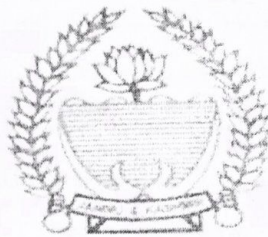# GOVT. OF JAMMU AND KASHMIR

Public Works Department(Roads & Buildings) Jammu

APPLICATION FOR ADMINISTRATIVE APPROVAL

For

Construction of Alternative alignment of Lakhanpur-Thein road, km 11th to 12th due to submergences of 2x39 mtr R.C.C .T. Girder Bridge on Nora Nallah (at 410.00 mtr level)

District = **Kathua**

Estimated Cost = **Rs.1728.80 lacs**

TECHNICAL REPORT

Name of Work :- Construction of Alternative alignment of Lakhanpur-Thein road, km 11th to 12th due to submergences of 2x39 mtr R.C.C .T. Girder Bridge on Nora Nallah (at 410.00 mtr level).

Authority :- Chief Engineer Shahpurkandi Dam Project ,Punjab.

Project Profile:- The Lakhanpur –Thein road takes off from Lakhanpur (NH-44) constructed in sixties and leads upto village Thein where Ranjit Sagar Dam is located. The length of this road is 19.00 kms .The scheme has been sanctioned under CRF, the first 10.00 kms have been upgraded/widened upto double lane specifications and the tender for the rest of 09 kms have been floated and allotted but it has come to notice that the 700.00 mtr length of road alongwith (2 x 39.00 mtr) RCC bridge of 78.00 mtr span is submerging due to the pounding of Shahpurkandi Dam.

Keeping in view, the Detailed Project report for the construction of new alignment having length of 500.00 mtr alongwith 191.00 mtr span RCC Bridge has been framed for accord of Administrative Approval as desired by the authorities of Shapurkandi Dam .

Proposals &
Specifications :- It has been proposed to construct the road alongwith bridge upto B.T. specification with road way width 10.50 mtrs and carriageway width 7.50 mtrs. The proposed specifications are as under :-
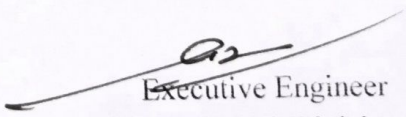
a). Earth work in cutting/filling shall be executed having formation width of 10.50 mtr .

b). 30 cm thick Granular Sub Base(GSB) with material conforming to grade - I (size range 75mm to 0.075 mm) having CBR Value-30 by providing close graded Material conforming to specifications, mixing in a mechanical mix plant at OMC with motor grader on prepared surface compacting with vibratory power roller to achieve the desired density, complete in the entire length of 0.53 kms.

c) 7.5 cm thick Wet mix macadam shall be laid including premixing the material with water at OMC in Mechanical Mix Plant as per IRC & MORT&H specifications in the entire length of 0.53 kms.

d). 50 mm thick Bituminous Macadam shall be laid with Hot Mix Plant & Paver finisher as per MOST specifications in the entire length of 0.53 kms.

e) 25 mm thick Semi Dense Bituminous Concrete shall be laid including tack coat with Hot Mix Plant and Paver finisher as per MOST specifications in the entire length of 0.53 kms.

f) 01 Nos. 3.00 mtr span RCC culvert and 03 Nos. 2.00 mtr span RCC culvert shall be constructed to drain off the water from minor nallahs and also to provide drainage crossings at suitable intervals.

g) Retaining Wall 175.00 mtr length and Breast Wall 280.00 mtr length shall be constructed wherever required.

h) Pucca drain 275.00 mtr. length shall be constructed.

i). Provision for installation of W-B crash barrier has been proposed.

j). Provision for Sign Boards and road marking shall also be provided.

k) It has been proposed to construct 191.00 mtr long Double Lane pre-stressed girder Bridge over Nora Nallah having carriageway level 410.00 mtrs and lowest nallah bed level 390.00 mtr as per MOST specifications.

Time & Cost :- The estimated cost of the project is **Rs. 1728.80.00 lacs** and shall be completed within a period of **01 year** subject to availability of funds & key construction material well in time.

Assistant Executive Engineer,
PWD (R&B) Sub Division No.II
Kathua

Executive Engineer
PWD (R&B) Division,
Kathua

ABSTRACT OF COST

Name of Work :- Construction of Alternative alignment of Lakhanpur-Thein road, km 11th to 12th due to submergences of 2x39 mtr R.C.C .T. Girder Bridge on Nora Nallah (at 410.00 mtr level).

S. No.	Items	Qty.	Rate	Amount (Rs. In lacs)
1.	Construction of 191.00 mtr long Double Lane RCC Bridge		Rs.7.63 lacs/Rmt	1457.33
2.	Earthwork in Cutting	m³	Rs. 250.00 m³	17.13
3.	Earthwork in Filling	65.00 m³	Rs. 275.00 m³	3.75
4.	30 cm Granular Sub Base (GSB)	1252.00 m³	Rs. 1080.00/m³	13.52
5.	10 cm Wet Mix Macadam(WMM)	417.00 m³	Rs. 1200.00/m³	5.00
6.	50 mm thick Bituminous Macadam	209.00 m³	Rs.7250.00/m³	15.15
7.	25 mm thick Semi Dense Bitumin Concrete	4174.00 m²	Rs. 260.00/m²	10.85
8.	3.00 mtr span RCC Culvert	01 No	Rs. 11.54 lac/No.	11.54
9.	2.00 mtr span RCC Culvert	03 No	Rs. 10.65 lac/No.	31.95
10.	Retaining Wall	175.00 Rmt	Rs. 19700.00/Rmt	34.48
11.	Breast Wall	280.00 Rmt	Rs. 12600.00/Rmt	35.28
12.	Pucca Drain	275.00 Rmt	Rs. 2380.00/Rmt	6.55
13.	Provision for Crash		L.S.	3.00
14.	Provision for Signa s including road marking etc.		L.S.	1.00
	Total :-			1646.53 lacs.
	W.C. Contingencies except L.S. items			49.39 lacs
	2% for Consultancy Charges except L.S. items			32.85 lacs
	Grand Total:-			1728.77 lacs

Say Rs. 1728.80 lacs

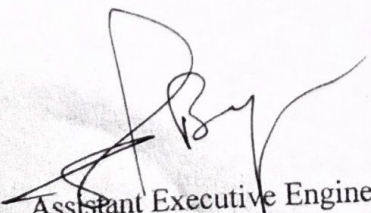Assistant Executive Engineer,
PWD(R&B) Sub Division No.II
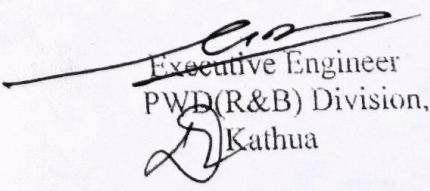Kathua

Executive Engineer
PWD(R&B) Division,
Kathua

ABSTRACT OF COST

Name of Work :- Construction of Alternative alignment of Lakhanpur-Thein road, km 11th to 12th due to submergences of 2x39 mtr R.C.C .T. Girder Bridge on Nora Nallah (at 410.00 mtr level).

S. No.	Items	Qty.	Rate	Amount (Rs. In lacs)
1.	Construction of 191.00 mtr long Double Lane RCC Bridge	191.00 mtr	Rs.7.63 lacs/Rmt	1457.33
2.	Earthwork in Cutting	6850.00 m^3	Rs. 250.00 m^3	17.13
3.	Earthwork in Filling	1365.00 m^3	Rs. 275.00 m^3	3.75
4.	30 cm Granular Sub Base (GSB)	1252.00 m^3	Rs. 1080.00/m^3	13.52
5.	10 cm Wet Mix Macadam(WMM)	417.00 m^3	Rs. 1200.00/m^3	5.00
6.	50 mm thick Bituminous Macadam	209.00 m^3	Rs.7250.00/m^3	15.15
7.	25 mm thick Semi Dense Bituminous Concrete	4174.00 m^2	Rs. 260.00/m^2	10.85
8.	3.00 mtr span RCC Culvert	01 No	Rs. 11.54 lac/No.	11.54
9.	2.00 mtr span RCC Culvert	03 No	Rs. 10.65 lac/No.	31.95
10.	Retaining Wall	175.00 Rmt	Rs. 19700.00/Rmt	34.48
11.	Breast Wall	280.00 Rmt	Rs. 12600.00/Rmt	35.28
12.	Pucca Drain	275.00 Rmt	Rs. 2380.00/Rmt	6.55
13.	Provision for Crash Barrier .		L.S.	3.00
14.	Provision for Signage & Boards including road marking etc.		L.S.	1.00
	Total :-			1646.53 lacs.
	Add 3% W.C. Contingencies except L.S. items			49.39 lacs
	Add 2% for Consultancy Charges except L.S. items			32.85 lacs
	Grand Total:-			1728.77 lacs

Say Rs. 1728.80 lacs

Assistant Executive Engineer,
PWD(R&B) Sub Division No.II
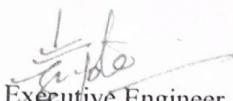Kathua

