

## SECTION - 9

### QUANTITIES AND PROJECT COSTS

#### 9.1 General

The cost estimate presented in this Section is based on the detailed proposals given in Section 6. It is envisaged that the project would involve site clearance, construction of new formation in cutting, slope protection works, cross-drainage structures and bridges, pavement and road furniture etc. The detailed cost estimate presented in this report has been worked out using quantities of different items of works derived from the detailed design, drawing and unit rates.

#### 9.2 Estimation of Quantities

In arriving at the quantities, the following items of civil works have been computed for the total length of the road :

- \* Earthwork Works
- \* Slope Protection Works
- \* Culverts Works
- \* Bridge Works
- \* Pavement Works
- \* Road appurtenances

Detailed estimate of quantities and costs are presented in “Volume – III: Cost Estimate” of the report. Methodology followed for various items are based on Technical Specifications of Ministry of Road Transport and Highways (MoRTH) for material laying, its quality, measurements, etc. and it has been illustrated in brief in the subsequent paragraphs.

##### a) Earthwork :

Earthwork quantities in cutting and small quantities of filling are calculated by highway design software MxRoad for the entire length of the project road. The formation cutting consists of earth cutting to get a formation width of double lane standard. Through cutting has also been proposed in some locations especially in curves where the existing alignment has been followed to ease the curves while going round spurs. Embankment s has also been proposed at some stretches.

The classification of soil in cutting has been made in three categories :

- # Soil : includes ordinary soil, hard, soil mixed with boulder
- # Ordinary Rock not requiring blasting
- # Hard Rock requiring blasting.

Locations along the road alignment passing along the above given three were noted down during field surveys and total quantities of earthwork in cutting has been worked out accordingly.

##### b) Slope Protection Works :

Quantities for retaining walls, breast walls, parapet walls, toe walls, etc. have been worked out based on the design proposals. Gabion walls have also been proposed at specified locations and quantities have been worked out.

##### c) Culverts & Bridges:

Quantities of culverts and bridges have been worked out for all the stretches of the road based on the structure proposed at each location of cross-stream or river. The proposal also

includes quantity for construction of chutes to protect the adjoining areas from further erosion.

**d) Pavement :**

The provision for pavement includes different layers of sub-base, base, and surfacing course as appropriate throughout the whole stretch of the road.

# Granular Sub-base (GSB): 260mm thick sub-base layer of crushed stone aggregate has been proposed. The sub-base course has been extended up to full width of the formation.

# Extra quantities for widening at curves, major and minor junction locations are calculated separately and final quantities are worked out.

#Wet Mix Macadam Base (WMM): 250mm thick base layer of Wet Mix Macadam is proposed for 10.0m width.

#Dense Bituminous Macadam of 90 mm thick and 40mm thick of Bituminous Concrete as surfacing course has been proposed.

**e) Road Appurtenances**

Road appurtenances include provision for road signs and markings, etc.

**9.3 Unit Rates**

The unit rates for arriving at cost of different components of works are based on Sikkim PWD Schedule of Rates 2012 (for National Highways). For those items of works which are not available in the SOR, separate Analysis of Rates have been carried out and incorporated in this DPR.

- Bitumen (60-70 grade) (Ex-Singtam) ( Basic rate = Rs 28386/ MT + 2% CST, Rs 567.7+4% SKVAT, Rs 1135.4 + 1% Env Cess (Cost +VAT) Rs. 295.2 +transportation from Barauni to Singtam (462Km xRs.11) Rs.5082.0= Rs 35466.3)
- Emulsion (Ex-Singtam) ( Basic rate = Rs 22916.0/ MT + 2% CST, Rs 458.3+4% SKVAT, Rs 916.6 + 1% Env Cess (Cost +VAT) Rs. 238.3 +transportation from Haldia to Singtam (740Km xRs.11) Rs.8140.0= Rs32669.20)
- Cement (43 grade) (Ex-Singtam) ( Basic rate = Rs 5500.00/ MT + 2% CST, Rs 110.0+14.5% SKVAT, Rs797.50 + 12.5 Rs. ED 687.50 + 1% Env Cess (Cost +VAT) Rs. 63.0 +transportation from Murshidbad to Singtam (467Km xRs.5.6) Rs.2615.2= Rs 9773.20)
- Cold twisted bars (HYSD Fe 500 Bars)( Basic rate = Rs 45700.0/ MT + 2% CST, Rs914.0+4% SKVAT, Rs 1828.0 + 1% Env Cess (Cost +VAT) Rs. 475.3 +transportation from Siliguri to Singtam (90Km xRs.5.6) Rs.504.0= Rs 49421.3)
- Sand & Aggregate from Teesta River.

