D Case II (iii)	(q)	<b>Height 5m to 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				669495.00	
		<b>d) Formwork and staging 48 per cent of (a+b+c)</b>				321357.60	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				198170.52	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				118902.31	
		Cost for 120 cum = a+b+c+d+e+f				1307925.43	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				10899.38	
					<b>say</b>	<b>10899.00</b>	
14.1D Case II (iii)	(r)	<b>Height above 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				669495.00	
		<b>d) Formwork and staging 58 per cent of (a+b+c)</b>				388307.10	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				211560.42	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				126936.25	
		Cost for 120 cum = a+b+c+d+e+f				1396298.77	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				11635.82	
					<b>say</b>	<b>11636.00</b>	
14.1	E Case 1	<b>PSC Grade M-40</b>					
		<b>Using concrete mixer.</b>					
		<b>Unit = 1 cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	6.45	8120.00	52374.00	M-081
		Coarse sand	cum	6.75	540.00	3645.00	M-005
		20 mm Aggregate	cum	8.10	1600.00	12960.00	M-053
		10 mm Aggregate	cum	5.40	1750.00	9450.00	M-051
		Admixture @ 0.4 per cent of cement	kg	25.80	55.00	1419.00	M-180
		<b>b) Labour</b>					
		Mate	day	0.96	300.00	288.00	L-12
		Mason	day	2.00	400.00	800.00	L-11
		Mazdoor	day	22.00	250.00	5500.00	L-13
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	242.00	1452.00	P&M-009
		Generator 33 KVA	hour	6.00	407.00	2442.00	P&M-079
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>			<b>90330.00</b>		
		<b>For formwork and staging add the following:</b>					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
14.1E Case I		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)						
		(p)	Height upto 5m						
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum					90330.00	
			d) Formwork and staging 20 per cent of (a+b+c)					18066.00	
			e) Overhead charges @ 20 % on (a+b+c+d)					21679.20	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)					13007.52	
			Cost for 15 cum = a+b+c+d+e+f					143082.72	
			Rate per cum = (a+b+c+d+e+f)/15					9538.85	
						say	<u>9539.00</u>		
14.1E Case I (i)		(q)	Height 5m to 10m						
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum					90330.00	
			d) Formwork and staging 25 per cent of (a+b+c)					22582.50	
			e) Overhead charges @ 20 % on (a+b+c+d)					22582.50	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)					13549.50	
			Cost for 15 cum = a+b+c+d+e+f					149044.50	
			Rate per cum = (a+b+c+d+e+f)/15					9936.30	
								say	<u>9936.00</u>
14.1E Case I (i)		(r)	Height above 10m						
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum					90330.00	
			d) Formwork and staging 30 per cent of (a+b+c)					27099.00	
			e) Overhead charges @ 20 % on (a+b+c+d)					23485.80	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)					14091.48	
			Cost for 15 cum = a+b+c+d+e+f					155006.28	
			Rate per cum = (a+b+c+d+e+f)/15					10333.75	
								say	<u>10334.00</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					90330.00	
			d) Formwork and staging 25 per cent of (a+b+c)					22582.50	
			e) Overhead charges @ 20 % on (a+b+c+d)					22582.50	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)					13549.50	
			Cost for 15 cum = a+b+c+d+e+f					149044.50	
			Rate per cum = (a+b+c+d+e+f)/15					9936.30	
						say	<u>9936.00</u>		

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1E Case I (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				90330.00	
			d) Formwork and staging 30 per cent of (a+b+c)				27099.00	
			e) Overhead charges @ 20 % on (a+b+c+d)				23485.80	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				14091.48	
			Cost for 15 cum = a+b+c+d+e+f				155006.28	
			Rate per cum = (a+b+c+d+e+f)/15				10333.75	
						say	<b>10334.00</b>	
14.1E Case I (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				90330.00	
			d) Formwork and staging 35 per cent of (a+b+c)				31615.50	
			e) Overhead charges @ 20 % on (a+b+c+d)				24389.10	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				14633.46	
			Cost for 15 cum = a+b+c+d+e+f				160968.06	
			Rate per cum = (a+b+c+d+e+f)/15				10731.20	
						say	<b>10731.00</b>	
14.1E		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			<b>Unit = cum</b>					
			<b>Taking output = 120 cum</b>					
			a) Material					
			Cement	tonne	51.60	8120.00	418992.00	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			Admixture @ 0.4 per cent of cement	kg	206.40	55.00	11352.00	M-180
			b) Labour					
			Mate	day	0.94	300.00	282.00	L-12
			Mason	day	3.50	400.00	1400.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1016.00	15240.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	Lead =0 km & P&M-050
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>689110.00</b>			
			For formwork and staging add the following:					

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
14.1E Case II		(i)	For solid/voided slab super-structure, 18-28 per cent of (a+b+c)						
		(p)	Height upto 5m						
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					689110.00	
			d) Formwork and staging 18 per cent of (a+b+c)					124039.80	
			e) Overhead charges @ 20 % on (a+b+c+d)					162629.96	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)					97577.98	
			Cost for 15 cum = a+b+c+d+e+f					1073357.74	
			Rate per cum = (a+b+c+d+e+f)/120					8944.65	
						say	<u>8945.00</u>		
14.1E Case II (i)		(q)	Height 5m to 10m						
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					689110.00	
			d) Formwork and staging 23 per cent of (a+b+c)					158495.30	
			e) Overhead charges @ 20 % on (a+b+c+d)					169521.06	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)					101712.64	
			Cost for 120 cum = a+b+c+d+e+f					1118839.00	
			Rate per cum = (a+b+c+d+e+f)/120					9323.66	
								say	<u>9324.00</u>
14.1E Case II (i)		(r)	Height above 10m						
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					689110.00	
			d) Formwork and staging 28 per cent of (a+b+c)					192950.80	
			e) Overhead charges @ 20 % on (a+b+c+d)					176412.16	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)					105847.30	
			Cost for 120 cum = a+b+c+d+e+f					1164320.26	
			Rate per cum = (a+b+c+d+e+f)/120					9702.67	
								say	<u>9703.00</u>
14.1E Case II		(ii)	For T-beam & slab, 23-33 per cent of (a+b+c)						
		(p)	Height upto 5m						
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					689110.00	
			d) Formwork and staging 23 per cent of (a+b+c)					158495.30	
			e) Overhead charges @ 20 % on (a+b+c+d)					169521.06	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)					101712.64	
			Cost for 120 cum = a+b+c+d+e+f					1118839.00	
			Rate per cum = (a+b+c+d+e+f)/120					9323.66	
						say	<u>9324.00</u>		