Executive Engineer
PWD(R&B) Division,
Kathua

th work Chart for Construction of Alternative alignment of Lakhanpur-Thein road, km 11th to 12th due to submergences of 2x39 mtr R.C.C .T. Girder Bridge on Nora Nallah (at 410.00 mtr level).
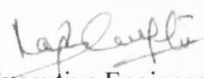
RD	Length m	Cutting				Filling			
		X-Area (M2)	T.Area (M2)	M.Area (M2)	Qty. (M3)	X-Area (M2)	T.Area (M2)	M.Area (M2)	Qty. (M3)
10/675	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/700	25	57.79	57.79	28.90	722.38	0.00	0.00	0.00	0.00
10/725	25	23.76	81.55	40.78	1019.38	4.56	4.56	2.28	57.00
10/750	25	6.00	29.76	14.88	372.00	6.00	10.56	5.28	132.00
10/775	25	12.97	18.97	9.49	237.13	0.00	6.00	3.00	75.00
10/800	25	8.45	21.42	10.71	267.75	0.75	0.75	0.38	9.38
10/825	25	10.20	18.65	9.33	233.13	0.50	1.25	0.63	15.63
10/850	25	16.14	26.34	13.17	329.25	0.64	1.14	0.57	14.25
10/875	25	8.54	24.68	12.34	308.50	1.37	2.01	1.01	25.13
10/900	25	22.05	30.59	15.30	382.38	2.25	3.62	1.81	45.25
10/925	25	15.50	37.55	18.78	469.38	3.71	5.96	2.98	74.50
10/950	25	13.50	29.00	14.50	362.50	2.10	5.81	2.91	72.63
10/975	25	20.18	33.68	16.84	421.00	0.84	2.94	1.47	36.75
11/0	25	7.17	27.35	13.68	341.88	3.51	4.35	2.18	54.38
11/25	25	12.30	19.47	9.74	243.38	0.82	4.33	2.17	54.13
11/50	25	4.80	17.10	8.55	213.75	0.37	1.19	0.60	14.88
11/75	25	4.20	9.00	4.50	112.50	3.57	3.94	1.97	49.25
11/100	25	9.20	13.40	6.70	167.50	3.97	7.54	3.77	94.25
11/125	25	9.56	18.76	9.38	234.50	10.87	14.84	7.42	185.50
11/140	15	14.62	24.18	12.09	181.35	1.80	12.67	6.34	95.03

	0	0.00	14.62	7.31	0.00	0.00	1.80	0.90	0.00
33	0	9.15	9.15	4.58	0.00	20.80	20.80	10.40	0.00
173	25	4.00	13.15	6.58	164.38	0.00	20.80	10.40	260.00
170	15	4.75	8.75	4.38	65.63	0.00	0.00	0.00	0.00
				Total	6849.60			Total	1364.90

Cutting = Rs.6850.00 cum   **Filling = Rs. 1365.00 cum**

Assistant Executive Engineer
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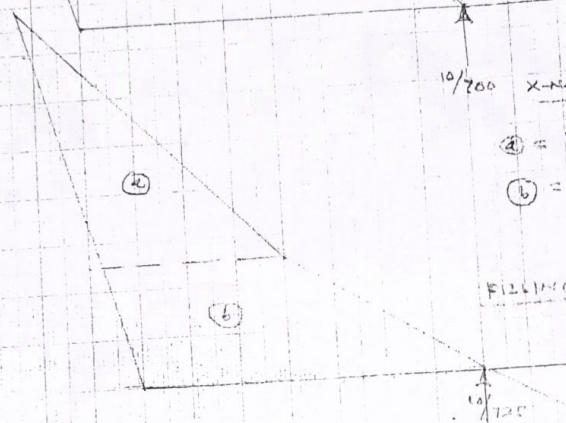Kathua

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PWD(R&B) Division
Kathua

X-NAL AREA AT R.D. 10/700 (CUTTING)

$a = \frac{1}{2} \times 2.50 \times 1.90 = 2.37 m^2$

$b = \frac{2.50 + 3.60}{2} \times 2.0 = 6.16 m^2$

$c = \frac{3.60 + 8.0}{2} \times 8.50 = 49.26 m^2$

$\underline{57.79 m^2}$
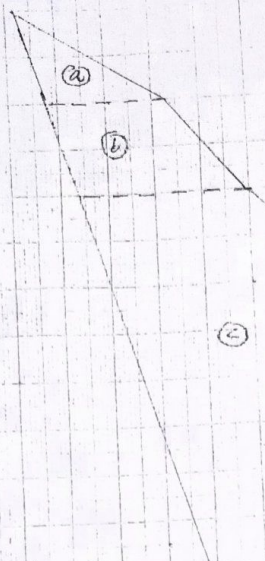
10/700

X-NAL AREA AT R.D. 10/725 (CUTTING)

$a = \frac{1}{2} \times 3.80 \times 5.40 = 10.26 m^2$

$b = \frac{3.80 + 7.0}{2} \times 2.50 = 13.50 m^2$

$\underline{23.76 m^2}$

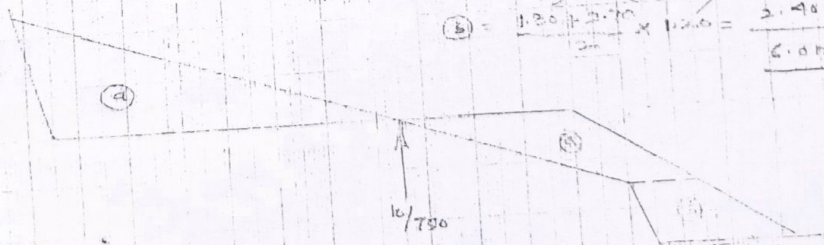FILLING

$a = \frac{3.50 + 2.20}{2} \times 1.60 = 4.56 m^2$

10/725

X-NAL AREA AT R.D. 10/750 (CUTTING)

$a = \frac{1}{2} \times 7.0 \times 2.40 = 8.40 m^2$

FILLING

$a = \frac{3.50 + 1.30}{2} \times 1.50 = 3.60 m^2$

$b = \frac{1.20 + 2.70}{2} \times 1.20 = 2.40 m^2$
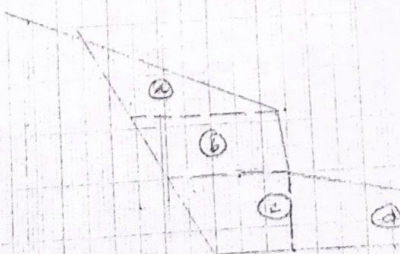
$\underline{6.0 m^2}$

10/750

X-NAL AREA AT R.D. 10/775

$a = \frac{1}{2} \times 2.80 \times 1.20 = 1.68 m^2$

$b = \frac{2.80 + 2.40}{2} \times 1.20 = 3.12 m^2$

$c = \frac{2.40 + 1.50}{2} \times 1.50 = 2.92 m^2$

$d = \frac{1}{2} \times 7.0 \times 1.50 = 5.25 m^2$

$\underline{12.97 m^2}$
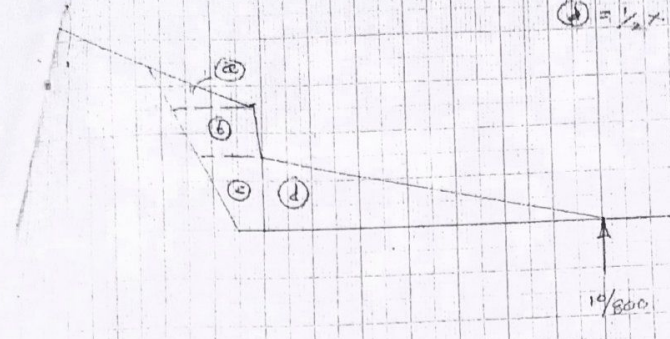
X-10/775

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X-NAL AREA AT RD 10/500 (CUTTING)

(a) = 1/3 × 1.50 × 0.60 =   0.45

(b) = (1.50 + 1.10)/2 × 1.0 =   1.40

(c) = (1.30 + 0.50)/2 × 1.50 =   1.35

(d) = 1/2 × 7.10 × 1.50 =   5.25
                                   (8.45)

FILLING   (a) = 1/2 × 1.0 × 1.50 = 0.75 m²

10/800

X-NAL AREA AT RD 10/825

(a) = 1/2 × 8.50 × 2.40 =   (10.20)

CUTTING:

(a) = 1/2 × 1.0 × 1.0 = 0.50 m²

10/825

X-NAL AREA AT RD 10/850

(a) = 1/2 × 4.70 × 1.30 =   3.05

(b) = (4.70 + 5.70)/2 × 0.50 =   2.60

(c) = (5.70 + 5.0)/2 × 1.40 =   7.49
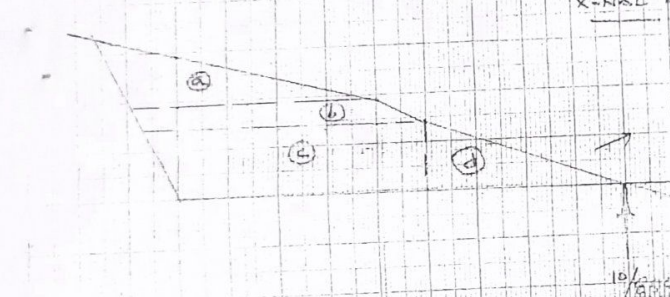
(d) = 1/2 × 4.0 × 1.50 =   3.00
                                  (16.14) m²

FILLING   (a) = 1/2 × 1.60 × 0.80 = 0.64 m²

10/850

X-NAL AREA AT RD 10/875

(a) = 1/2 × 2.60 × 1.0 =   1.30

(b) = (2.60 + 3.30)/2 × 1.50 =   4.42

(c) = (3.30 + 3.0)/2 × 0.50 =   1.57

(d) = 1/2 × 5.0 × 0.50 =   1.25
                                  (8.54)

