

**PUBLIC WORKS DEPARTMENT**

No.CE/Pl/Admn/1014/2005

Office of the Chief Engineer  
PWD Administration  
Thiruvananthapuram,  
Dated: 26-09-2014

**C I R C U L A R**

Sub: - General instructions regarding preparation of estimates for road and bridge works- reg

Ref:- Decision of the Chief Engineer's Committee held on 25<sup>th</sup> September 2014

It has been noticed that in the estimates prepared and submitted by various offices there are inconsistencies with regard to item specifications, selection of items, preparation of data, adoption of SOR etc. With a view to rectify such type of defects, Government have already directed to adopt standard CPWD/ MORTH data and with Delhi Schedule of Rates. But, still there are ambiguities among Engineers in adopting such specification and data. In the above context, following instructions are hereby issued which is to be complied in all roads and bridges projects with immediate effect.

1. In the case of road and bridges works, the order of priority of adoption of specification and data will be as below:
  - (i) Specification by Ministry of Road Transport & Highways (MoRTH)
  - (ii) CPWD Specifications
  - (iii) Specification by Ministry of Rural Development (MoRD)
  - (iv) Specification & Data as approved and issued by Chief EngineerReason to go down in the order of priority is to be clearly explained in the estimate report.
2. The order of priority of adoption of rates shall be as below:
  - (i) Current Delhi Schedule of Rates for material, labour & hire charges of machineries
  - (ii) Rates as approved and published by Chief Engineer / Government
  - (iii) Local market rates as certified by Executive Engineers
3. In the case of road maintenance items including surface renewal, the data analysis as approved and published alongwith this circular may be adopted. However, these items are not to be adopted for original works unless the situation warrant so and in such cases the estimate report should bring out the scope of work clearly indicating the same.
4. When open graded premix carpeting with manual spreading and static three wheeled roller compaction is adopted, the necessity shall be explained in the estimate report.
5. The items of pot hole filling, leveling coarse etc. using the data issued by Chief Engineer shall be included in works if the site condition demand so. However, in such cases specific reason for adopting the same shall be explained in the estimate report.
6. For earth work items, mechanical means shall be adopted. In case manual means and mechanical means using bull dozers are adopted, the essentiality of the same have to be substantiated in the estimate report.
7. Thickness of granular subbase (GSB) layer and wet mix macadam (WMM) layer shall be 15 to 20cm in general. However, if the site condition warrants more thickness it has to be substantiated with proper pavement design.
8. BUSG, SDBC shall not be adopted in future as there is no such specification prevailing in the MoRTH.

9. GSB shall be used only as drainage layer of pavement not for filling over weak soil.
10. Standard leveling course items as approved and circulated alongwith shall be adopted depending upon its necessity when BM overlay is proposed over old chipping carpet surface.
11. In BM work, levelling course with BM shall be limited to 10%. In case it exceeds the 10%, detailed quantity calculation based of levels shall be supplemented.
12. DBM shall not be adopted without proper pavement structure design.
13. BC works are to be done with 30mm thickness as specified in MoRTH specification.
14. Provision of irish drain/ berm concreting shall be limited to the bare minimum. In case it is inevitable 15cm thick 1:3:6 using 40mm aggregate with 5cm M-20 wearing course using 20mm aggregate without shuttering shall be adopted.
15. In the case of CC drains, 15cm thick M-10 concrete with 40 mm aggregate shall be adopted as foundation course and 20cm thick M-15 plain cement concrete shall be adopted for wall in general. No plastering shall be done for the drain works except for the visible floor area of drains.
16. Specific approval shall be obtained from the competent authority for any deviation from the guidelines mentioned above.
17. For works for which already TS issued / tendered, a comparison with prevailing rate including for hire charges of machineries) is to be prepared and submitted for tender approval strictly based on the data approved for the work .
18. In the case of all works proposed for tender acceptance above the estimate rates, local market rates analysis (LMR) based on the data approved for the work with the rates already approved and published which is available in the website has to be worked and submitted with proper certification regarding the rates.
19. It is noticed that in the case of estimates for which TS is to be issued by Chief Engineer, Chief Engineer's Committee and Government Committee, scrutiny of the estimates is not being properly carried out at various intermediate office levels resulting in delay for correction and modification of the estimates at later stage. This will be viewed seriously in future. It is strictly directed that estimates submitted to higher offices need to be thoroughly scrutinized at respective Subdivision, Division and Circle levels with respect to its provisions, technical specifications, data, measurements, drawings etc. Specific attention need to be made in adhering relevant specification and circulars issued by competent authority from time to time.
20. Strict action will be taken against the officers who fail to comply with the above.