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1E Case II (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				689110.00	
			d) Formwork and staging 28 per cent of (a+b+c)				192950.80	
			e) Overhead charges @ 20 % on (a+b+c+d)				176412.16	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				105847.30	
			Cost for 120 cum = a+b+c+d+e+f				1164320.26	
			Rate per cum = (a+b+c+d+e+f)/120				9702.67	
						say	<u>9703.00</u>	
14.1E Case II (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				689110.00	
			d) Formwork and staging 33 per cent of (a+b+c)				227406.30	
			e) Overhead charges @ 20 % on (a+b+c+d)				183303.26	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				109981.96	
			Cost for 120 cum = a+b+c+d+e+f				1209801.52	
			Rate per cum = (a+b+c+d+e+f)/120				10081.68	
						say	<u>10082.00</u>	
14.1E Case II		(iii)	For cast-in-situ box girder, segment construction and balanced cantilever, 38-58 per cent of cost of concrete.					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				689110.00	
			d) Formwork and staging 38 per cent of (a+b+c)				261861.80	
			e) Overhead charges @ 20 % on (a+b+c+d)				190194.36	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				114116.62	
			Cost for 120 cum = a+b+c+d+e+f				1255282.78	
			Rate per cum = (a+b+c+d+e+f)/120				10460.69	
						say	<u>10461.00</u>	
14.1E Case II (iii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				689110.00	
			d) Formwork and staging 48 per cent of (a+b+c)				330772.80	
			e) Overhead charges @ 20 % on (a+b+c+d)				203976.56	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				122385.94	
			Cost for 120 cum = a+b+c+d+e+f				1346245.30	
			Rate per cum = (a+b+c+d+e+f)/120				11218.71	
						say	<u>11219.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1E Case II (iii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				689110.00	
			d) Formwork and staging 58 per cent of (a+b+c)				399683.80	
			e) Overhead charges @ 20 % on (a+b+c+d)				217758.76	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				130655.26	
			Cost for 120 cum = a+b+c+d+e+f				1437207.82	
			Rate per cum = (a+b+c+d+e+f)/120				11976.73	
						say	<b>11977.00</b>	
14.1F		F	PSC Grade M-45					
			<b>Unit = 1 cum</b>					
			<b>Taking output = 120 cum</b>					
			a) Material					
			Cement	tonne	55.80	8120.00	453096.00	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			Admixture @ 0.4 per cent of cement	kg	223.20	55.00	12276.00	M-180
			b) Labour					
			Mate	day	0.94	300.00	282.00	L-12
			Mason	day	3.50	400.00	1400.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1016.00	15240.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	Lead =0 km & P&M-050
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>724138.00</b>			
			<b>For formwork and staging add the following:</b>					
14.1F		(i)	For solid slab/voided slab super-structure, 16-26 per cent of cost of concrete (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				724138.00	
			d) Formwork and staging 16 per cent of (a+b+c)				115862.08	
			e) Overhead charges @ 20 % on (a+b+c+d)				168000.02	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				100800.01	
			Cost for 120 cum = a+b+c+d+e+f				1108800.11	
			Rate per cum = (a+b+c+d+e+f)/120				9240.00	
						say	<b>9240.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1F (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				724138.00	
			d) Formwork and staging 21 per cent of (a+b+c)				152068.98	
			e) Overhead charges @ 20 % on (a+b+c+d)				175241.40	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				105144.84	
			Cost for 120 cum = a+b+c+d+e+f				1156593.21	
			Rate per cum = (a+b+c+d+e+f)/120				9638.28	
						say	<u>9638.00</u>	
14.1F (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				724138.00	
			d) Formwork and staging 26 per cent of (a+b+c)				188275.88	
			e) Overhead charges @ 20 % on (a+b+c+d)				182482.78	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				109489.67	
			Cost for 120 cum = a+b+c+d+e+f				1204386.32	
			Rate per cum = (a+b+c+d+e+f)/120				10036.55	
						say	<u>10037.00</u>	
14.1F		(ii)	For T-beam & slab including launching of precast girders by launching truss upto 40 m span, 21-31 per cent of cost of concrete.					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				724138.00	
			d) Formwork and staging 21 per cent of (a+b+c)				152068.98	
			e) Overhead charges @ 20 % on (a+b+c+d)				175241.40	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				105144.84	
			Cost for 120 cum = a+b+c+d+e+f				1156593.21	
			Rate per cum = (a+b+c+d+e+f)/120				9638.28	
						say	<u>9638.00</u>	
14.1F (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				724138.00	
			d) Formwork and staging 26 per cent of (a+b+c)				188275.88	
			e) Overhead charges @ 20 % on (a+b+c+d)				182482.78	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				109489.67	
			Cost for 120 cum = a+b+c+d+e+f				1204386.32	
			Rate per cum = (a+b+c+d+e+f)/120				10036.55	
						say	<u>10037.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1F (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				724138.00	
			d) Formwork and staging 31 per cent of (a+b+c)				224482.78	
			e) Overhead charges @ 20 % on (a+b+c+d)				189724.16	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				113834.49	
			Cost for 120 cum = a+b+c+d+e+f				1252179.43	
			Rate per cum = (a+b+c+d+e+f)/120				10434.83	
						say	<u>10435.00</u>	
14.1F		(iii)	For cast-in-situ box girder, segmental construction and balanced cantilever, 36-56 per cent of cost of concrete.					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				724138.00	
			d) Formwork and staging 36 per cent of (a+b+c)				260689.68	
			e) Overhead charges @ 20 % on (a+b+c+d)				196965.54	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				118179.32	
			Cost for 120 cum = a+b+c+d+e+f				1299972.54	
			Rate per cum = (a+b+c+d+e+f)/120				10833.10	
						say	<u>10833.00</u>	
14.1F (iii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				724138.00	
			d) Formwork and staging 46 per cent of (a+b+c)				333103.48	
			e) Overhead charges @ 20 % on (a+b+c+d)				211448.30	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				126868.98	
			Cost for 120 cum = a+b+c+d+e+f				1395558.75	
			Rate per cum = (a+b+c+d+e+f)/120				11629.66	
						say	<u>11630.00</u>	
14.1F (iii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				724138.00	
			d) Formwork and staging 56 per cent of (a+b+c)				405517.28	
			e) Overhead charges @ 20 % on (a+b+c+d)				225931.06	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				135558.63	
			Cost for 120 cum = a+b+c+d+e+f				1491144.97	
			Rate per cum = (a+b+c+d+e+f)/120				12426.21	
						say	<u>12426.00</u>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1		G	PSC Grade M-50					
			<i>Unit = 1 cum</i>					
			<i>Taking output = 120 cum</i>					
			<b>a) Material</b>					
			Cement	tonne	58.80	8120.00	477456.00	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			Admixture @ 0.4 per cent of cement	kg	235.20	55.00	12936.00	M-180
			<b>b) Labour</b>					
			Mate	day	0.94	300.00	282.00	L-12
			Mason	day	3.50	400.00	1400.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1016.00	15240.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	Lead =0 km & P&M-050
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>749158.00</b>			
			<b>For formwork and staging add the following:</b>					
14.1G		(i)	<b>For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55 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				749158.00	
			<b>d) Formwork and staging 35 per cent of (a+b+c)</b>				262205.30	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				202272.66	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				121363.60	
			Cost for 120 cum = a+b+c+d+e+f				1334999.56	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				11125.00	
						<b>say</b>	<b>11125.00</b>	
14.1G		(q)	<b>Height 5m to 10m</b>					
(i)			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				749158.00	
			<b>d) Formwork and staging 45 per cent of (a+b+c)</b>				337121.10	
			<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				217255.82	
			<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				130353.49	
			Cost for 120 cum = a+b+c+d+e+f				1433888.41	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				11949.07	
						<b>say</b>	<b>11949.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1G (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				749158.00	
			d) Formwork and staging 55 per cent of (a+b+c)				412036.90	
			e) Overhead charges @ 20 % on (a+b+c+d)				232238.98	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				139343.39	
			Cost for 120 cum = a+b+c+d+e+f				1532777.27	
			Rate per cum = (a+b+c+d+e+f)/120				12773.14	
						say	<b>12773.00</b>	
14.1		H	PSC Grade M- 55					
			<b>Unit = 1 cum</b>					
			<b>Taking output = 120 cum</b>					
			a) Material					
			Cement	tonne	63.50	8120.00	515620.00	M-081
			Coarse sand	cum	54.00	540.00	29160.00	M-004
			20 mm Aggregate	cum	64.80	1600.00	103680.00	M-053
			10 mm Aggregate	cum	43.20	1750.00	75600.00	M-051
			Admixture @ 0.4 per cent of cement	kg	254.00	55.00	13970.00	M-180
			b) Labour					
			Mate	day	0.94	300.00	282.00	L-12
			Mason	day	3.50	400.00	1400.00	L-11
			Mazdoor	day	20.00	250.00	5000.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2440.00	14640.00	P&M-002
			Generator 100 KVA	hour	6.00	762.00	4572.00	P&M-080
			Loader	hour	6.00	1253.00	7518.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1016.00	15240.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	0.00	0.00	Lead =0 km & P&M-050
			Concrete Pump	hour	6.00	279.00	1674.00	P&M-007
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>			<b>788356.00</b>		
			For formwork and staging add the following:					
14.1H		(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55 per cent of cost of concrete					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				788356.00	
			d) Formwork and staging 35 per cent of (a+b+c)				275924.60	
			e) Overhead charges @ 20 % on (a+b+c+d)				212856.12	
			f) Contractor's profit @ 10 % on (a+b+c+d+e)				127713.67	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 120 cum = a+b+c+d+e+f				1404850.39	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				11707.09	
					<b>say</b>	<b><u>11707.00</u></b>	
14.1H (i)	(q)	<b>Height 5m to 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				788356.00	
		<b>d) Formwork and staging 45 per cent of (a+b+c)</b>				354760.20	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				228623.24	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				137173.94	
		Cost for 120 cum = a+b+c+d+e+f				1508913.38	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				12574.28	
					<b>say</b>	<b><u>12574.00</u></b>	
14.1H (i)	(r)	<b>Height above 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				788356.00	
		<b>d) Formwork and staging 55 per cent of (a+b+c)</b>				433595.80	
		<b>e) Overhead charges @ 20 % on (a+b+c+d)</b>				244390.36	
		<b>f) Contractor's profit @ 10 % on (a+b+c+d+e)</b>				146634.22	
		Cost for 120 cum = a+b+c+d+e+f				1612976.38	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				13441.47	
					<b>say</b>	<b><u>13441.00</u></b>	
		<b>Note</b>					
		1. Where ever concrete is carried out using batching plant, transit mixer, concrete pump, admixers conforming IS: 9103 @ 0.4 per cent of weight of cement may be added for achieving desired slump of concrete.					
		2. Cement provided for various components of the super structure is for estimating purpose only. Actual quantity of cement will be as per approved mix design. Similarly, the provision for coarse and fine aggregates is for estimating purpose and the exact quantity shall be as per the mix design.					
		3. The items like needle and surface vibrators are part of minor T & P which is already covered under the overhead charges. As such these items have not been added separately in the rate analysis.					
14.2	1600	<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	53650.00	56332.50	M-082
		Binding wire	Kg	8.00	80.00	640.00	M-072