Filling   (d) = 1/2 × 2.50 × 1.10 = 1.37 m²

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10/875

X-NAL AREA AT RD 10/900

(a) = 1/2 × 4.50 × 1.80 =   4.05

(b) = (4.50 + 7.50)/2 × 3.0 =   18.00
                                  (22.05)

FILLING

(a) = 1/2 × 3.0 × 1.50 = 2.25 m²

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Kathua

10/900
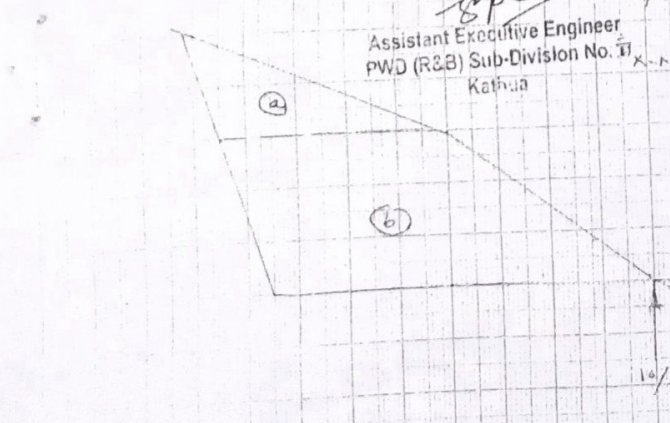
x-Sec Area Cutting at 10/925

ⓐ = $\frac{1}{2} \times 5.00 \times 1.40$ = 3.50

ⓑ = $\frac{5.00 + 7.00}{2} \times 2.00$ = 12.00

(15.50)

FILLING

ⓒ = $\frac{3.30 + 1.30}{2} \times 1.50$ = 3.45 m²

ⓓ = $\frac{1}{2} \times 1.30 \times 0.40$ = 0.26 m²

3.71 m²

A diagram labeled a, b, A, c, d at 10/925

x-Sec Area Cutting

ⓐ = $\frac{1}{2} \times 7.50 \times 3.60$ = (13.50)

FILLING

ⓑ = $\frac{1}{2} \times 3.0 \times 1.40$ = 2.10 m²

Diagram labeled a, b at 10/950

Area Cutting

ⓐ = $\frac{1}{2} \times 1.50 \times 0.60$ = 0.68

ⓑ = $\frac{1.60 + 3.70}{2} \times 2.00$ = 5.30

ⓒ = $\frac{3.70 + 3.50}{2} \times 4.00$ = 14.60

(20.18)

Diagram labeled a, b, c, d at 10/975

Filling area ⓓ = $\frac{1}{2} \times 2.80 \times 0.60$ = 0.84 m²

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Cutting Area $^{11}/0$

ⓐ $\frac{1.20+1.05}{2} \times 1.10$ = 4.65

ⓑ $\frac{1}{2} \times 4.20 \times 1.20$ = $\underline{2.52}$
$\boxed{7.17}$

Filling area

ⓒ = $\frac{1}{2} \times 4.50 \times 0.30$ = $0.67 m^2$

ⓓ = $\frac{1.30+0.80}{2} \times 2.70$ = $2.84 m^2$
$\overline{3.51 m^2}$

Naz Gora RD $^{11}/25$

CUTTING

ⓒ = $\frac{1}{2} \times 3.00 \times 0.20$ = 0.30

ⓒ = $\frac{3.00+4.80}{2} \times 1.50$ = 5.85

ⓒ = $\frac{4.8+7.50}{2} \times 1.00$ = $\underline{6.15}$
$\boxed{12.30}$

Filling area ⓐ = $\frac{1}{2} \times 3.0 \times 5.50$ = $0.75 m^2$

ⓑ = $\frac{1}{2} \times 0.20 \times 0.70$ = $\frac{0.070 }{}$
$\overline{0.92 m^2}$

RD $^{11}/50$

Hig ⓐ = $\frac{1}{2} \times 8.00 \times 1.20$ = $\boxed{4.80}$

Filling area = ⓐ = $\frac{1}{2} \times 2.50 \times 0.30$ = $0.37 m^2$

RD $^{11}/25$

cutting ⓐ = $\frac{1}{2} \times 7.00 \times 1.20$ = $\boxed{4.20}$

Filling ⓐ = $\frac{3.50+3.0}{2} \times \frac{1.0+1.20}{2}$ = $3.5 ? m^2$

X-NAL AREA AT
RD 11/100

WG (a) = $\frac{1}{2} \times 4.00 \times 4.60$ = (9.20)

FILLING (a) = $\frac{3.50 + 3.40}{2} \times \frac{1.0 + 1.30}{2}$ = $3.97 m^2$

X-NAL AREA AT
RD 11/125

CUTTING (a) = $\frac{1}{2} \times 3.40 \times 2.80$ = 4.76

(b) = $\frac{3.40 + 3.30}{2} \times 1.50$ = 4.80 (9.56)

11/125

FILLING (a) = $\frac{4.50 + 2.50}{2} \times 2.0$ = $7.0 m^2$

(b) = $\frac{2.50 + 2.9}{2} \times 1.50$ = $3.37 m^2$

(c) = $\frac{1}{2} \times 2.0 \times 0.56$ = $0.50 m^2$

$10.87 m^2$

X-NAL AREA
CUTTING

(a) = $\frac{1}{2} \times 7.50 \times 3.90$ = 14.62

11/140

FILLING : $\frac{1}{2} \times 3.0 \times 1.20$ = $1.80 m^2$

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Kathua

X-NAL AREA AT RD $^{11}/250$ CUTTING

$$\textcircled{a} = \frac{3.30 + 1.80}{2} \times 1.00 = 2.55 \text{m}^2$$

$$\textcircled{b} = \frac{3.30 + 5.50}{2} \times 1.50 = 6.60 \text{m}^2$$

$$\underline{5.15 \text{m}^2}$$

FILLING $\textcircled{a} = \frac{5.0 + 5.30}{2} \times 1.0 = 5.15 \text{m}^2$

$$\textcircled{b} = \frac{5.30 + 2.70}{2} \times 2.0 = 8.0 \text{m}^2$$

$$\textcircled{c} = \frac{2.70 + 2.0}{2} \times 3.0 = 7.05 \text{m}^2$$

$$\textcircled{d} = \frac{1}{2} \times 2.0 \times 0.60 = 0.60 \text{m}^2$$

$$\underline{20.8 \text{m}^2}$$

RD $^{11}/330$

$^{11}/355$

shed

X-NAL AREA AT RD $^{11}/275$ (CUTTING)

$$\textcircled{a} = \frac{5.0 + 3.0}{2} \times 1.00 = 4.0 \text{m}^2$$

$^{11}/370$

X-NAL AREA AT RD $^{11}/29C$

$$\textcircled{a} = \frac{1}{2} \times 0.60 \times 1.30 = 0.39 \text{m}^2$$

$$\textcircled{b} = \frac{0.60 + 1.40}{2} \times 0.70 = 0.70 \text{m}^2$$

$$\textcircled{c} = \frac{1.40 + 1.90}{2} \times 1.20 = 1.95 \text{m}^2$$
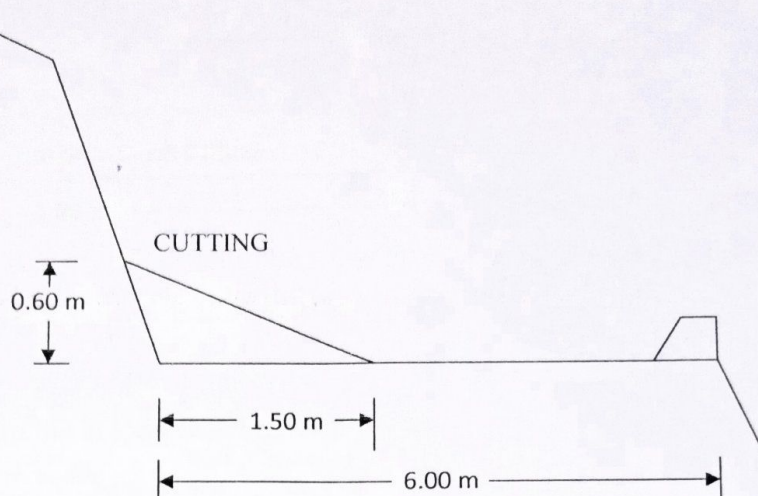
$$\textcircled{d} = \frac{1.50 + 1.10}{2} \times 1.0 = 1.34 \text{m}^2$$

$$\textcircled{e} = \frac{1.16 + 0.6}{2} \times 0.70 = 0.38 \text{m}^2$$

$$\underline{4.15 \text{m}^2}$$

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Assistant Engineer
PWD (R&B) Sub-Division No. II
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0.60 m

CUTTING

1.50 m

6.00 m

X-Section of Cutting

S.No.	Particulars of Items.	Amount.
1.	Earth work in bulk excavation by mechanical means (hydraulic excavator) over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 m2 on plan) including disposal of excavated earth lead upto 50 meters and lift upto 1.5 m, as directed by Engineer-in-Charge. All kinds of soil :	
	1 x 10.0 x ½ x 1.50 x 0.60 = **4.50 cum @ Rs.188.75**/ cum	Rs.849.00
2.	Disposal of excavated earth for an av. lead of 01 km Qty. vide item No.1= 4.50 cum	
	@ 40 % qty.= **1.80 cum @ Rs.148.44/ cum**	Rs. 267.00
		Total:- Rs.1116.00

