

Subject: Performance Based Maintenance Contracts (PBMCs) for link roads.

The subject cited matter was discussed in meetings held on 13.08.2018 & 21.08.2018 under the chairmanship of Secretary Public Works in which Secretary, Punjab Mandi Board, C.E (PRBDB), C.E. (PMB) and S.E.(PRBDB) were present. It was brought out by Chief Engineer (PMB) that due to inadequate availability of funds, almost no annual/routine maintenance works are carried out on link roads and after 6 years the link roads are included in Special Repairs Programme. For the current year i.e. 2018-19, the works for Special Repairs on about 16000 Km of link roads (both under PWD (B&R) & PMB) have been awarded recently at a cost of about Rs. 1700 crore and the works are in progress.

It was intimated by CE (PMB) that 18ft wide roads which connect 4-5 villages and serve as bus routes have reasonably good crust. Including such category of roads under (PBMC) will ensure proper maintenance of these roads and will provide good service to the public at large. This will also make the contracts viable for Contractors. For availing the benefits of a long term PBMC it was decided to keep the duration of such contracts as five (5) years.

For implementing PBMCs on link roads it was deliberated as under:

- (1) Performance Based Maintenance contracts may be used for next year programme of Special Repairs on 12000 Km roads out of which approx. 1150 Km roads are 18 ft. wide and the remaining roads are 10 ft. wide. Necessary bidding documents can be prepared, accordingly, to implement the PBMC concept, by including performance based five (5) year maintenance after completion of S/R works.
- (2) Pilot project of Performance Based Maintenance may be carried out on link roads initially under two market committees i.e. in Bhawanigarh MC (Distt. Sangrur) & Samana MC (Distt. Patiala), where the Special Repair works have been completed earlier and the Defect Liability Periods

have got completed recently or are nearing completion. The details of roads for piloting the PBMC are as under:

Sr. No.	Market Committee	Road Length (Km)
1	Bhawanigarh (Sangrur)	28.49
2	Samana (Patiala)	24.46
	Total	52.95

- (3) Performance based maintenance contracts on Link roads which were upgraded under PMGSY and have completed 5 year maintenance period & are in fair/good condition, may be taken-up. The length of such roads is about 700 Km and Govt. of India has already released Rs. 41.08 Crore as financial incentive for such roads and the State is required to give its share of Rs. 27.35 crore.

During the deliberations it was intimated by the CE (PMB) that based on the recent S/R programme, the average cost of Special Repairs for 10ft. wide link road works out to about Rs. 11 lakh per Km, out of which the cost of laying renewal coat on such roads is about Rs. 6.50 lakh per Km. The Special Repairs include raising of road levels, strengthening of crust and complete laying of renewal coat which is 20mm premix carpet. For 18ft wide roads the cost of Special Repairs is tentatively Rs. 19.5 Lakh/ Km and the cost of laying renewal coat is Rs. 11.70 Lakh/ Km.

Based on the pattern of Madhya Pradesh Rural Road Development Authority if performance based repair and maintenance of these roads is taken up, the following performance index can be adopted:

Routine Maintenance Activities and their frequency with performance index –

Sr. No.	Name of Item/Activity	Frequency of operations in the year	Performance Index/Score for compliance	Cure period after being pointed out
1	Restoration of rain cuts and dressing of berms as per clause 1902 of the Specifications.	As and when required.	10	1 day

Sr. No.	Name of Item/Activity	Frequency of operations in the year	Performance Index/Score for compliance	Cure period after being pointed out
2	Making up of shoulders as per clause 1903 of the Specifications.	As and when required.	20	1 day
3	Maintenance of Bituminous surface road and / or gravel road and / or WBM road including filling pot holes and patch repairs etc. as per clause 1904, 1906 of the Specifications.	As and when required.	50	2 days
4	Maintenance of drains as per clause 1907 of the Specifications.	As and when required, but at least twice.	3	1 day
5	Maintenance of culverts and causeways as per clause 1908 and 1909 of the Specifications.	As and when required, but at least twice.	5	2 days
6	Maintenance of guard rails and parapet rails as per clause 1911 of the Specifications.	Maintenance as and when required.		
7	Maintenance of roads signs as per clause 1910 of the Specifications.	Maintenance as and when required.	2	2 days
8	Maintenance of 200 m and Kilo Meter stones as per clause 1912 of the Specifications.	Maintenance as and when required.	2	2 days
9	Cutting of shrubs and trimming of grass and weeds etc. as per clause 1914 of the Specifications.	As and when required.	3	1 day
10	White washing parapets of C.D. Works	As and when required ,at least once in a year	2	2 days
11	White washing guard stones	As and when required, at least twice in a year		
12	Re-fixing displaced guard stones.	As and when required , at least once in a year		
13	Repair of old joints sealant (CC joints).	Maintenance as and when required.	3	2 days