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Labour for cutting, bending, tying and placing in position</b>					
		Mate	day	0.44	300.00	132.00	L-12
		Blacksmith	day	3.00	400.00	1200.00	L-02
		Mazdoor	day	8.00	250.00	2000.00	L-13
		<b>Basic Cost of Labour &amp; Material (a+b)</b>		<b>60305.00</b>			
		<b>c) Overhead charges @ 20 % on (a+b)</b>				12060.90	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				7236.54	
		<b>Rate per MT = a+b+c+d</b>				79601.94	
					<b>say</b>	<b>79602.00</b>	
14.3	1800	<b>High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications</b>					
		<b>Unit = 1 MT</b>					
		<b>Taking output = 0.377 MT</b>					
		Details of cost for 12T13 strand 40 m long cable (weight = 0.377 MT)					
		<b>a) Material</b>					
		H.T. Strand @ 9.42 kg/m including 2 per cent for wastage and extra length for jacking	tonne	0.39	63800.00	24563.00	M-119
		Sheathing duct ID 66 mm along with 5 per cent extra length 40 x 1.05 = 42 m.	metre	42.00	99.00	4158.00	M-165
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	2.00	4180.00	8360.00	M-187
		Cement for grouting including 3 per cent wastage @ 3.00 kg/m = 3 x 1.03 x 40 = 123.60 kg (say, = 125 kg)	tonne	0.125	8120.00	1015.00	M-081
		Add 0.50 per cent cost of material for Spacers, Insulation tape and miscellaneous items				1904.80	
		<b>b) Labour</b>					
		<b>i) For making and fixing cables, anchorages</b>					
		Mate	day	0.16	300.00	48.00	L-12
		Blacksmith	day	1.00	400.00	400.00	L-02
		Mazdoor	day	3.00	250.00	750.00	L-13
		<b>ii) For prestressing</b>					
		Mate/Supervisor	day	0.05	300.00	15.00	L-12
		Prestressing operator / Fitter	day	0.25	400.00	100.00	L-08
		Mazdoor	day	1.00	250.00	250.00	L-13
		<b>iii) For grouting</b>					
		Mate/Supervisor	day	0.05	300.00	15.00	L-12
		Mason	day	0.25	400.00	100.00	L-11
		Mazdoor	day	1.00	250.00	250.00	L-13
		<b>c) Machinery</b>					
		Stressing jack with pump	hour	2.50	141.00	352.50	P&M-040
		Grouting pump with agitator	hour	1.00	165.00	165.00	M-111
		Generator 33 KVA.	hour	3.50	407.00	1424.50	P&M-079

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 20 % on (a+b+c)				774.00	
		e) Contractor's profit @ 10 % on (a+b+c+d)				464.40	
		Cost for 0.377 MT (a+b+c+d+e)				45109.20	
		Rate per MT = (a+b+c+d+e)/0.377				119653.05	
					say	<u>119653.00</u>	
		Note					
		Cost of HT steel has been taken for delivery at site. Hence carriage has not been considered.					
14.4	2702	Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications					
		Unit = 1 cum					
		Taking output = 1 cum					
		a) Material					
		Cement concrete M30 Grade Refer relevant item of concrete in Item 14.1 excluding formwork	cum	1.00	5457.00	5457.00	Item 14.1(C)
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.075	60305.00	4522.88	Item 14.2 A
		b) Labour					
		Mazdoor for cleaning deck slab concrete surface.	day	0.15	250.00	37.50	L-13
		c) Overhead charges @ 20 % on (a+b)				2003.48	
		d) Contractor's profit @ 10 % on (a+b+c)				1202.09	
		Rate per cum (a+b+c+d)				13222.94	
					say	<u>13223.00</u>	
14.5	515 & 2702	Mastic Asphalt					
		Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen 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.					
		Unit = sqm					
		Taking output = 72.46 sqm (2 tonnes)(0.869 cum) assuming a density of 2.3 tonnes/cum.					
		a) Labour					
		Mate	day	0.49	300.00	147.00	L-12
		Mazdoor	day	11.00	250.00	2750.00	L-13
		Mazdoor (Skilled)	day	1.25	400.00	500.00	L-15

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	0.06	389.00	23.34	P&M-031
		Air compressor 250 cfm	hour	0.06	516.00	30.96	P&M-001
		Mastic cooker 1 tonne capacity	hour	6.00	68.00	408.00	P&M-030
		Bitumen boiler 1500 litres capacity	hour	6.00	217.00	1302.00	P&M-005
		Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.00	427.00	427.00	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 CRRIL for a specific case)					
		i) Bitumen 80/100 or 60/70 or 30/40 @ 10.2 per cent by weight of mix. $2 \times 10.2/100 = 0.204$	tonne	0.204	48810.00	9957.24	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	560.00	218.40	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	11550.00	4158.00	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	1750.00	962.50	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	1045.00	37.62	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	48.81	51.25	M-074/1000
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				4194.66	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				2516.80	
		Cost for 72.46 sqm = a+b+c+d+e				27684.77	
		<b>Rate per sqm = (a+b+c+d+e)/72.46</b>				382.07	
					<b>say</b>	<b>382.00</b>	
		<b>Note</b>					
		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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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>					
		Cement concrete M30 Grade Refer relevant item of concrete in Item 14.1(C) by using batching plant, excluding formwork i.e. per cum basic cost (a+b+c)	cum	4.09	5457.00	22330.04	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.				1116.50	
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.87	60305.00	52163.83	Item 14.2 A
		Refer MoRTH SD / 202.					
		Add 5 per cent of (a) for handling and fixing of precast panels in position				3780.52	
		<b>b) Overhead charges @ 20 % on (a)</b>				15878.18	
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				9526.91	
		<b>Rate for 48 m (a+b+c)</b>				104795.97	
		<b>Rate per metre (a+b+c)/48</b>				2183.25	
					<b>say</b>	<b>2183.00</b>	
		<b>Note</b> 1.Quantities of material have been adopted from standard plans of MoRTH vide drawing no. SD/202.					
		2.48 m length is the total linear length adding both sides of 24 m span.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.7	2703, 1500, 1600 & 1700	Construction of RCC railing of M30 Grade in-situ with 20 mm nominal size aggregate, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specifications.					
		<b>Unit = 1 RM</b>					
		<b>Taking output = 2 x 24 m span = 48 m.</b>					
		<b>a) Material</b>					
		Cement concrete M30 Grade Refer relevant item of concrete in Item 14.1(C) by using batching plant, excluding formwork i.e. per cum basic cost (a+b+c)	cum	4.092	5457.00	22330.04	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 vehicle 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 12 per cent of above cost for form work.				2679.61	
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.87	60305.00	52163.83	Item 14.2 A
		refer MoRTH SD / 202.					
		<b>b) Overhead charges @ 20 % on (a)</b>				15434.69	
		<b>c) Contractor's profit @ 10 % on (a+b)</b>				9260.82	
		<b>Rate for 48 m (a+b+c)</b>				101868.99	
		<b>Rate per metre (a+b+c)/48</b>				2122.27	
					<b>say</b>	<b>2122.00</b>	
		<b>Note</b>					
		1. Quantities of material have been adopted from standard plans of MoRTH vide drawing no. SD/202.					
		2. 48 m length is the total linear length adding both sides of 24 m span.					
14.8	2703.2 & 1900	Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification					
		<b>Unit = 1 RM</b>					
		<b>Taking output = 2 x 50 m span = 100 m</b>					
		<b>a) Material:</b>					
		1) ISMC 100 = $2.806 \times 1.05 = 2.946$ MT	tonne	2.95	57210.00	168540.66	M-179
		2) MS Flat = $0.964 \times 1.05 = 1.012$ MT	tonne	1.01	57210.00	57896.52	M-179
		3) MS bars = $0.17 \times 1.05 = 0.180$ MT	tonne	0.18	57210.00	10297.80	M-179
		4) MS bolts, nuts and washers	tonne	0.15	100000.00	15000.00	M-130*1000
		Add @ 5 per cent of cost of material for painting one shop coat with red oxide primer and three coats of synthetic enamel paint and consumables to safeguard against weathering and corrosion.				12586.75	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add for cost of concrete for fixing vertical posts in the performed recess @ 1 per cent of cost of material.				2517.35	
		Add for electricity charges, welding and drilling equipment, electrodes and other consumables @ 1 per cent of cost of material.				2517.35	
		<b>b) Labour</b>					
		Mate	day	2.80	300.00	840.00	L-12
		Mazdoor (Skilled)	day	30.00	400.00	12000.00	L-15
		Mazdoor	day	40.00	250.00	10000.00	L-13
		<b>c) Overhead charges @ 20 % on (a+b)</b>				58439.29	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				35063.57	
		Cost for 100 m steel railing = a+b+c+d				385699.29	
		<b>Rate per metre (a+b+c+d)/100</b>				3856.99	
					<b>say</b>	<b>3857.00</b>	
14.9	2705	<b>Drainage Spouts complete as per drawing and Technical specification</b>					
		<b>Unit = 1 No.</b>					
		<b>Taking output = 1 No.</b>					
		<b>a) Material</b>					
		Corrosion resistant Structural steel including 5 per cent wastage	Kg	4.00	0.06	0.24	M-087/1000
		GI pipe 100mm dia	metre	6.00	31.00	186.00	M-056
		GI bolt 10 mm Dia	each	6.00	38.00	228.00	M-110
		Galvanised MS flat clamp	each	2.00	33.00	66.00	M-101
		<b>b) Labour</b>					
		<b>For fabrication</b>					
		Mate	day	0.02	300.00	6.00	L-12
		Skilled (Blacksmith, welder etc.)	day	0.02	400.00	8.00	L-02
		Mazdoor	day	0.02	250.00	5.00	L-13
		<b>For fixing in position</b>					
		Mate	day	0.01	300.00	3.00	L-12
		Mason	day	0.01	400.00	4.00	L-11
		Mazdoor	day	0.20	250.00	50.00	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.				27.81	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				116.81	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				70.09	
		<b>Rate per metre (a+b+c+d)</b>				770.95	
					<b>say</b>	<b>771.00</b>	
		<b>Note</b>					
		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.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.10	2700	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification					
		<b>Unit = 1 cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>Material</b>					
		Concrete, Rate as per item No. 12.8 (A) excluding formworks	cum	1.00	5873.00	5873.00	Item 12.8 (A)
		<b>Rate per cum</b>			<b>say</b>	<b>5873.00</b>	
14.11	1500,160 0,1700 & 2704	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification					
		<b>Unit = 1 cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Material</b>					
		Cement concrete M30 Grade Refer relevant item of concrete in item 12.8(G) by using batching plant, excluding formwork i.e. per cum basic cost (a+b+c) (Excluding OH & CP)	cum	1.00	5453.00	5453.00	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.				109.06	
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.05	60305.00	3015.25	Item 14.2 A
		<b>b) Overhead charges @ 20 % on (a)</b>				1715.46	
		<b>c) Contractor's profit @ 10 % on(a+b)</b>				1029.28	
		<b>Rate per cum (a+b+c)</b>				11322.05	
					<b>say</b>	<b>11322.00</b>	
		<b>Note</b> The grade of reinforced cement concrete may be adopted as M30 for severe conditions and M25 for moderate conditions.					
14.15	800	<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	800	<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 sqm.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = sqm</b>					
		<b>Taking output = 10 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.01	300.00	3.00	L-12
		Painter	day	0.25	400.00	100.00	L-18
		Mazdoor (Skilled)	day	0.25	400.00	100.00	L-15
		<b>b) Material</b>					
		Water based paint of approved quality for cement concrete surface	Litres	5.00	77.00	385.00	M-190
		<b>c) Overhead charges @ 20 % on (a+b)</b>				117.60	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				70.56	
		Cost for 10 sqm (a+b+c+d)				776.16	
		<b>Rate per sqm (a+b+c+d)/10</b>				77.62	
					<b>say</b>	<b>78.00</b>	
14.17	2604	<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.					
		<b>Unit = Running meter</b>					
		<b>Taking output = 12 m</b>					
		<b>a) Labour</b>					
		Mate	day	0.02	300.00	6.00	L-12
		Mazdoor	day	0.40	250.00	100.00	L-13
		Mazdoor (Skilled)	day	0.20	400.00	80.00	L-15
		<b>b) Material</b>					
		Galvanised M.S plate 200 mm wide,12 mm thick @ 94.20 kg/sqm including 5 per cent wastage	kg	237.50	53.93	12808.61	M-060/1000
		Add 1 per cent of cost of steel plate cutting, welding consumables and galvanised nails.				128.09	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				2624.54	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1574.72	
		Cost for 12 m = (a+b+c+d)				17321.96	
		<b>Rate per m = (a+b+c+d)/12</b>				1443.50	
					<b>say</b>	<b>1443.00</b>	
		<b>Note</b>					
		Guidelines laid down vide the MoRTH circular No. RW/NH-34059/1/96-S&R dated 30.11.2000 and subsequent corrigendum dated 25.01.2001 may be referred for expansion joints.					
14.18	2605	<b>Filler joint</b>					
		(i) Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.					
		<b>Unit = Running meter</b>					
		<b>Taking output = 12 m</b>					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>a) Labour</b>					
		Cutting, bending, carrying & fixing etc.					
		Mate	day	0.04	300.00	12.00	L-12
		Mazdoor	day	0.50	250.00	125.00	L-13
		Mazdoor (Skilled)	day	0.50	400.00	200.00	L-15
		<b>b) Material</b>					
		Copper plate - 12m long x 250 mm wide	kg	55.00	660.00	36300.00	M-086
		Area = 12 x 0.25 = 3 sqm					
		Weight = 3 x 0.002 x 8900 = 53.4 kg					
		Wastage @ 2.5 per cent = 1.33 kg/54.73 kg say = 55 kg.					
		<b>c) Overhead charges @ 20 % on (a+b)</b>				7327.40	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				4396.44	
		Cost for 12 m = (a+b+c+d)				48360.84	
		<b>Rate per m = (a+b+c+d)/12</b>				4030.07	
					<b>say</b>	<b>4030.00</b>	
14.18	(ii)	<b>Providing &amp; fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing &amp; Technical Specification.</b>					
		<b>Unit = Running meter</b>					
		<b>Taking output = 12 m</b>					
		<b>a) Labour</b>					
		For carrying, placing & fixing.					
		Mate	day	0.008	300.00	2.40	L-12
		Mazdoor	day	0.10	250.00	25.00	L-13
		Mazdoor (Skilled)	day	0.10	400.00	40.00	L-15
		<b>b) Material</b>					
		20 mm thick compressible fibre board 12 m long x 25 cm deep.	sqm	3.00	682.00	2046.00	M-084
		Area = 12 x 0.25 = 3 sqm					
		<b>c) Overhead charges @ 20 % on (a+b)</b>				422.68	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				253.61	
		Cost for 12 m = (a+b+c+d)				2789.69	
		<b>Rate per m = (a+b+c+d)/12</b>				232.47	
					<b>say</b>	<b>232.00</b>	
14.18	(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>					
		<b>Unit = Running meter</b>					
		<b>Taking output = 12 m</b>					
		<b>a) Labour</b>					
		Mate	day	0.01	300.00	3.00	L-12
		Mazdoor	day	0.20	250.00	50.00	L-13
		Mazdoor (Skilled)	day	0.10	400.00	40.00	L-15
		<b>b) Material</b>					
		Premoulded joint filler 12 m long, 20 mm thick and 300 mm deep.	sqm	3.60	550.00	1980.00	M-141
		<b>c) Overhead charges @ 20 % on (a+b)</b>				414.60	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				248.76	
		Cost for 12 m = (a+b+c+d)				2736.36	
		<b>Rate per m = (a+b+c+d)/12</b>				228.03	
					<b>say</b>	<b>228.00</b>	