Cost per cum = Rs.248.04

Say Rs. 250.00/cum

Asstt. Executive Engineer

Executive Engineer
PWD(R&B) Division
Kathua

TYPICAL ESTIMATE FOR CONSTRUCTION OF ROAD BY WAY OF EARTH FILLING

6.00 m

0.60   Earth Filling

7.80 m
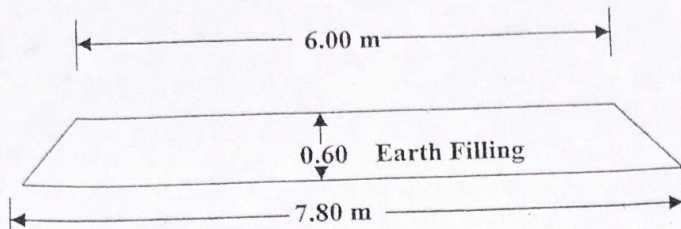
X-section of Earth Filling

S. No. Particulars

Amount

1.   Excavating, supplying and filling of local earth (including royalty)by mechanical transport upto a lead of 5 km also including ramming and watering of the earth in layers not exceeding 20 cm in trenches, plinth, sides of foundation etc. complete.
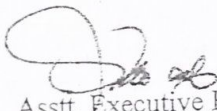
$$1 \times 10.00 \times \frac{6.00 + 7.80}{2} \times 0.60 = \textbf{41.40 cum}$$

@ **Rs. 272.45/cum**

Rs.11279.00

T = **Rs.11279.00**

Cost per cum = Rs.272.45

Say = Rs. 275.00/Cum

Asstt. Executive Engineer

Executive Engineer
PWD(R&B) Division
Kathua

TYPICAL ESTIMATE FOR PROVIDING & LAYING GRANULAR SUB-BASE MATERIAL (GSB)

S.No.	Particulars	Amount

1. Construction of granular sub-base by providing close graded Material conforming to specifications, mixing in a mechanical mix plant at OMC, carriage of mixed material by tippers to work site, for all leads & lifts, spreading in uniform layers of specified thickness with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per specifications and directions of Engineer-in-Charge. With material conforming to Grade-I (size range 75 mm to 0.075 mm) having CBR Value-30

$$1 \times 1000 \times 3.00 \qquad = 3000 \text{ sqm}$$
$$\text{Add 10\% for curves} \quad = \underline{300 \text{ sqm}}$$
$$\qquad\qquad\qquad 3300 \text{ sqm} \times 0.25 = 825.00 \text{ cum}$$
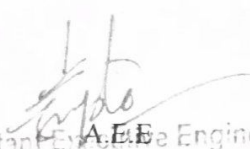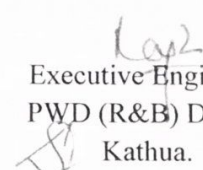
@ Rs.1081.05/cum   Rs. 891866.00

Total : Rs. 891866.00

Cost per Cum = Rs. **1081.05**

Say Rs. 1080.00/m³

Assistant Executive Engineer,
PWD (R&B) Sub-Division No. II
Kathua
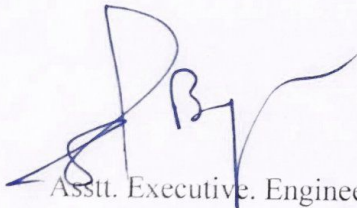
Executive Engineer,
PWD (R&B) Division
Kathua.
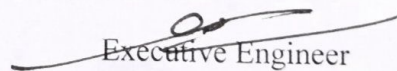
Typical Estimate for Providing and laying Wet Mix Macadam

S.No.	Particular of items	Amount (In Rs.)
1.	Providing, laying, spreading and compacting graded stone aggregate (size range 53 mm to 0.075 mm) to wet mix macadam (WMM) specification including premixing the material with water at OMC in mechanical mix plant, carriage of mixed material by tipper to site, for all leads & lifts, laying in uniform layers with mechanical paver finisher in sub- base / base course on well prepared surface and compacting with vibratory roller of 8 to 10 tonne capacity to achieve the desired density, complete as per specifications and directions of Engineer-in-Charge.	

1 x 1000 x 3.00 = 3000.00 sqm

Add 5% for curves = 150.00 sqm

Total = 3150.00 sqm x 0.075 = Rs. 236.25 cum

@ Rs. 1041.50/cum   Rs. 246054.00

2. Earth filling in berms including supply and carriage etc.

2 x 1000.00 m x 1.00 m x 0.075 m =150.00 cum @ Rs.250.00/cum   Rs. 37500.00

(L.M.R.)

Total :-   Rs.283554.00

Cost per Cum = Rs.1200.23

Say Rs. 1200.00/cum

Asstt. Executive. Engineer

Executive Engineer
PWD(R&B)Division
Kathua.

TYPICAL ESTIMATE FOR PROVIDING AND LAYING 50MM THICK BITUMINOUS PENETRATION MACADAM

S.No.	Particulars of Items	Amount

1. Providing and laying bituminous macadam using crushed stone aggregates of specified grading premixed with bituminous binder, transported to site by tippers, laid over a previously prepared surface with paver finisher equipped with electronic sensor to the required grade, level & alignment and rolling with smooth wheeled, vibratory & tandem rollers as per specifications to achieve the desired compaction and density, complete as per specifications and directions of Engineer-in-Charge.50 to 100 mm average compacted thickness with bitumen of grade VG-30 @ 3.5% (percentage by weight of total mix) prepared in Batch Type Hot Mix Plant of 100-120 TPH capacity.

   1000.00 m x 3.75 m =   3750.00 sqm

   Add 10% for curves =   375.00 sqm

            Total: 4125.00 x0.05 = 206.25 cum

                    @ **Rs. 5996.55/cum**   Rs. 1236788.00

2. Providing and applying tack coat using hot straight run bitumen of grade –VG-10, including heating the bitumen, spraying the bitumen with mechanically operated spray unit fitted on bitumen boiler, cleaning and preparing the existing road surface as per specifications. on W.B.M. @ 0.75 Kg/sqm

   Qty vide item No. (1) = 4125.00 sqm @ 55.45/sqm   Rs. 228731.00

3. Earth filling in berms including supply and carriage etc.

   2 x 1000.00 m x 1.00 m x 0.05 m =100.00 cum @ Rs.350.00/cum   Rs. 35000.00

                                  (L.M.R.)
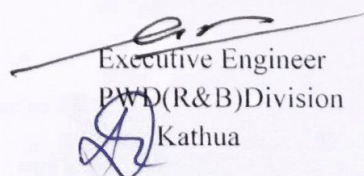
                                 Total: Rs .1500519.00

   Cost per Km = Rs. 15.00 lacs

   Cost per cum = Rs. 7272.72

   Say Rs 7250.00/cum

A.E.E
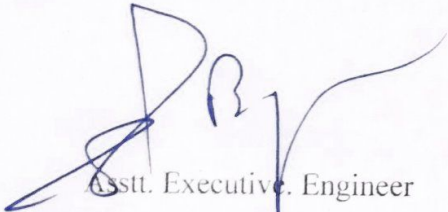
Executive Engineer
PWD(R&B)Division
Kathua
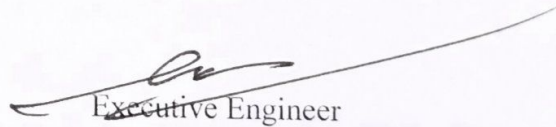
Typical Estimate for Providing and laying 25 mm thick Semi Dense Bituminous Concrete.

S.No.	Particular of items	Amount

3. Providing and applying tack coat using hot straight run bitumen of grade –VG-10, including heating the bitumen, spraying the bitumen with mechanically operated spray unit fitted on bitumen boiler, cleaning and preparing the existing road surface as per specifications. on W.B.M. @ 0.75 Kg/sqm.

    1 x 1000 x 3.75   = 3750 sqm

    Add 10% for curves = <u>375 sqm</u>

                        4125 sqm @ Rs. 55.45/sqm   228731.00

4. Providing and laying 25 mm thick (compacted) Semi- Dense Bituminous concrete using crushed stone aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot mix to work site by tippers, laying with paver finisher equipped with electronic sensor to the required grade, level and alignment and rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction and density as per specification, complete and as per directions of Engineer-in-Charge. with bitumen of grade VG- 30 @5% (percentage by weight of total mix) and lime filler @ 2% (percentage by weight of Aggregate) prepared in Batch Type Hot Mix Plant of 100-120 TPH capacity.

    Area vide item No. 1   = 4125 sqm @ 205.95 kg/sqm   <u>849544.00</u>

                                      Total :-   **1078275.00**

Cost per sqm = Rs. 261.40

Say Rs. 260.00/sqm.

Asstt. Executive. Engineer

Executive Engineer
PWD(R&B)Division
Kathua.

TYPICAL ESTIMATE FOR THE CONSTRUCTION OF 3.00 MTR SPAN RCC CULVERT

S.No.	Particular of Items.	Amount.