P K Satheesan  
Chief Engineer (R&B and Administration)

To

All Chief Engineers, PWD, Thiruvananthapuram.  
All Superintending Engineers of PWD.  
All Executive Engineers in PWD.  
All Asst. Executive Engineers in PWD.  
All Asst. Engineers in PWD

**Annexure to Circular No. CE/PI/Admn/1014/2005 dated 26-09-2014**

Open - Graded Premix Surfacing					remarks
Providing, laying and rolling of open - graded premix carpet of 20 mm thickness with 0.27 cum of 12 mm departmental aggregates premixed with 12.96 kg of bitumen /10 sqm using penetration grade bitumen to required line, grade and level on a previously prepared base, after priming the existing surface with 5 kg of bitumen(vg 10 or s90)/10 sqm including mixing in a suitable plant, laying and rolling with a three wheel static roller of 80-100 KN capacity, finished to required level and grades, followed by a seal coat of 0.09 cum of 6 mm departmental aggregates premixed with 8.64 kg of bitumen /10 sqm					item no 503(1),508(1) and 510(1) of MORD
By Manual Means					Sl.No.in DSR 2013
Unit = sqm					
Taking output = 500 sqm (10 cum)					
<b>a) Labour</b>					
Mate	day	1.600	328.00	524.80	128
Mazdoor (un skilled) including labour for tacking	day	32.000	297.00	9504.00	115
Mazdoor (semi-Skilled)	day	8.730	297.00	2592.81	115
Bitumen sprayer	day	0.455	328.00	149.24	138
<b>b) Machinery</b>					
hot bitumen mixer (mixall)	hour	4.000	500.00	2000.00	23
Bitumen boiler oil fired 1000 litre capacity fitted with hour spray set	hour	5.000	141.25	706.25	1 & 7
Three wheel 80-100 KN static roller	hour	3.000	460.00	1380.00	55
<b>c) Material</b>					
Bitumen@ 26.60 kg per 10 sqm	tonne	1.330	40000.00	53200.00	309
carriage code		1.330	106.64	141.83	2211
<b>d) cost index</b>					
		<b>0.380</b>		26675.59	
<b>e) Overhead charges @ 0.1 on (a+b+c+d)</b>					2345.85
<b>f) Contractor's profit @ 0.1 on (a+b+c+d+e)</b>					2580.44
Cost for 500 sqm = a+b+c+d+e					101800.82
Rate per sqm = (a+b+c+d+e+f)/500					203.60
<b>say 204 / m 2</b>					
<b>Supplying and stacking 12mm hard blue granite broken stone in standard heaps for measurement(IRC 3.2.1.a)</b>					
cost of metal	m3	1.00	1,050.00	1050.00	296
carriage code	m3	1.00	106.64	106.64	2202
cost index		<b>0.38</b>		439.52	
Add 10% Contractors profit				159.62	
Add 5% Over Head charges				79.81	
<b>Total</b>		<b>m3</b>		<b>1835.59</b>	
<b>Say Rs. 1836 / m 3</b>					
<b>Supplying and stacking 6mm hard blue granite broken stone in standard heaps for measurement(IRC 3.2.1.a)</b>					
cost of metal	m3	1.00	1,100.00	1100.00	298
carriage code	m3	1.00	106.64	106.64	2202

cost index		0.38		458.52	
Add 10% Contractors profit				166.52	
Add 5% Over Head charges				83.26	
<b>Total</b>		<b>m3</b>		<b>1914.94</b>	
<b>Say Rs. 1915 / m 3</b>					
<b>Supplying and stacking 36mm size hard broken stone in standard heaps for measurement.</b>					
36mm broken stone	m3	1.00	1,000.00	1000.00	293
carriage code	m3	1.00	106.64	106.64	2202
cost index		0.38		420.52	
Add 10% Contractors profit				152.72	
Add 5% Over Head charges				76.36	
<b>Total</b>		<b>m3</b>		<b>1756.24</b>	
<b>Say Rs. 1756 / M 3</b>					
<b>Levelling undulation with precoated chips with 1% of paving bitumen(vg 10) by weight of chips in a suitable mixer duly heated to 160 degree temperature spreading, levelling and rolling to required line and level for thickness up to 20 mm.</b>					item no 507.2.5 of MORD & KSS 3.1.1.2
<b>For 30Cum (Cf 507.2.5 RRM)</b>					2550.00
Mate	day	0.600	328.00	196.80	128
Mazdoor (unskilled)	day	15.000	297.00	4455.00	115
Labour for spreading and laying					
Special man mazdoor	day	54.000	297.00	16038.00	115
Women	day	22.500	297.00	6682.50	115
Bitumen boiler oil fired	hour	6.000	103.75	622.50	1
hot bitumen mixer (mixall)	hour	6.000	500.00	3000.00	23
Cost of bitumen	t	0.480	40,000.00	19200.00	309
Conveyance	t	0.480	106.64	51.19	2211
cost index		0.380		19093.48	
Add 10% Contractors profit				4284.35	
Add 10% Over Head charges				4712.78	
		<b>Total</b>	<b>m3</b>	<b>78336.59</b>	
<b>Say Rs. 3784 / m 3</b>					
<b>Providing pre mix bitumen leveling coarse having thickness between 20mm and 40mm with 12mm deptl metal by spreading the metal to line and levels and rolling until the compacted coarse aggregate has a firm surface and applying hot bitumen(vg 10) with pressure sprayer at the rate of 48 Kg per M3 metal including all cost of bitumen conveyance heating mixing spreading in appropriate locations to proper levels compacting with power roler and other sundry stores.</b>					Observed data based on KSS 3.1.2.2
Hire of roller	0.045	Day	3,680.00	165.60	55
Auto pick up	0.135	Day	1,500.00	202.50	MR
Hire of boiler and sprayer	0.045	Day	1,130.00	50.85	1&7
Hire of mixing plant	0.045	Day	4,000.00	180.00	23
Cost of bitumen	0.048	t	40,000.00	1920.00	309.00