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.18		(iv)	Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6 per cent bitumen by weight					
			<b>Unit = Running meter</b>					
			<b>Taking output = 12 m</b>					
			12m long x 100 mm wide x 10mm deep recess					
			<b>a) Labour</b>					
			Mate	day	0.02	300.00	6.00	L-12
			Mazdoor	day	0.50	250.00	125.00	L-13
			Mazdoor (Skilled)	day	0.10	400.00	40.00	L-15
			<b>b) Material</b>					
			Sand	cum	0.012	540.00	6.48	M-005
			Volume 12 x 0.1 x 0.01 = 0.012 cum					
			Weight 0.012 x 1400 = 16.8kg					
			Bitumen	cum	0.001	48810.00	48.81	M-074
			16.8 x 0.06 = 1 kg					
			<b>c) Overhead charges @ 20 % on (a+b)</b>				45.26	
			<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				27.15	
			Cost for 12 m = (a+b+c+d)				298.70	
			<b>Rate per m = (a+b+c+d)/12</b>				24.89	
							<b>say</b>	<b>25.00</b>
		<b>Note</b>	For arriving at the final rate of filler joints per m length and per cm depth of joint filling compound, the rates at Sl. No. i), ii), iii) & iv) shall be added					
14.19	2600		<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.					
			<b>Unit = Running meter</b>					
			<b>Taking output = 12 m</b>					
			<b>a) Labour</b>					
			Mate	day	0.052	300.00	15.60	L-12
			Mazdoor	day	1.00	250.00	250.00	L-13
			Mazdoor (Skilled)	day	0.30	400.00	120.00	L-15
			<b>b) Material</b>					
			Crushed stone aggregate 12.5 mm nominal size	cum	0.75	1700.00	1275.00	M-052
			Polymer modified bitumen	kg	77.50	44.38	3439.37	M-078/ 1000
		2.4	Galvanised structural steel plate 200 mm wide, 6 mm thick, 12 m long (2.4 sqm) @ 47.10 kg/sqm including 5 per cent wastage	kg	113.00	198.00	22374.00	M-103
			Add 1 per cent for welding and foam caulking/backer rod and other incidentals.				274.74	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Mastic cooker 1 tonne capacity	hour	1.00	68.00	68.00	P&M-030
		Smooth 3-wheeled steel roller 8-10 capacity	hour	0.50	504.00	252.00	P&M-044
		<b>d) Overhead charges @ 20 % on (a+b+c)</b>				5613.74	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				3368.25	
		Cost for 12 m asphalt plug joint = (a+b+c+d+e)				37050.70	
		<b>Rate per m = (a+b+c+d+e)/12</b>				3087.56	
					<b>say</b>	<b>3088.00</b>	
		<b>Note</b> The nominal size of aggregates shall be 12.5 mm for depth of joint upto 75 mm and 20 mm for joints of depth more than 75 mm.					
14.20	2606	<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.					
		<b>Unit = Running meter</b>					
		<b>Taking output = 12 m</b>					
		<b>a) Labour</b>					
		Mate	day	0.06	300.00	18.00	L-12
		Mazdoor	day	1.00	250.00	250.00	L-13
		Mazdoor (Skilled)	day	0.50	400.00	200.00	L-15
		<b>b) Material</b>					
		Supply of elastomeric slab seal expansion joint assembly manufactured by using chloroprene, elastomer for elastomeric slab unit conforming to clause 915.1 of IRC: 83 (part II), complete as per approved drawings and standard specification conforming to clause 2606 of MoRTH Specification	metre	12.00	9900.00	118800.00	M-093
		Add 5 per cent of cost of material for anchorage reinforcement, welding and other incidentals.				5940.00	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				25041.60	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				15024.96	
		Cost for 12 m = (a+b+c+d)				165274.56	
		<b>Rate per m = (a+b+c+d)/12</b>				13772.88	
					<b>say</b>	<b>13773.00</b>	
14.21	2600	<b>Compression Seal Joint</b>					
		Providing and laying of compression seal joint consisting of steel armoured nosing at two edges of the joint gap suitably anchored to the deck concrete and a preformed chloroprene elastomer or closed cell foam joint sealer compressed and fixed into the joint gap with special adhesive binder to cater for a horizontal movement upto 40 mm and vertical movement of 3 mm.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Unit = Running meter</b>					
		<b>Taking output = 12 m</b>					
		<b>a) Labour</b>					
		Mate	day	0.036	300.00	10.80	L-12
		Mazdoor	day	0.60	250.00	150.00	L-13
		Mazdoor (Skilled)	day	0.30	400.00	120.00	L-15
		<b>b) Material</b>					
		1. Galvanised angle sections 100mm x 100mm of 12mm thickness weldable structural steel as per IS: 2062, 2 nos. of 12 m length each @ 17.7 kg/m and 5 per cent wastage.	kg	446.00	198.00	88308.00	M-103
		Add 5 per cent of cost of above for structural steel for anchorage, welding and other incidentals.				4429.44	
		Preformed continuous chloroprene elastomer or closed cell foam sealing element with high tear strength, vulcanised in a single operation for the full length of a joint to ensure water tightness.	metre	12.00	4400.00	52800.00	M-143
		Add 1 per cent of cost of sealing element for lubricant-cum-adhesive and other consumables.				528.00	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				29269.25	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				17561.55	
		Cost for 12 m = (a+b+c+d)				193177.04	
		<b>Rate per m = (a+b+c+d)/12</b>				16098.09	
					<b>say</b>	<b>16098.00</b>	
		<b>Note</b>					
		1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
		3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.					
14.22	2607	<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.					
		<b>Unit = Running meter</b>					
		<b>Taking output = 12 m</b>					
		<b>a) Labour</b>					
		Mate	day	0.05	300.00	15.00	L-12
		Mazdoor	day	1.00	250.00	250.00	L-13
		Mazdoor (Skilled)	day	0.25	400.00	100.00	L-15