1. Earth Work in excavation by mechanical means (Hydraulic excavator) in trenches for foundations, drains, pipes and cables etc. (not exceeding 1.5 mtr in width or and the like not exceeding 10 sqm on plan, including dressing of sides and ramming of bottoms lift upto 1.5 m, including getting out excavated earth and disposal of surplus excavated earth as directed, within a lead of 50 metres in all kinds of soil

Abutments 1 x 7.00 x 7.70 x 1.70 = 91.63 cum
Wing walls: 4 x 2.40 x 2.00 x 1.40 = 26.88 cum

Crates :-2 x 6.00 x 1.20 x 1.20 = 17.28 cum

Total :- **135.79 cum @ Rs. 252.05/cum   Rs. 34226.00**

2. Providing and laying in position cement conc. of specified grade incl curing but excl. the cost of centering and shuttering – All work upto plinth level with 1:4:8 (1 cement : 4 fine sand :8 graded stone agg. 40mm nominal size)

Abutment:- 1 x 7.00 x 7.70 x 0.20 = 10.78 cum
Wing Walls:- 4 x 2.40 x 2.00 x 0.20 = 3.84 cum
Under floors 1 x 6.30 x 1.80 x 0.15 = 1.70 cum

Total:- = **16.32 cum @ Rs. 4419.85/cum   Rs. 72132.00**

3. Providing and laying cement conc. in retaining walls, return walls, walls, (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or laces, courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets etc. upto floor five level, excluding the cost of centering shuttering and finishing. 1:3:6 (1 cement :3 coarse sand :6 graded stone agg. 20 mm nominal size)

Abutments :-

Ist Step :-	2 x 1.90 x 6.90 x 0.40	= 10.48 cum -A
2nd Step :-	2 x 1.50 x 6.50 x 0.40	= 7.80 cum -A
3rd step :-	2 x 1.30 x 6.50 x 0.40	= 6.76 cum -A
4th step :-	2 x $\frac{1.20 + 0.80}{2}$ x 6.00 x 1.50	= 18.00 cum

Wings :-

Ist step :-	4 x 2.00 x 2.20 x 0.40	= 7.04 cum - A
2nd step :-	4 x 1.60 x 2.40 x 0.40	= 6.14 cum - A
3rd step :-	4 x 2.60 x $\frac{1.60 + 1.20}{2}$ x 0.40	= 5.82 cum - A
4th step :-	4 x 2.80 x $\frac{1.20 + 0.50}{2}$ x 1.95	= 18.56 cum

Parapets :-   2 x 4.60 x $\frac{0.60 + 0.45}{2}$ x 0.60=2.90 cum

Total :- **83.50 cum.**

=83.50-44.04(A)   = 39.46 cum @ Rs. 6608.35/cum   Rs.260765.00
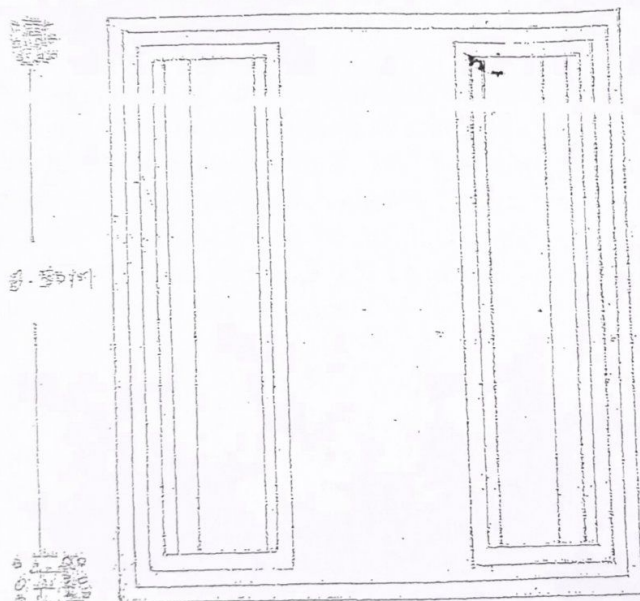**Upto plinth level qty marked A = 44.04 cum @ Rs.4943.40/cum**   Rs. 217707.00

S.No.	Particular of Items.	Amount.

4. Providing and laying in position cement
concrete of specified grade including curing
but excluding the cost of centring and shuttering.
All work upto plinth level with:1:2:4 (1 cement :
2 coarse sand   :4 graded stone agg. 20 mm nominal
size)

Raft :-   1 x 6.20 x 7.30 x 0.40   = 18.10 cum
Bed plate :- 2x 0.80 x 6.00 x 0.15   = 1.44 cum
              2 x 0.50 x 6.00 x 0.30 = 1.80 cum

Total : **21.34 cum @Rs. 5877.45/cum Rs.125425.00**

5. Providing and laying in position specified grade of
reinforced cement concrete incl curing but excluding
the cost of centering, shuttering, finishing and
reinforcement all work upto plinth level 1:1.5:3
(1 cement :1.5 coarse sand :3 graded stone agg.
20 m nominal size)

Slab   :- 1 x 3.60 x 6.00 x 0.30 = 6.48 cum
Wheel Guard :-2 x 4.60 x 0.25 x 0.60   = 1.38 cum

Total :**7.86 cum @ Rs.7091.60/cum Rs.55740.00**

6. Providing and laying damp-proof Course 50 mm thick
with cement concrete 1:2:4 (1cement:2 coarse sand: 4
graded stone aggregate 20 mm nominal size) and curing
complete

Bed floor   = 1 x 7.50 x 3.00 = **22.50 sqm @ Rs. 372.85/sqm.**   **Rs.8389.00**

7. Steel reinforcement for R.C.C. work including straightening,
cutting, bending, placing in position and binding all complete
upto plinth level Cold twisted bars..

Qty. vide item no.4 = 21.34cum @ Rs.50 kg/cum = 1067.00 kg
Qty. vide item no.5 = 7.86 cum @ Rs. 125/cum = 983.00 kg

Total : **2050.00 kg**
@ 79.25/Kg   **Rs.162463.00**

8. Centering & shuttering including strutting, propping etc
removal of form work for

a) Foundations, footings, bases of columns etc for mass concrete
Raft;   2 x (6.20 + 7.30) x 0.40   = 10.80 sqm
Abuts

Ist Step :- 2 x 2 (1.90 + 6.90) x 0.40   = 14.08 sqm
2nd step :- 2 x 2 (1.50 + 6.50) x 0.40   = 12.80 sqm
3rd step :- 2 x 2 (1.30 + 6.50) x 0.40   = 12.48 sqm
Wings:- Ist step :4 x1 (2 x 2.20+2.00) x0.40 = 10.24 sqm
2nd step :- 4 x 1 (2 x 2.40 + 1.60) x 0.40   = 10.24 sqm
3rd step :- 4 x 1 (2 x 2.60 +1.40) x 0.40   = 10.56 sqm

Total : **81.20 sqm**
@ Rs.262.30/sqm   **Rs.21299.00**

b) Columns ,Pillars, Piers, Abutments, posts & Struts.

Abuts:- 2 x 2 x 6.00 + $\dfrac{(1.30 +0.80)}{2}$ x 1.50 = 42.30 sqm

Wings   4 x 1 x $\dfrac{1.20 + 0.50}{2}$ x 1.95   = 6.63 sqm

4 x 2 x 2.80 x 1.95   = 43.68 sqm

Total :-   **92.31 sqm@ Rs. 680.15/sqm Rs. 62785.00**

S.No.	Particular of Items.	Amount.
c)	Suspended floors, roofs, landings, balconies and access platforms.	
:	1 x 3.00 x 6.00 = **18.00 sqm@ Rs 635.60/sqm**	**Rs. 11441.00**
d)	Edges of slabs and breaks in floors and walls above 20 cms wide	
	Slab:- 2 x (4.60 +6.00) x 0.30 = 6.36 sqm	
	2 x 2 (0.80 + 6.00) x 0.15 = 4.08 sqm	
	Bed plate :- 2 x 2 (4.60 + 0.25) x 0.60 = 11.64 sqm	
	Total : **22.08 sqm @ Rs. 1073.00/sqm**	**Rs. 23692.00**
9.	Dumping stones behind abutments and walls in horizontal on level incl. Supply of stones.	

Abutment :- 2x 6.00 x $\dfrac{0.40 + 1.50}{2}$ x 2.80 = 31.92 cum

Wings :- 2x 2x 1.00x $\dfrac{1.20 + 0.40}{2}$ x 3.60 = 11.52 cum

<div align="right">

Total = **43.44 cum @ Rs. 676.40/cum**   **Rs. 29383.00**

</div>

10.	Hand Packing stone in wire crates incl. the cost of stones but excluding	
:	the cost of wire crates	
	2x 6.00x 1.20x 1.20 = **17.28 cum @ Rs. 797.45/cum**	**Rs.13780.00**

11. Carriage of materials by M.T incl. loading, unloading and stacking at site complete.

a)   Stone aggregate below 40 mm nominal size for an avg. lead of 5 kms.

Qty. vide item no. 2 = 16.32 cum
Qty. vide item no. 3 = 83.50 cum
Qty. vide item no. 4 = 21.34 cum
Qty. vide item no. 5 = 7.86 cum

<div align="center">

Total :- 129.02 cum @ 90%   = 116.11 cum

</div>

Qty Vide item No.6 = 22.50 sqm @ 0.044 cum/sqm = 0.99 cum

<div align="right">

= **117.10 cum**

@ Rs 179.37/cum   **Rs.21004.00**

</div>

b)   Sand for an avg lead of 5 kms .