Conveyance	0.048	t	106.64	5.12	2211.00
Special man mazdoor	3.750	E	297.00	1113.75	115.00
Women	1.500	E	297.00	445.50	115.00
cost index		<b>0.38</b>		1474.71	
Add 10% Contractors profit				290.84	
Add 5% Over Head charges				145.42	
<b>Total</b>				<b>5994.29</b>	
<b>Say Rs. 5994 m3</b>					
<b>Providing bitumen leveling coarse between 40mm and 150mm with 36mm deptl metal by spreading the metal to line and levels and rolling until the compacted coarse aggregate has a firm surface and applying hot bitumen with pressure sprayer at the rate of 20 Kg per M3 metal including all cost of bitumen conveyance heating mixing spreading in appropriate locations to proper levels compacting with power roler and other sundry stores.</b>					KSS 3.1.3.2
Hire of roller	0.022	Day	3,680.00	80.96	55
Auto pick up	0.066	Day	1,500.00	99.00	MR
Hire of boiler and sprayer	0.022	Day	1,130.00	24.86	1&7
Cost of bitumen	0.020	t	40,000.00	800.00	309
Conveyance	0.020	t	106.64	2.13	2211
Special man mazdoor	1.000	E	297.00	297.00	115
Women	0.500	E	297.00	148.50	115
cost index		0.38		514.31	excluding mr
Add 10% Contractors profit				86.28	
Add 5% Over Head charges				43.14	
<b>Total</b>			<b>m3</b>	<b>2096.18</b>	
<b>Say Rs. 2096 m3</b>					
<b>Filling up pot holes (cut and formed to regular shapes and all loose and defective materials removed) after supplying a prime coat of hot bitumen using 36mm departmental broken stone and compacting with power roller to get a compact surface</b>					KSS 3.6.1.2
Hire of boiler and sprayer	0.030	day	1,130.00	33.90	1&7
Hire of roller	0.030	day	3,680.00	110.40	55
Auto pick up	0.090	day	1,500.00	135.00	MR
Cost of bitumen	0.0275	t	40,000.00	1100.00	309
Conveyance	0.0275	t	106.64	2.93	2211
Special man mazdoor	1.750	E	297.00	519.75	115
Man	0.750	E	297.00	222.75	115
Women	0.750	E	297.00	222.75	115
cost index		0.38		840.74	excluding mr
Add 10% Contractors profit				208.82	
Add 5% Over Head charges				104.41	
<b>Total</b>			<b>m3</b>	<b>3501.46</b>	
<b>Say Rs. 3501 / m 3</b>					
<b>Filling up pot holes (cut and formed to regular shapes and all loose and defective materials removed) after supplying a prime coat of hot bitumen using 12mm departmental broken stone and compacting with power roller to get a compact surface</b>					KSS 3.6.2.2
Hire of boiler and sprayer	0.060	day	1,130.00	67.80	1&7
Hire of roller	0.060	day	3,680.00	220.80	55

Auto pick up	0.180	day	1,500.00	270.00	MR
Cost of bitumen	0.0600	t	40,000.00	2400.00	309
Conveyance	0.0600	t	106.64	6.40	2211
Special man mazdoor	5.000	E	297.00	1485.00	115
Man	0.500	E	297.00	148.50	115
Women	2.000	E	297.00	594.00	115
cost index		0.38		1870.55	excluding mr
Add 10% Contractors profit				466.30	
Add 5% Over Head charges				233.15	
<b>Total</b>		<b>m3</b>		<b>7762.50</b>	
<b><u>Say Rs. 7763 / m 3</u></b>					

**Note-** Above analysis has been done based on a cost index of 138. While preparing estimates appropriate cost index as applicable for the location shall be adopted