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<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	12100.00	145200.00	M-178
		Add 5 per cent of cost of material for anchorage reinforcement, welding and other incidentals.				7278.25	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				30568.65	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				18341.19	
		Cost for 12 m = (a+b+c+d)				201753.09	
		<b>Rate per m = (a+b+c+d)/12</b>				16812.76	
					<b>say</b>	<b>16813.00</b>	
		<b>Note</b>					
		1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
14.23	2600	<b>Modular Strip / Box Seal Joint</b>					
		Providing and laying of a modular strip Box seal expansion joint including anchorage catering to a horizontal movement beyond 70 mm and upto 140mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.					
		<b>Unit = Running meter</b>					
		<b>Taking output = 12 m</b>					
		<b>a) Labour</b>					
		Mate	day	0.056	300.00	16.80	L-12
		Mazdoor	day	1.00	250.00	250.00	L-13
		Mazdoor (Skilled)	day	0.40	400.00	160.00	L-15
		<b>b) Material</b>					
		Supply of a modular strip/box seal joint assembly comprising of edge beams, central beam, 2 modules chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative.	metre	12.00	209000.00	2508000.00	M-127
		<b>c) Overhead charges @ 20 % on (a+b)</b>				501685.36	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				301011.22	
		Cost for 12 m Modular strip/box seal joint = (a+b+c+d)				3311123.38	
		<b>Rate per m = (a+b+c+d)/12</b>				275926.95	
					<b>say</b>	<b>275927.00</b>	
		<b>Note</b>					
		1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
		3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.					
14.24	2600	<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.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		<b>a) Labour</b>					
		Mate	day	0.07	300.00	21.00	L-12
		Mazdoor	day	1.25	250.00	312.50	L-13
		Mazdoor (Skilled)	day	0.50	400.00	200.00	L-15
		<b>b) Material</b>					
		Supply of a modular box/box seal joint assembly containing 3 modules/cells and comprising of edge beams, two central beams, chlorprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative.	metre	12.00	231000.00	2772000.00	M-128
		<b>c) Overhead charges @ 20 % on (a+b)</b>				554506.70	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				332704.02	
		Cost for 12 m Modular strip/box seal joint = (a+b+c+d)				3659744.22	
		<b>Rate per m = (a+b+c+d)/12</b>				304978.69	
					<b>say</b>	<b><u>304979.00</u></b>	
		<b>Note</b> 1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
		3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.					

## Chapter – 15

### PROTECTION WORKS

**Preamble:**

- 1 Three types of aprons as under have been catered for:
  - a. Boulder apron laid dry
  - b. Boulder apron laid in wire crates
  - c. Apron laid in cement concrete blocks of M 15 grade
- 2 A toe wall for toe protection of pitching can be either in random rubble masonry or in nominal mix cement concrete M 10, or in brick masonry. Depending upon the design, the rates may be adopted under respective clauses.
- 3 Flooring has been proposed in dry rubble stone, rubble stone laid in cement mortar 1:3, cement concrete blocks M 15 and brick on edge laid in cement mortar (CM) 1:3.
- 4 Curtain walls proposed are of the following types:
  - b. Coursed rubble stone masonry (1st sort) is CM 1:3
  - c. Cement concrete M-15 grade
- 5 The rate analysis for gabion structures comprising of stone boulders laid in wire crates have been included. Such structures are suited as retaining structures and for erosion control in river training works especially for situations where some settlement of foundation is anticipated. These structures can adjust in minor settlements, being flexible structures, without losing their functional requirement.

**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.					
	<b>A</b>	<b>Boulder Laid Dry Without Wire Crates.</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		<b>a) Material</b>					
		Stone	cum	1.00	435.00	435.00	M-003
		Stone Spalls	cum	0.20	400.00	80.00	M-008
		<b>b) Labour</b>					
		Mate	day	0.04	300.00	12.00	L-12
		Mason	day	0.35	400.00	140.00	L-11
		Mazdoor *	day	0.75	250.00	187.50	L-13
		<b>c) Overhead charges @ 20 % on (a+b)</b>				170.90	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				102.54	
		<b>Rate per cum = (a+b+c+d)</b>				1127.94	
					<b>say</b>	<b>1128.00</b>	
		* Including excavation for trimming for preparation of bed.					
	<b>Note</b>	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>					
		<b>a) Material</b>					
		4mm GI wire crates woven in mesh size of 100 mm x 100 mm.	sqm	22.00	170.00	3740.00	M-102
		Stone	cum	5.63	435.00	2449.05	M-003
		Stone Spalls	cum	1.13	400.00	452.00	M-008
		<b>b) Labour</b>					
		Mate	day	0.18	300.00	54.00	L-12
		Mazdoor (Skilled)	day	1.50	400.00	600.00	L-15
		Mazdoor	day	*3.00	250.00	750.00	L-13
		<b>c) Overhead charges @ 20 % on (a+b)</b>				1609.00	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				965.41	
		Cost for 5.63 cum = a+b+c+d				10619.47	
		<b>Rate per cum = (a+b+c+d)/5.63</b>				1886.23	
					<b>say</b>	<b>1886.00</b>	
		* Including excavation for trimming for preparation of bed.					
	<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.					
15.3	2503	<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.					
		<i>Unit = cum</i>					
		<i>Taking out put = 1 cum</i>					
		Concrete Grade M15 Rate as per item No. 12.8 (A) including OH & CP	cum	1.00	6107.00	6107.00	Item 12.8 (A)



Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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>					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Cement mortar 1:3 (Rate as in Item 12.6 sub-analysis) excluding OH & CP	cum	0.33	4945.00	1631.85	Item 12.6 (A)
		b) Add for cement concrete bedding (M15 Nominal mix) vide Item 12.8 (A) excluding OH & CP . Quantity shall be adopted as per design ( Assume Rubble stone Flooring thickness 300mm and cement concrete bedding thickness 100mm)	cum	0.33	4449.00	1468.17	Item 12.8 (A)
		Add 1 per cent of cost to account for excavation for preparation of bed.				31.00	
		c) Material					
		Stone	cum	1.00	435.00	435.00	M-003
		Stone Spalls	cum	0.20	400.00	80.00	M-008
		d) Labour					
		Mate	day	0.08	300.00	24.00	L-12
		Mason	day	0.50	400.00	200.00	L-11
		Mazdoor (for laying stones, filling of quarry spalls)	day	1.50	250.00	375.00	L-13
		e) Overhead charges @ 20 % on (a+c+d)				549.17	
		f) Contractor's profit @ 10 % on (a+c+d+e)				329.50	
		Rate per cum = (a+b+c+d+e+f)				5123.69	
						<b>say</b>	<b>5124.00</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	6107.00	6107.00	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	6107.00	2015.31	Item 12.8 (A)
		Add 1 per cent of cost to account for excavation for preparation of bed.				81.22	
		Rate per cum				8203.53	
						<b>say</b>	<b>8204.00</b>
15.9	2506	<b>Dry Rubble Flooring</b>					
		Construction of dry rubble flooring at cross drainage works for relatively less important works.					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Stone	cum	1.00	435.00	435.00	M-003
		Stone Spalls	cum	0.20	400.00	80.00	M-008
		b) Labour					
		Mate	day	0.10	300.00	30.00	L-12
		Mason	day	0.50	400.00	200.00	L-11
		mazdoor	day	1.50	250.00	375.00	L-13
		Add 1 per cent of (b) for trimming and preparation of base.				6.05	
		c) Overhead charges @ 20 % on (a+b)				225.21	
		d) Contractor's profit @ 10 % on (a+b+c)				135.13	
		Rate per cum = (a+b+c+d)				1486.39	
						<b>say</b>	<b>1486.00</b>