Qty. vide item no. 11 a = 117.10 cum @ 50% = **58.55 cum**

<div align="right">

@ **Rs. 179.37/cum**   **Rs. 10502.00**

</div>

c)   Stones for an avg lead of 5 Kms

Qty. vide item no. 9 = 43.44 cum
--do--   10 = 17.28 cum

<div align="right">

Total : **60.72 cum @ Rs.211.02 /cum**   **Rs.12813.00**

Total: Rs. 1143546.00

Add cost of wire crates = 2 Nos. @ Rs. 5000/No.   **Rs. 10000.00**

Total :-   **Rs 1153546.00**

</div>

<div align="center">

Say Rs.11.54 lacs

</div>

Assistant Executive Engineer

<div align="right">

Executive Engineer
PWD(R&B)Division
Kathua.

</div>

0·40 0·40   3·0M   0·40 0·40

C. Conc. In M-20 Grade
C. Conc. In M-15 Grade
C. Conc. In M-10 Grade

1·20
1·50
1·30

C. Conc. In M-7·5 Grade

X-SEC. OF ABUTMENT
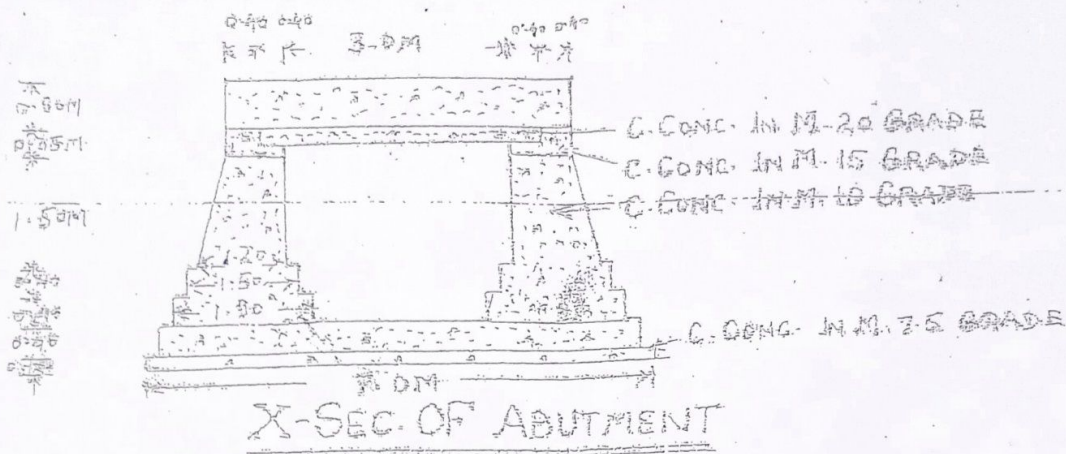
PLAN

Executive Engineer
P.W.D. (R&B) Division
Kathua

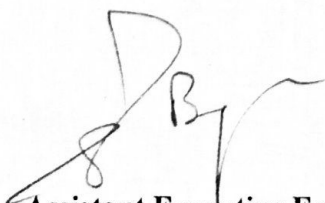TYPICAL DRAWING FOR CONST. OF
3·0 Mt SPAN R.C.C. CULVERT

A.E.E.

SEC. OF WING WALL
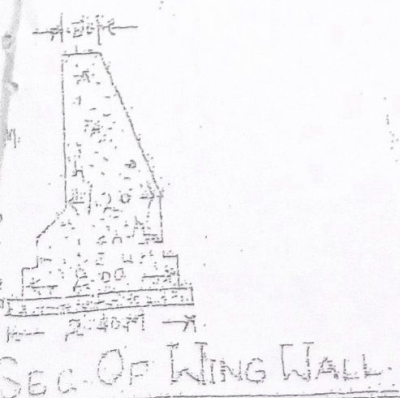
TYPICAL ESTIMATE FOR THE CONSTRUCTION OF 2.00 MTR SPAN RCC CULVERT

S.No.	Particular of Items.	Amount.

1. Earth Work in excavation by mechanical means (Hydraulic excavator) in trenches for foundations, drains, pipes and cables etc. (not exceeding 1.5 mtr in width or and the like not exceeding 10 sqm on plan, including dressing of sides and ramming of bottoms lift upto 1.5 m, including getting out excavated earth and disposal of surplus excavated earth as directed, within a lead of 50 metres in all kinds of soil

Abutments 1 x 8.70 x 5.70 x 1.50   = 74.38 cum
Wing walls: 4 x 2.70 x 2.40 x 1.50   = 38.88 cum
Crates :-2 x 6.00 x 1.20 x 1.20   = 17.28 cum

              Total :-   130.54 cum   @ Rs. 252.05/cum   Rs. 32902.00

2. Providing and laying in position cement conc. of specified grade incl curing but excl. the cost of centering and shuttering – All work upto plinth level with 1:4:8 (1 cement : 4 fine sand :8 graded stone agg. 40mm nominal size)

Abutment:- 1 x 8.70 x 5.70 x 0.20   = 9.91 cum
Wing Walls:- 4 x 2.40 x 2.00 x 0.20   = 3.84 cum
Under floors 1 x 6.30 x 1.80 x 0.15   = 1.70 cum

              Total:-   15.45 cum   @ Rs. 4419.85/cum   Rs. 68287.00

4. Providing and laying cement conc. in retaining walls, return walls, walls, (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or laces, courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets etc. upto floor five level, excluding the cost of centering shuttering and finishing. 1:3:6 (1 cement :3 coarse sand :6 graded stone agg. 20 mm nominal size)

Abutments :-

Base :-   1 x 8.70 x 5.70 x 0.40   = 19.83 cum - A
Ist Step :-   2 x 8.30 x 1.90 x 0.40   = 12.61 cum - A
2nd step :-   2 x 7.90 x 1.50 x 0.40   = 9.48 cum - A
3rd step :-   2 x 7.50 x $\dfrac{0.80 + 1.30}{2}$ x 1.50   = 23.62 cum

Wings :-

Ist step :-   4 x 2.00 x 2.00 x 0.40   = 6.40 cum - A
2nd step :-   4 x 2.20 x 1.60 x 0.40   = 5.63 cum - A
3rd step :-   4 x 2.40 x $\dfrac{1.20 + 1.60}{2}$ x 0.40   = 5.37 cum - A
4th step :-   4 x 2.80 x $\dfrac{0.50 + 1.20}{2}$ x 1.80   = 17.13 cum

C/wall:-   2 x 1.60 x 0.60 x 0.40   = 0.76 cum- A
Drop wall :-   2 x 1.80 x 0.60 x 0.40   = 0.86 cum- A
Parapets :-   2 x 3.60 x $\dfrac{0.60 + 0.45}{2}$ x 0.60   = 2.26 cum- A

               2 x 7.50 x 0.40 x 0.40   = 2.40 cum- A

                         Total :-   106.35 cum

=106.35-65.60(A)   = 40.75 cum @ Rs. 6608.35/cum   Rs.269290.00
Upto plinth level qty marked A = 65.60 cum @ Rs.4943.40/cum   Rs. 324287.00

S.No.	Particular of Items.	Amount.

4. Providing and laying in position specified grade of reinforced cement concrete incl curing but excluding the cost of centering , shuttering, finishing and reinforcement all work upto plinth level 1:1.5:3 (1 cement :1.5 coarse sand :3 graded stone agg. 20 mm nominal size)

Bed plate :-   2 x 7.50 x 0.40 x 0.15 = 0.90 cum
Slab :-   1 x 7.50 x 2.80 x 0.25 = 5.25 cum
Wheel guard: 2 x 3.60 x 0.30 x 0.60 = 1.30 cum

                    Total :-   7.45 cum   @ Rs. 7091.60/cum   **Rs. 52832.00**

5. Providing and laying DPC 50 mm thick with cement Conc. 1 : 2 : 4 (1 cement : 2 coarse sand : 4 graded stone agg. 20 mm   nominal size)(Crushed)

Bed floor   = 1 x 7.50 x 2.00   = 15.00 sqm @ Rs. 372.85/sqm.   **Rs.5593.00**

6. Reinforcement for RCC Work incl. straightening, cutting, bending, placing in position and binding all complete Cold twisted bars..

Qty. vide item no. 4 = 7.45 cum @ **125 kg/cum = 930 kg @ 79.25/kg**   **Rs. 73702.00**

7. Centering & shuttering including strutting, propping etc & removal of form work for

a) Foundations, footings, bases of columns etc for mass concrete

Abutments	2 x 7.50 x 0.20	= 3.00 sqm
Sides	2 x 2 x 7.50 x 0.80	= 24.00 sqm
	4 x 7.50 x 1.20	= 36.00 sqm
Faces	2 x 2 x 2.60 x 0.40	= 4.16 sqm
	$2 \times 2 \times \dfrac{2.60 + 2.20}{2} \times 0.40$	= 3.84 sqm
	$2 \times 2 \times \dfrac{1.85+0.75}{2} \times 1.20$	= 6.24 sqm
D/wall	2 x 2 x 7.50 x 0.40	= 12.00 sqm
---do--- 2nd	$2 \times 2 \times \dfrac{0.45 + 0.30}{2} \times 0.40$	= 0.60 sqm
Bed plate :-	2 x 7.50 x 0.15	= 2.25 sqm
	2 x 2 x 0.30 x 0.15	= 0.18 sqm
wing wall :-	2 x 4 x 4.40 x 1.00	= 35.20 sqm
	2 x 4 x 1.70 x 0.80	= 10.88 sqm
	$4 \times \dfrac{(1.70 + 0.50)}{2} \times 1.20$	= 5.28 sqm

                    Total : 143.63 sqm@ Rs. 262.30/sqm   **Rs. 37674.00**

b) Columns ,Pillars, Piers, Abutments, posts & Struts.