**9.4 Construction Cost Items**

For construction of project road, the cost items include various elements, which added together, will give the total cost. The elements of the cost considered for the project are under the following major heads :

\* Site Clearance

- \* Earthwork
- \* Pavement Works
- \* Slope Protection Works
- \* Culverts Works
- \* Miscellaneous Works
- \* Provisional Sum

Based on the unit rate of various items as per rates adopted as mentioned earlier and quantities calculated, a detailed cost estimate has been prepared under the above mentioned major heads.

The total Project cost for civil construction works and other allied charges is **Rs. 207.30 Cr.**

<b>ABSTRACT OF COST ESTIMATE</b>					
<b>Sr.No.</b>	<b>Items of work</b>	<b>Total quantity</b>	<b>Unit</b>	<b>Amount (Rs)</b>	<b>Share</b>
	<b>CONSTRUCTION COST</b>				
1	Formation Cutting	16.54	Km		
a.	Jungle Clearance etc			699,969.50	0.05%
b.	Formation Works	859589.91	Cum	185,291,717.80	14.47%
2	Protection Works	13985.00	Rm	237,415,617.30	18.54%
3	Cross Drainage Works	71.00	Nos	104,927,409.55	8.19%
4	Pavement Works	16.54	Km	410,483,765.89	32.05%
5	Km Stones & Road Signs	83.00	Nos	7,389,980.00	0.58%
6	Road Safety Measures	1500.00	Rm	5,454,000.00	0.43%
7	Diversion of Existing Road During Construction & Development of Link Road and Junction		LS	20,188,739.00	1.58%
8	Bridge Work		LS	296,433,275.29	23.15%
9	General Items		LS	12,384,285.55	0.97%
<b>A</b>		<b>TOTAL OF (1to 9)</b>	<b>Rs</b>	<b>1,280,668,759.88</b>	<b>100.0%</b>
B	Escalation for 5 years @ 5%		Rs.	320,167,189.97	
<b>C</b>	<b>Civil Cost</b>		<b>Rs.</b>	<b>1,600,835,949.85</b>	
D	Contingency (2.8% of C)		Rs.	44,823,406.60	
E	<b>TOTAL (C+D)</b>		<b>Rs.</b>	<b>1,645,659,356.45</b>	
F	Construction Supervision Charge (3 % of E)		Rs.	49,369,780.69	
G	Quality Control Charge (0.25% of E)		Rs.	4,114,148.39	
H	Road Safety Audit Charge (0.25% of E)		Rs.	4,114,148.39	
I	Maintenance for 4Years (0.5%+1.5%x3=5% of C)		Rs.	80,041,797.49	
J	Escalation (15% of C)		Rs.	240,125,392.48	
K	Agency (NHIDCL) Charge (3 % of E)		Rs.	49,369,780.69	
		<b>TOTAL PROJECT COST</b>	<b>Rs.</b>	<b>2,072,794,404.58</b>	
		<b>Say</b>	<b>Rs.</b>	<b>2,073,000,000.00</b>	
		<b>Project Cost per Km</b>	<b>Rs.</b>	<b>125,320,097.01</b>	
		<b>Civil cost per km</b>	<b>Rs.</b>	<b>99,495,728.93</b>	