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
15.10	2507.2	Curtain wall complete as per drawing and Technical specification					
		<b>A</b> Stone masonry in cement mortar (1:3)					
		Coursed rubble masonry (1st sort)	cum	1.00	4267.00	4267.00	Item 12.7 (A)
		Rate same as per item No. 12.7 (A) including OH & CP					
		Rate per cum			say	<u>4267.00</u>	
		or					
15.10		<b>B</b> Cement concrete Grade M15					
		Concrete Grade M15 Rate as per item No. 12.8 (A) including OH & CP	cum	1.00	6107.00	6107.00	Item 12.8 (A)
		Rate per cum			say	<u>6107.00</u>	
		<b>Note</b> Other items like excavation for foundation, filling behind wall, filter media, weep holes etc. shall be added separately as per approved design.					
15.11	2507.2	Flexible Apron :Construction of flexible apron 1 m thick comprising of loose stone boulders weighing not less than 40 kg beyond curtain wall.					
		<i>Unit = cum</i>					
		<i>Taking Output = 1 cum</i>					
		<b>a) Material</b>					
		Stone	cum	1.00	435.00	435.00	M-003
		Stone Spalls	cum	0.20	400.00	80.00	M-008
		<b>b) Labour</b>					
		Mate	day	0.05	300.00	15.00	L-12
		Mason	day	0.25	400.00	100.00	L-11
		Mazdoor	day	1.00	250.00	250.00	L-13
		Add 1 per cent of cost of (a+b) for trimming and preparation of bed.				8.80	
		<b>c) Overhead charges @ 20 % on (a+b)</b>				177.76	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				106.66	
		Rate per cum = (a+b+c+d)				1173.22	
					say	<u>1173.00</u>	
15.12	2503.3	<b>Gabian Structure for Retaining Earth</b>					
		Providing and construction of a gabian structure for retaining earth with segments of wire crates of size 7 m x 3 m x 0.6 m each divided into 1.5 m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be tied with 4 mm galvanised steel wire					
		<i>Unit = cum</i>					
		<i>Taking output = 7 x 3 x 0.6 = 12.60 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.28	300.00	84.00	L-12
		Mazdoor	day	5.00	250.00	1250.00	L-13
		Mazdoor (Skilled)	day	2.00	400.00	800.00	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.	sqm	61.00	170.00	10370.00	M-102
		Stone boulders with least dimension of 200 mm	cum	12.60	435.00	5481.00	M-003
		Stone spalls of minimum size 25 mm	cum	2.52	400.00	1008.00	M-008
		<b>c) Overhead charges @ 20 % on (a+b)</b>				3798.60	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				2279.16	
		Cost for 12.60 cum (a+b+c+d)				25070.76	
		<b>Rate per cum (a+b+c+d)/12.60</b>				1989.74	
					<b>say</b>	<b><u>1990.00</u></b>	
		<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.					
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.					
		<b>Unit = cum</b>					
		<b>Taking output = 2 x 1 x 0.3 x 10 Nos. = 6.00 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.14	300.00	42.00	L-12
		Mazdoor	day	2.50	250.00	625.00	L-13
		Mazdoor (Skilled)	day	1.00	400.00	400.00	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	170.00	11050.00	M-102
		Stone boulders with least dimension of 200 mm	cum	6.00	435.00	2610.00	M-003
		Stone spalls of minimum size 25 mm	cum	1.20	400.00	480.00	M-008
		<b>c) Overhead charges @ 20 % on (a+b)</b>				3041.40	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				1824.84	
		Cost for 6.00 cum (a+b+c+d)				20073.24	
		<b>Rate per cum (a+b+c+d)/6.00</b>				3345.54	
					<b>say</b>	<b><u>3346.00</u></b>	
		<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.					

## Chapter – 16

### REPAIR AND REHABILITATION

#### Preamble:

- 1 Removal of cement concrete wearing coat and asphaltic wearing coat has been proposed with pneumatic breakers.
- 2 The rate for external prestressing has been analysed for three different spans of 25, 50 and 100 m.
- 3 Sealing of cracks has been proposed with cement grout, cement mortar (1:1) grout and epoxy grout by injecting with grout pump through nipples.
- 4 Bonding of new concrete with old concrete is proposed with epoxy resin.
- 5 The repair and replacement of following structures has been included -
  - a) Bridge Bearings
  - b) Expansion Joints
  - c) Concrete Railing
  - d) Mild Steel Railing
  - e) Crash Barrier

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REPAIR AND REHABILITATION								
Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
16.1	2809		Removal of existing cement concrete wearing coat including its disposal complete as per Technical Specification without causing any detrimental effect to any part of the bridge structure and removal of dismantled material with all lifts and lead upto 1000 m					
			<b>Unit = Sq m ( Thickness 75 mm)</b>					
			<b>Taking output = 10 sqm</b>					
			a) Labour					
			Mate	day	0.06	300.00	18.00	L-12
			Mazdoor	day	1.00	250.00	250.00	L-13
			b) Machinery					
			Air Compressor 250 cfm with pneumatic breaker/jack hammer along with accessories.	hour	1.00	516.00	516.00	P&M-001
			Tractor-trolley.	hour	0.50	427.00	213.50	P&M-053
			c) Overhead charges @ 10 % on (a+b)				99.75	
			d) Contractor's profit @ 10 % on (a+b+c)				109.73	
			Cost for 10 sqm = (a+d+c+d)				1206.98	
			Rate per sqm = (a+b+c+d)/10				120.70	
						say	121.00	
16.2	2809		Removal of existing asphaltic wearing coat comprising of 50 mm thick asphaltic concert laid over 12 mm thick mastic asphalt including disposal with all lift and lead upto 1000 m.					
			<b>Unit = Sq m</b>					
			<b>Taking output = 10 sqm</b>					
			a) Labour					
			Mate	day	0.03	300.00	9.00	L-12
			Mazdoor	day	0.75	250.00	187.50	L-13
			b) Machinery					
			Air Compressor 250 cfm with pneumatic breaker.	hour	0.75	516.00	387.00	P&M-001
			Tractor-trolley.	hour	0.40	427.00	170.80	P&M-053
			c) Overhead charges @ 10 % on (a+b)				75.43	
			d) Contractor's profit @ 10 % on (a+b+c)				82.97	
			Cost for 10 sqm = (a+d+c+d)				912.70	
			Rate per sqm = (a+b+c+d)/10				91.27	
						say	91.00	
16.3	2807		Guniting concrete surface with cement mortar applied with compressor after cleaning surface and spraying with epoxy complete as per Technical Specification					
			<b>Unit = Sq m</b>					
			<b>Taking output = 1 sqm</b>					
			Assuming thickness 25 mm					
			a) Material					
			Cement	kg	16.00	8.12	129.92	M-081/1000
			Graded sand	cum	0.04	540.00	21.60	M-005
			Wire mesh 50mm x 50mm size of 3mm wire	kg	2.00	145.00	290.00	M-192
			Epoxy	kg	0.67	220.00	147.40	M-095
			Accelerator compound for guniting @ 4 per cent of weight of cement	kg	0.64	55.00	35.20	M-180
			Add 2 per cent of cost of material for miscellaneous consumables like nozzles, wire brush, cotton waste etc.				12.48	
			b) Labour					
			Mate	day	0.01	300.00	3.00	L-12
			Mason	day	0.04	400.00	16.00	L-11
			Mazdoor	day	0.14	250.00	35.00	L-13
			c) Machinery					
			Compressor with guniting equipment along with accessories	hour	0.10	726.00	72.60	P&M-076