Abutments	4 x 7.50 x 1.65	= 49.50 sqm
	$2 \times 2 \times \dfrac{1.85 +0.75}{2} \times 1.65$	= 8.58 sqm
Wing Wall	2 x 4 x 1.70 x 1.80	= 24.48 sqm
	$2 \times 4 \times \dfrac{1.70 + 0.50}{2} \times 1.80$	= 15.84 sqm

                    Total :   98.40 sqm @ Rs. 680.15/sqm   **Rs.66927.00**

c) Suspended floors, roofs, landings, balconies and access platforms etc.

        1 x 7.50 x 2.0 = **15.00 sqm** @ Rs. 635.60/sqm   **Rs. 9534.00**

d)   Edges of slabs and breaks in floors and walls above 20cms wide

$2 \times (7.50 + 2.80) \times 0.25$ = 5.15 sqm

$2 \times 2(7.50 + 0.40) \times 0.25$ = 7.90 sqm

Bed plate :- $2 \times 2(7.50 + 0.40) \times 0.15$ = 4.74 sqm

Total :- 17.79 sqm @ Rs. 1073.00/sqm   Rs.19088.00

8.   Dumping stones behind abutments and walls in horizontal on level incl. Supply of stones.

Abutment = $2 \times 7.50 \times \dfrac{0.40 + 1.50}{2} \times 2.85$ = 40.61 cum

Wings: $2 \times 2 \times 1.00 \times \dfrac{1.20 + 0.40}{2} \times 3.60$ = 11.52 cum

Total :- 52.13 cum @ Rs. 676.40/cum   Rs 35260.00

9.   Hand Packing stone in wire crates incl. the cost of stones but excluding the cost of wire crates

$2 \times 6.00 \times 1.20 \times 1.20$ = **17.28 cum @ Rs. 797.45/cum**   Rs. 13800.00

10.   Carriage of materials by M.T incl. loading, unloading and stacking at site complete.

a)   Stone aggregate below 40 mm nominal size for an avg. lead of 5 kms.

Qty. vide item no. 2 = 15.45 cum

Qty. vide item no. 3 = 106.35 cum

Qty. vide item no. 4 = 7.45 cum

Total : 129.25 cum @ 90% = 116.32 cum

Qty Vide item No.5 = 15.00 sqm @ 0.044 cum/sqm = 0.66 cum

= **116.98 cum**

@ Rs.179.37/cum   Rs. 20982.00

b)   Sand for an avg lead of 5 kms

Qty. vide item no. 10 (a) = 116.98 cum @ 50 % = **58.49 cum**

@ Rs. 179.37/cum   Rs. 10491.00

c)   Stones for an avg lead of 5 kms.

Qty. vide item no. 8 = 52.13 cum

Qty. vide item no. 9 = 17.28 cum

Total :- 69.41 cum   Rs. 211.02 /cum   Rs. 14647.00

         Total :-   Rs. 1055296.00

Add cost of wire crates 02 nos. @ Rs. 5000/E   Rs. 10000.00

         G. Total :-   Rs.1065296.00

Say Rs 10.65 lacs

Assistant Executive Engineer,

Executive Engineer
PWD(R&B)Division
Kathua.

PARAPET

R.C.C. SLAB

C. CONC 1:2:5 GRADE

0.60 2. om

30
50
90 1:3:6

C. CONC 1 ABUTMENT

2. 00 5.70M 2. 00

X-SEC OF ABUTMENTS

1.50

C. CONC
1:3:6 MIX 2.20

1.65 80

A' A' 12

C. CONC 1:4:8
2.40

1.200

X-SEC OF WING WALL

Executive Engineer
P.W.D. (R&B) Division
Kathua

2.00

2.00

PLAN

DRAWING FOR CONSTT OF 2.00 M SPAN RCC CULVERT

A.E.E.
Kathua
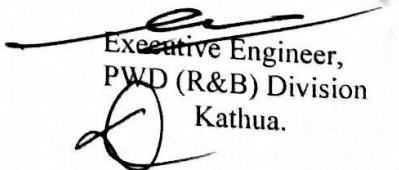
TYPICAL ESTIMATE FOR THE CONSTRUCTION OF RETAINING WALL
(FOR 10.00 M LENGTH)

S.No.	Particular of Items.	Amount.

1. Earth Work in excavation by mechanical means (Hydraulic excavator) in trenches for foundations, drains, pipes and cables etc. (not exceeding 1.5 mtr in width or and the like not exceeding 10 sqm on plan, including dressing of sides and ramming of bottoms lift upto 1.5 m, including getting out excavated earth and disposal of surplus excavated earth as directed, within a lead of 50 metres in all kinds of soil

$1 \times 10.00 \times \dfrac{0.30 + 1.20}{2} \times 1.20$ = **9.00 cum** @ 252.05/cum **= Rs. 2268.00**

2. Providing and laying in position cement concrete of specified grade including curing but excluding the cost of centring and shuttering. All work upto plinth level with:1 : 5 :10 (1 cement :5 coarse sand 10 graded stone agg. 40 mm nominal size)

$1 \times 10.00 \times 1.20 \times 0.15$ = **1.80 cum** @ 4029.15/cum **= Rs. 7252.00**

3 Providing and laying cement conc. in retaining walls, return walls, walls, (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or laces, courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets etc. upto floor five level, excluding the cost of centering shuttering and finishing. 1:3:6 (1 cement :3 coarse sand :6 graded stone agg. 20 mm nominal size)

$1 \times 10.00 \times \dfrac{0.45 + 1.20}{2} \times \dfrac{3.00+3.30}{2}$ = 25.98 cum

concrete @ 70% = **18.19 cum**

@ Rs. 6608.35/cum **= Rs.120205.00**

2. Centering and shuttering including strutting, propping etc. and removal of form for: Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.

$1 \times 10.00 \times \dfrac{3.30 + 3.00}{2}$ = 31.50 sqm

$2 \times \dfrac{0.45 + 1.20}{2} \times 3.00$ = 4.95 sqm

= 36.45 @ Rs. 573.85/Sqm **= Rs.20917.00**

5 Dumping stones behind abutments and walls in horizontal on level incl. Supply of stones.

$1 \times 10.00 \times \tfrac{1}{2} \times 0.80 \times 2.25$ = 9.00

Qty. vide Item No. 3 = 25.98 @ 30% = 7.80 cum

= **16.80** @Rs.676.40/ cum **= Rs. 11363.00**

6.. Carriage of material by M.T. incl. loading, unloading & stacking complete

a) Stone agg. below 40mm nominal size for an avg. lead of 5 Kms

Qty. vide item no. 2 = 1.80 cum

Qty. vide item No. 3 = 18.19 cum

= **19 .99 cum** @ 90% = 17.99 cum @Rs.179.37/cum = **Rs.3227.00**

b) Stones for an av.lead of 5 kms

Qty. vide item no. 5 = 16.80 cum @ Rs.179.37/cum **= Rs.30134.00**

c) Sand for an av. lead of 5 kms

Qty. vide item no. 6(A) = 17.99 cum @50% = 9.00 cum@ Rs.179.37/ cum = **Rs.1614.00**

Total:- = Rs.196980.00

Cost per Rmt = Rs. 19698/Rmt.

Say Rs. 19700.00/Rmt

Assistant Executive Engineer

Executive Engineer,
PWD (R&B) Division
Kathua.

0.30

0.85

C. Conc.
M-10
grade

0.60 M

3.00M

3.30M

1.35M

C. Conc.
M-7.50 G.

SEC. OF R/WALL
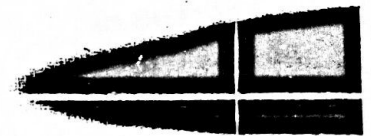
Assistant Executive Engineer.
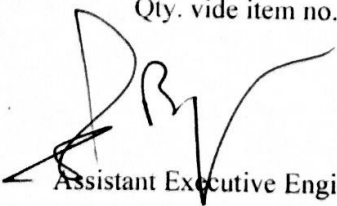PWD (R&B) Sub Division No. 0
Kathua

Executive Engineer
P.W.D. (R&B) Division
Kathua

TYPICAL ESTIMATE FOR THE CONSTRUCTION OF BREAST WALL (FOR 10.00 M LENGTH)
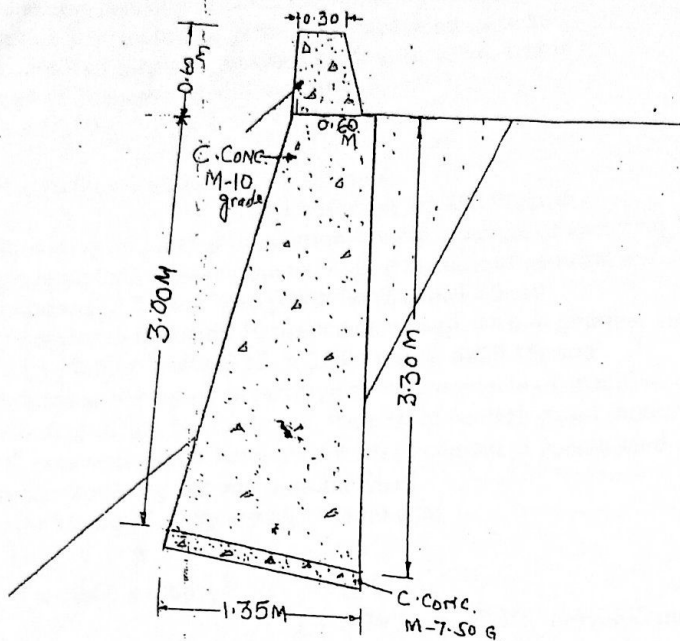
S.No.	Particular of Items.	Amount.