The following payment criteria for routine maintenance contracts can be adopted:

The payment for maintenance may be made **once in 3 months @ 1/4 of the approved per Km rate**. Before releasing payment for a particular road engineer will see, with reference to the above 100-point (hundred point) performance index that contractor has attended required maintenance works during that period within the stipulated time. If contractor has not attended maintenance work to the required standard and performance index is below 80 points (eighty points) no payment will be released for that period even if such maintenance is attended in subsequent months. If performance index is between 80 to 100, proportionate deduction in payment will be made.

The monthly inspection of the road for checking compliances to stipulated maintenance requirement shall be carried out within 7 days of close of immediate preceding month on random audit lengths (of upto 2 Km each, totaling 40% of the network road length) by the Executive Engineer in the presence of the contractor. This will ensure that entire network is inspected before release of quarterly maintenance payment.

Since major component of the Performance Index relates to Maintenance of Bituminous surface road and / or gravel road and / or WBM road including filling pot holes and patch repairs, making up of shoulders, restoration of rain cuts and dressing of berms etc., accordingly, it is proposed to provide following Performance criteria:

A. Potholes (Sealed Surface)

- i. There should be not more than 5 potholes within any continuous 1km centre line length with a diameter (largest dimension) greater than 150mm.
- ii. No pothole shall be more than 50mm in depth when measured by tape measure or calibrated steel probe.

B. Unsealed Shoulder Maintenance

- i. There is no edge rutting or low shoulder greater than 50mm depth when measured from the edge of the sealed surface to the shoulder aggregate or soil at any location when

measured by tape measure. There shall be no high shoulder extending above the level of the sealed surface when measured with a 3m straight edge.

- ii. There are no more than 10 depressions within any continuous **1km** centre line length with a diameter greater than 400mm. No pothole shall be greater than 100mm in depth when measured by tape measure.
- iii. The maximum diameter of any single pothole shall not be greater than 400mm.

C. Restoration of rain cuts and dressing of berms

There should be no rain cut or washout unrectified at the time of monthly audit. All bridges approaches will be audited by the Executive Engineers or its representative.

During the Contract, the road assets may suffer damages due to **Unforeseen Events/Emergency Events** e.g., rainfall of return-period of 50 years or other such events which may not be attributable to the Contractor. The concerned Superintending Engineer PWD (B&R) will determine if the damage have been caused due to Emergency Event, provided in the previous months the Performance Index score of Contractor has been more than 80. Item rates for certain activities (to be carried-out on time bound basis) for meeting the emergency damages will also have to be included in the Bidding Document.

From the study of provisions in the Tender Document for Repair and Maintenance of Rural Roads issued by Madhya Pradesh Rural Road Development Agency (MPRRDA) under PBMCs and general field experience, it is estimated that annual maintenance cost per Km of the link roads, 10ft wide is Rs. 28,000/- and for 18ft wide road is Rs. 50,000/-.

The cost comparison for a 10 ft wide link road using present maintenance practices and PBMCs is as under:

S. No.	Item	Amount
1	Cost of Special Repairs (once in six years)	Rs. 11 Lakh / Km
2	Cost of renewal coat, 20mm thick PC	Rs. 6.50 Lakh / Km
3	Tentative PBMC average Annual Maintenance	Rs. 0.28/ Km

	cost per year	
4	For five (5) year PBMC, total Mtc. cost	Rs. 1.4 Lakh/ Km
5	Total cost of renewal coat + 5 year PBMC Mtc cost	Rs. 7.9 Lakh/ Km
6	Tentative Savings / Km	Rs. 3.1 Lakh / Km

The cost comparison for a 18 ft wide link road using present maintenance practices and PBMCs is as under:

Sr. No.	Item	Amount
1	Cost of Special Repairs (once in six years)	Rs. 19.5 Lakh / Km
2	Cost of renewal coat, 20mm thick PC	Rs. 11.7 Lakh / Km
3	Tentative PBMC average Annual Maintenance cost per year	Rs. 0.50 / Km
4	For five (5) year PBMC, total Mtc. cost	Rs. 2.5 Lakh/ Km
5	Total cost of renewal coat + 5 year PBMC Mtc cost	Rs. 14.2 Lakh / Km
6	Tentative Savings / Km	Rs. 5.3 Lakh / Km

Upon perusal of the above cost comparison, it can be seen that there are substantial financial savings if the PBMCs are implemented in the State. The performance based maintenance will also provide good service to the road user in Rural areas and will increase the reputation of the Department.