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 10 % on (a+b+c)				76.32	
		e) Contractor's profit @ 10 % on (a+b+c+d)				83.95	
		Rate per sqm = (a+b+c+d+e)				923.47	
					<b>say</b>	<b>923.00</b>	
16.4	2800	Providing and inserting nipples with approved fixing compound after drilling holes for grouting as per Technical Specifications including subsequent cutting/removal and sealing of the hole as necessary of nipples after completion of grouting with Cement/Epoxy					
		<b>Unit = Number</b>					
		<b>Taking output = 1 No.</b>					
		<b>a) Material</b>					
		Nipples	each	1.00	27.00	27.00	M-129
		Cement, fixing compound and consumables @ 15 per cent of cost of nipple				4.05	
		<b>b) Labour</b>					
		Mate	day	0.01	300.00	3.00	L-12
		Mazdoor (Skilled) labour for drilling	day	0.08	400.00	32.00	L-15
		Mazdoor (Skilled) labour for fixing nipple and sealing inlets	day	0.08	400.00	32.00	L-15
		Mazdoor for cutting and removing of nipples	day	0.04	250.00	10.00	L-13
		Add 10 per cent of labour cost for drilling holes etc				7.70	
		c) Overhead charges @ 10 % on (a+b)				11.58	
		d) Contractor's profit @ 10 % on (a+b+c)				12.73	
		Rate per No. = (a+b+c+d)				140.06	
					<b>say</b>	<b>140.00</b>	
16.5	2806	Sealing of cracks/porous concrete by injection process through nipples/Grouting complete as per Technical Specification.					
		<b>A Cement Grout</b>					
		<b>Unit = kg</b>					
		<b>Taking output = 1 kg</b>					
		<b>a) Material</b>					
		Cement including 10 per cent wastage	kg	1.10	8.12	8.93	M-081/1000
		Admixtures (anti shrinkage compound) @ 20 per cent of cost of cement				1.79	
		<b>b) Labour</b>					
		Mate	day	0.08	300.00	24.00	L-12
		Mazdoor (Skilled)	day	0.10	400.00	40.00	L-15
		Mazdoor	day	0.10	250.00	25.00	L-13
		<b>c) Machinery</b>					
		Grout pump with agitator and accessories	hour	0.10	165.00	16.50	M-111
		d) Overhead charges @ 10 % on (a+b+c)				11.62	
		e) Contractor's profit @ 10 % on (a+b+c+d)				12.78	
		Rate per kg = (a+b+c+d+e)				40.91	
					<b>say</b>	<b>41.00</b>	
		<b>B Cement Mortar (1:1) Grouting</b>					
		<b>Unit = kg</b>					
		<b>Taking output = 1 kg</b>					
		<b>a) Material</b>					
		Cement including 10 per cent wastage	kg	0.55	8.12	4.47	M-081/1000
		Sand including 10 per cent wastage	kg	0.55	0.36	0.20	M-005/1500
		Admixtures (anti shrinkage compound) @ 20 per cent of cost of cement				0.89	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Labour</b>					
		Mate	day	0.08	300.00	24.00	L-12
		Mazdoor (Skilled)	day	0.10	400.00	40.00	L-15
		Mazdoor	day	0.10	250.00	25.00	L-13
		<b>c) Machinery</b>					
		Grout pump with agitator and accessories	hour	0.10	165.00	16.50	M-111
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				11.11	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				12.22	
		<b>Rate per kg = (a+b+c+d+e)</b>				134.38	
					<b>say</b>	<b><u>134.00</u></b>	
16.6	2800	Patching of damaged concrete surface with polymer concrete and curing compounds, initiator and promoter, available in present formulations, to be applied as per instructions of manufacturer and as approved by the Engineer.					
		<b>Unit = sqm</b>					
		<b>Taking output = 10 sqm for an average thickness of 25mm.</b>					
		<b>a) Labour</b>					
		Mate	day	0.06	300.00	18.00	L-12
		Mazdoor (Skilled)	day	0.75	400.00	300.00	L-15
		Mazdoor	day	0.75	250.00	187.50	L-13
		<b>b) Material</b>					
		Pre-packed polymer concrete based on epoxy system complete with curing compound, initiator and promoter including 5 per cent wastage.	kg	315.00	33.00	10395.00	M-145
		<b>c) Machinery</b>					
		Grout pump with agitator and accessories	hour	2.00	165.00	330.00	M-111
		<b>d) Overhead charges @ 10 % on (a+b+c)</b>				1123.05	
		<b>e) Contractor's profit @ 10 % on (a+b+c+d)</b>				1235.36	
		Cost for 10 sqm = a+b+c+d+e				13588.91	
		<b>Rate per sqm = (a+b+c+d+e)/10</b>				1358.89	
					<b>say</b>	<b><u>1359.00</u></b>	
		<b>Note</b> This item is a proprietary item available in market as pre-packed polymer concrete and is required to be applied as per instructions of the manufacturer.					
16.7	2803	Sealing of crack / porous concrete with Epoxy Grout by injection through nipples complete as per clause 2803.1.					
		<b>Unit = kg</b>					
		<b>Taking output = 1 kg</b>					
		<b>a) Material</b>					
		Epoxy including 10 per cent wastage	kg	1.10	220.00	242.00	M-095
		<b>b) Labour</b>					
		Mate	day	0.08	300.00	24.00	L-12
		Mazdoor (Skilled)	day	0.10	400.00	40.00	L-15
		Mazdoor	day	0.10	250.00	25.00	L-13
		<b>c) Machinery</b>					
		Epoxy Injection gun	hour	0.10	3025.00	302.50	P&M-078

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 10 % on (a+b+c)				63.35	
		e) Contractor's profit @ 10 % on (a+b+c+d)				69.69	
		Rate per kg = (a+b+c+d+e)				766.54	
					say	<u>767.00</u>	
16.9	2807	Removal of defective concrete, cleaning the surface thoroughly, applying the shotcrete mixture mechanically with compressed air under pressure, comprising of cement, sand, coarse aggregates, water and quick setting compound in the proportion as per clause 2807.1., sand and coarse aggregates conforming to IS: 383 and table 1 of IS: 9012 respectively, water cement ratio ranging from 0.35 to 0.50, density of gunite not less than 2000 kg/cum, strength not less than 25 Mpa and workmanship conforming to clause 2807.6.					
		<i>unit: sqm</i>					
		<i>Taking output = 10 sqm, 40 mm average thickness.</i>					
		a) Labour					
		Mate	day	0.04	300.00	12.00	L-12
		Mazdoor	day	0.50	250.00	125.00	L-13
		Mazdoor (Skilled)	day	0.50	400.00	200.00	L-15
		b) Machinery					
		Air compressor 250 cfm	hour	1.00	516.00	516.00	P&M-001
		Shotcreting equipment	hour	1.00	726.00	726.00	P&M-076
		water tanker 6 KL capacity	hour	0.02	488.00	9.76	P&M-060
		c) Material					
		Cement	kg	120.00	8.12	974.40	M-081/1000
		Sand	cum	0.15	540.00	81.00	M-005
		Coarse aggregate of size 4.75mm	cum	0.15	600.00	90.00	M-024
		Quick setting compound	kg	2.50	50.00	125.00	M-147
		Water	KL	0.10	60.00	6.00	M-189
		d) Overhead charges @ 10 % on (a+b+c)				286.52	
		e) Contractor's profit @ 10 % on (a+b+c+d)				315.17	
		Cost for 10 sqm = a+b+c+d+e				3466.84	
		Rate per sqm = (a+b+c+d+e)/10				346.68	
					say	<u>347.00</u>	
16.10	2800	Applying pre-packed cement based polymer mortar of strength 45 Mpa at 28 days for replacement of spalled concrete					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm</i>					
		Assumed thickness - 10 mm					
		a) Material					
		Acrylic polymer bonding coat	Litre	1.40	121.00	169.40	M-057
		pre-packed cement based polymer mortar of strength 45 Mpa at 28 days	kg	12.00	33.00	396.00	M-145
		Add 3 per cent of (a) above for wastage.				16.96	
		b) Labour					
		Mate	day	0.04	300.00	12.00	L-12
		Mazdoor (Skilled)	day	0.50	400.00	200.00	L-15
		Mazdoor	day	0.50	250.00	125.00	L-13
		c) Overhead charges @ 10 % on (a+b)				91.94	
		d) Contractor's profit @ 10 % on (a+b+c)				101.13	
		Cost for 10 sqm = a+b+c+d				1112.43	
		Rate per sqm = (a+b+c+d)/10				111.24	
					say	<u>111.00</u>	



Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
16.19		<b>Replacement of Crash Barrier.</b>					
		<i>Unit = RM</i>					
		<i>Taking output = 10 M</i>					
		<b>a) Labour</b>					
		Labour for dismantling old railing and disposal of dismantled material.					
		Mate	day	0.40	300.00	120.00	L-12
		Mazdoor	day	10.00	250.00	2500.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley for disposal of dismantled material	hour	1.00	427.00	427.00	P&M-053
		<b>c) Overhead charges @ 10 % on (a+b)</b>				304.70	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				335.17	
		Cost for 10 m = a+b+c+d				3686.87	
		<b>Rate per metre = (a+b+c+d)/10</b>				368.69	
					<i>say</i>	<u>369.00</u>	
		<b>Note</b>					
		The rate for the construction of new crash barrier may be adopted from chapter 8 on Traffic and Transportation.					
16.20		<b>Replacement of Damaged Mild Steel Railing</b>					
		<i>Unit = RM</i>					
		<i>Taking output = 10 M</i>					
		<b>a) Labour</b>					
		Labour for dismantling old railing and disposal of dismantled material.					
		Mate	day	0.16	300.00	48.00	L-12
		Mazdoor	day	4.00	250.00	1000.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley for disposal of dismantled material	hour	1.00	427.00	427.00	P&M-053
		<b>c) Overhead charges @ 10 % on (a+b)</b>				147.50	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				162.25	
		Cost for 10 m = a+b+c+d				1784.75	
		<b>Rate per metre = (a+b+c+d)/10</b>				178.48	
					<i>say</i>	<u>178.00</u>	
16.21		<b>Repair of Crash Barrier</b>					
		Repair of concrete crash barrier with cement concert of M-30 grade by cutting and trimming the damaged portion to a regular shape, cleaning the area to be repaired thoroughly, applying cement concert after erection of proper form work.					
		<i>Unit = Running meter.</i>					
		<i>Taking output = 10 M.</i>					
		It is assumed that damage is to the extent of 10 per cent of the volume of concrete .This will require 0.30 cum of concrete.					
		<b>a) Manpower*</b>					
		Mate	day	0.04	300.00	12.00	L-12
		Mazdoor	day	1.00	250.00	250.00	L-13
		* For dismantling and trimming the surface to a regular shape and removal of damaged material.					
		<b>b) Material</b>					
		M-30 grade cement concrete excluding OH & CP (Rate as per items 14.1 C (i))	cum	0.30	6548.00	1964.40	Item 14.1(C)
		This may be priced based on the rate given the chapter of superstructure.					
		<b>c) Overhead charges @ 10 % on (a)</b>				26.20	
		<b>d) Contractor's profit @ 10 % on (a+c)</b>				28.82	
		Cost for 10 m = a+b+c+d				2281.42	
		<b>Rate per m = (a+b+c+d)/10</b>				228.14	
					<i>say</i>	<u>228.00</u>	

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
16.22		<b>Repair of RCC Railing</b>					
		Carrying out repair of RCC M30 railing to bring it to the original shape.					
		<b>Unit = Running meter.</b>					
		<b>Taking output = 10 M.</b>					
		It is assumed that damage is to the extent of 10 per cent .					
		<b>a) Material</b>					
		M-30 grade cement concrete excluding OH & CP (Rate as per items 14.1 C (i))	cum	0.10	6548.00	654.80	Item 14.1(C)
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.01	60305.00	783.97	Item 14.2 A
		<b>b) Labour*</b>					
		Mate	day	0.016	300.00	4.80	L-12
		mazdoor	day	0.20	250.00	50.00	L-13
		* For dismantling and trimming the surface to a regular shape and removal of damaged material.					
		<b>c) Overhead charges @ 10 % on (b)</b>				5.48	
		<b>d) Contractor's profit @ 10 % on (b+c)</b>				6.03	
		Cost for 10 m = a+b+c+d				1505.07	
		<b>Rate per m = (a+b+c+d)/10</b>				150.51	
					<b>say</b>	<b>151.00</b>	
16.23		<b>Repair of Steel Railing</b>					
		Repair of steel railing to bring it to the original shape					
		It is assumed that the damage to the steel railing is to the extent of 10 per cent .					
		<b>Unit = Running meter.</b>					
		<b>Taking output = 10 M.</b>					
		<b>a) Material</b>					
		Mild steel ISMC series	kg	29.00	57.21	1659.09	M-179/1000
		Flat iron	kg	10.00	57.21	572.10	M-179/1000
		MS Bolt and nuts	kg	1.00	100.00	100.00	M-130
		Add 5 per cent of cost of material for painting.				116.56	
		<b>b) Labour</b>					
		Mate	day	0.016	300.00	4.80	L-12
		Mazdoor (Skilled)	day	0.20	400.00	80.00	L-15
		Mazdoor	day	0.20	250.00	50.00	L-13
		<b>c) Overhead charges @ 10 % on (a+b)</b>				258.25	
		<b>d) Contractor's profit @ 10 % on (a+b+c)</b>				284.08	
		Cost of repair for 10m = a+b+c+d				3124.88	
		<b>Cost of meter = (a+b+c+d)/10</b>				312.49	
					<b>say</b>	<b>312.00</b>	

**Chapter –17**  
**STEEL BRIDGES**

**Preamble:**

**1 Description of items**

The description of items is given briefly and linked with Section 1900 of MoRT&H's Specifications for Road and Bridge Works, which may be referred for detailed description, provisions and interpretation.

**2 Overhead Charges**

The rates include over head charges considering the following elements -

- i. Site accomodation, setting up plant, access road, water supply, electricity and general site arrangements.
- ii. Office furniture, equipment and communications.
- iii. Expenditure on
  - a) Corporate office of contractor
  - b) Site Supervision
  - c) Documentation and "as built" drawings
- iv. Mobilisation/de-mobilisation of resources.
- v. Labour camps with minimum amenities and transportation to work sites.
- vi. Light vehicles for site supervision including administrative and managerial
- vii. Laboratory equipment and quality control including field and laboratory testing
- viii. Minor T&P and survey instruments and setting out works, including verification of line and dimensions where required.
- ix. Watch and ward
- x. Traffic management during construction
- xi. Expenditure on safeguarding environment
- xii. Sundries
- xiii. Financing Expenditure
- xiv. Sales/Turn over tax
- xv. Work Insurance/compensation

3 20 percent overhead charges has been considered in the schedule of rates

**4 Contractor Profit**

10 percent of cost of works. Contractor profit is also added on overhead charges.

**5 Materials**

6 Quantities of materials considered in the rate are approximate for the purpose of estimating and include normal wastages.

- 7 The transportation cost has to be included separately in the estimate as per actual distance from the fabrication shop to work site inclusive of loading and unloading and protected stacking in undamaged condition near site as per direction of the Engineer -in charge .
- 8 Painting and the specifications of materials to be used shall be as per section 1900 of MoRT&H Specifications for Road and Bridge Works.
- 9 One mate has been provided for 25 labours
- 10 Carriage cost of bridge components from protected stacks near site has been included for transportation, assembling and erection as per requirement based on pproved erection programme.
- 11 Arrangement for traffic during construction shall be as per Clause 112 of MoRT&H Specifications for Road and Bridge Works.

CHAPTER-17								
STEEL BRIDGES								
Sr No	Ref. to MoRT		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
17.1	1900		Supply and fabrication of steel work at Fabricators workshop comprising of Main Girders, Cross Girders, Connecting plates, stringer, stiffening plates etc. from steel plates and structural steel of specified grades as per approved drawing including straightening, descaling, degreasing, cutting to size and shape, drilling, welding and grinding, supply of all MS/HTS shop or site bolts, nuts & washers, holding down bolts and nuts etc., trial assembling at workshop, one priming coat of shop paint with red lead paint conforming to IS-102 with all labour, material, cost of paints, consumables, stacking in protected condition etc. complete as per specification and as directed by the Engineer-in-Charge (Carriage cost from fabricator work shop to actual bridge site will be paid seperately).					
		A	<b>COMPOSITE BRIDGE</b>					
	case	(i)	<b>Worked out based on 40m single span or in Multiples</b>					
			<b>Unit = 1 MT</b>					
			<b>Taking output = 425.472 MT</b>					
			<b>a) Material</b>					
			Structural steel in plates, angles, etc including 5 per cent wastage	tonne	446.75	57210.00	25558315.78	M-179
			Nuts & bolts	Kg	12764.2	100.00	1276416.00	M-130
			<b>b) Labour</b>					
			(for cutting, bending, making holes, joining, welding and erecting in position)					
			Mate	day	421.22	300.00	126365.18	L-12
			Fitter	day	2340.10	400.00	936038.40	L-08
			Blacksmith	day	2340.10	400.00	936038.40	L-02
			Welder	day	2340.10	400.00	936038.40	L-02
			Mazdoor	day	3510.14	250.00	877536.00	L-13
			<b>c) One coat of ready mixed,red lead primer painting at the shop confirming to IS:102 before shifting to site as per Section 1906.4</b>					
			3/5 part considered for one coat of primer after cleaning as specified uner 1906.2 of section 1900	sqm	4995.04	36.60	182818.51	Item 8.9
			Add @ 1% on cost of material for scaffolding and temporary arrangement for assembling on (a)				268347.32	
			Electrodes, cutting gas and other consumables @ 10 per cent of cost of (a) above				2683473.18	
			<b>e) Overhead charges @ 20 % on (a+b)</b>				6756277.43	
			<b>f) Contractor's profit @ 10 % on (a+b+c)</b>				4053766.46	
			<b>Rate per MT (a+b+c+d+e+f)</b>				104804.62	
						<b>say</b>	<b>104805.00</b>	

Sr No	Ref. to MoRT	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
17.2	1900	Taking delivery of fabricated steelwork from stacks at site as necessary, assembling and erection of fabricated steel structure to proper line , level and camber as per approved drawings complete in all respect including transportation and handling supply of all fasteners. Painting of all exposed surfaces of steelwork after erection with one coat of red lead confirming to IS-102 and two coats Alumunimium paint to IS-2339, grouting of anchor bolts in position, including all labour, consumables, materials, machinery, tools and tackles complete as per specification and as directed by the Engineer-in-Charge					
		<b>COMPOSITE BRIDGE</b>					
	case (i)	<b>Worked out based on 40m single span or in Multiples</b>					
		<b>Unit = 1 MT</b>					
		a) Assembling and erection at site including labour component,erection cum dismantling of Staging, Scaffolding, Falseswork etc complete.(A full proof method statement of erection programe at site has to be submitted and get approved before start)					
		Formwork,Staging and Cost of erection 15%+15%=30% of Item:17.1 (a+b+c+d)	tonne	1	23819.23	23819.23	
		b) One coat of ready mixed,red lead primer painting after erection at site confirming to IS:102					
		2/5 part considered for one coat of primer after cleaning as specified under 1906 of section 1900	sqm	11.74	24.40	286.46	Item 8.9
		Two coat of alluminium paint over steel primer after cleaning as specified under 1906 of section 1900	sqm	11.74	58.00	680.92	Item 8.9
		c) Overhead charges @ 20 % on (a+b)				4957.32	
		d) Contractor's profit @ 10 % on (a+b+c)				2974.39	
		Rate per MT (a+b+c+d)				32718.32	
					say	<b>32718.00</b>	