1. Earth Work in excavation by mechanical means (Hydraulic excavator) in trenches for foundations, drains, pipes and cables etc. (not exceeding 1.5 mtr in width or and the like not exceeding 10 sqm on plan, including dressing of sides and ramming of bottoms lift upto 1.5 m, including getting out excavated earth and disposal of surplus excavated earth as directed, within a lead of 50 metres in all kinds of soil

$1 \times 10.00 \times \dfrac{1.00}{2} \times 1.50 = 7.50$ cum

$1 \times 10.00 \times 1.60 \times 0.60 = \underline{9.60}$ cum

$T = 17.10$ cum @ 252.05/cum   **Rs.4310.00**

2. Providing and laying in position cement concrete of specified grade including curing but excluding the cost of centring and shuttering. All work upto plinth level with:1 : 5 :10 (1 cement :5 fine sand 10 graded stone agg. 40 mm nominal size)

$1 \times 10.00 \times 1.60 \times 0.15 = 2.40$ cum @ 4029.15/cum   **Rs.9670.00**

3 Providing and laying in position cement concrete of specified grade including curing but excluding the cost of centering and shuttering. All work upto plinth level with 1:3:6 (1 cement :3 coarse sand :6 graded stone agg. 20 mm nominal size)

$= 1 \times 10 \times \dfrac{0.75 + 0.85}{2} \times 0.60 = 4.50$ cum

$1 \times 10.00 \times 0.60 \times 0.20 = \underline{1.20}$ cum

$T = 5.70$ cum @ Rs. 4943.40/cum   **Rs.28177.00**

4. Providing and laying cement conc. in retaining walls, return walls, walls, (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or laces, courses, parapets,coping, bed blocks, anchor blocks, plain window sills, fillets etc. upto floor five level, excluding the cost of centering shuttering and finishing. 1:3:6 (1 cement :3 coarse sand :6 graded stone agg. 20 mm nominal size)

$1 \times 10.00 \times \dfrac{0.45 + 0.75}{2} \times 1.50 = \underline{8.62}$ cum

$= 8.62$ Cum @ Rs.6608.35/cum   **Rs. 56965.00**

5. Centering and shuttering including strutting, propping etc. and removal of form for:

b) Foundations, footings, bases of columns etc. for mass concrete.

$2 \times 2 \times 10.00 \times 0.60 = 24.00$ sqm@ **Rs. 262.30/Sqm**   **Rs.6295.00**

c) Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.

$2 \times 10.00 \times 1.50 = 30.00$ sqm@ **Rs. 573.85/Sqm**   **Rs.17215.00**

6. Carriage of material by M.T. incl. loading, unloading & stacking complete

a) Stone agg. below 40mm nominal size for an avg. lead of 10 Kms

Qty. vide item no. 2 = 2.40 cum

Qty. vide item No. 3 = 5.70 cum

Qty. vide item No. 4 = $\underline{8.62}$ cum

$= 16.72$ cum @90% = 15.04 cum @Rs. 179.37/cum   **Rs.2700.00**

b) Sand for an av. lead of 10 kms

Qty. vide item no. 6(a) = 15.04 cum @50% = 7.52 cum @ Rs.179.37/ cum   <u>Rs.1349.00</u>

Total:-   **Rs.126681.00**

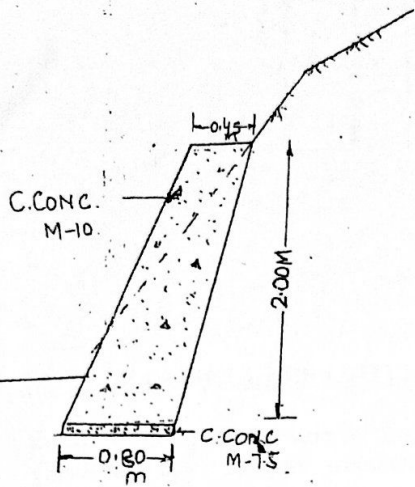Cost per Rmt = Rs. 12668.00/Rmt.
Say Rs. 12600.00/Rmt

Assistant Executive Engineer

Executive Engineer,
PWD (R&B) Division
Kathua.

C.CONC.
M-10

0.45

2.00M

C.CONC
M-1.5

0.80
m

X-SEC OF BREAST WALL
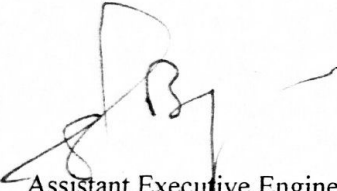
X- Section of Pucca Drain

S.NO.	PARTICULARS OF ITEMS	AMOUNT
1.	Earth Work in excavation by mechanical means. (Hydraulic excavator) in trenches for foundations, drains, pipes and cables etc. (not exceeding 1.5 mtr in width or and the like not exceeding 10 sqm on plan, including dressing of sides and ramming of bottoms lift upto 1.5 m, including getting out excavated earth and disposal of surplus excavated earth as directed, within a lead of 50 metres in all kinds of soil 1 x 10.00 x 0.825 x 0.56 = 4.62 cum @ **Rs.252.05/ cum**	**Rs. 1164.00**
2.	Providing and laying in position cement conc. of specified grade incl curing but excl. the cost of centering and shuttering – All work upto plinth level with 1:4:8 (1 cement : 4 coarse sand :8 graded stone agg. 40 mm nominal size) 1 x 10.00 x 0.825 x 0.11 = 0.91 cum @ **Rs.4419.85/ cum**	**Rs.4022.00**
3.	Providing and laying in position cement concrete of specified grade including curing but excluding the cost of centering and shuttering. All work upto plinth level with:1:3:6 (1 cement :3 coarse sand :6 graded stone agg. 20mm nominal size) 1 x 10.00 x 0.225 x 0.45 = 1.01 cum 1 x 10.00 x 0.15 x 0.45 = 0.68 cum **1.69 cum @ Rs. 4943.40/ cum**	**Rs.8354.00**
4.	Centering and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete. 2 x 2 x 10.00 x 0.45 = **18.00 sqm @ Rs. 262.30/ sqm**	**Rs. 4721.00**

S.NO.	PARTICULARS OF ITEMS	AMOUNT

5. 12 mm thick cement plaster of mix 1:4 (1 cement : 4 fine sand)

    2   x 10.00 x 0.60 = **12.00 sqm** @ Rs 260.05/ sqm   Rs.3121.00

6. Providing and laying damp-proof Course 50 mm thick with cement
concrete 1:2:4 (1 cement:2 coarse sand: 4 graded stone aggregate
20 mm nominal size) and curing complete

    1   x 10.00 x 0.45 = **4.50 sqm**   @ Rs. 372.85/ sqm   Rs. 1678.00

7. Carriage of the materials by M.T. incl. loading, unloading &
stacking complete

a) Stone agg. below 40 mm nominal size for an avg. lead of 5Kms

    Qty. vide item no. 2 = 0.91 cum

    Qty. vide item no.3 = 1.69 cum

    Qty. vide item no. 6 = <u>0.23 cum</u>

           2.83 cum @ 90 % = 2.55cum @ Rs. 179.37/cum   Rs. 457.00

b) Sand for an avg. lead of 5 Kms

    Qty. vide item no. 7 marked (A) = 2.55 cum   @ 50 %   = 1.28 cum

    Qty. vide item no. 5   = 12.00 sqm @ 0.012cum/sqm = <u>0.14 cum</u>

                                   1.42 cum

                         @ Rs. 179.37/ cum   <u>Rs.255.00</u>

                       Total :-   Rs.23822.00

              Cost per Rmt = Rs. **2382.20**

              Say Rs. 2380.00/ Rmt

Assistant Executive Engineer

                                            Executive Engineer,
                                            PWD (R&B) Division
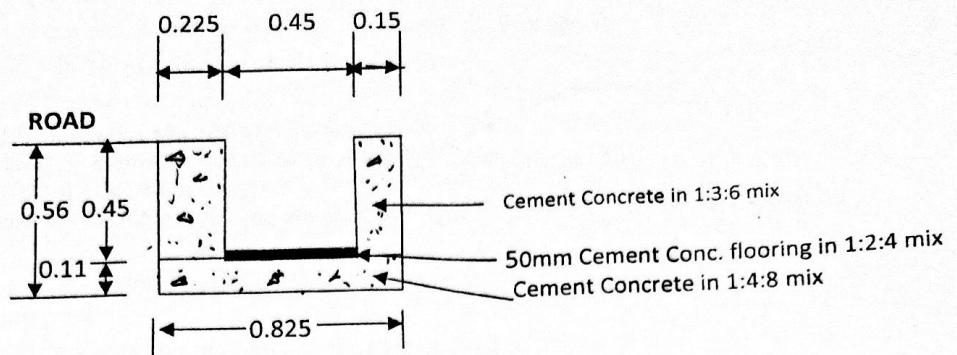   Kathua

BASOLI SIDE →

← LAKHANPUR SIDE

191000 (LENGTH OF BRIDGE)

SECTIONAL ELEVATION
(SCALE 1:300)

PLAN
(SCALE 1:300)

HALF PLAN AT TOP OF DECK LEVEL | HALF PLAN BELOW DECK LEVEL

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS ARE NOT TO BE SCALED ONLY. WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. FOR OTHER NOTES REFER SHEET 2 OF 3.

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS ARE NOT TO BE SCALED ONLY. WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. GRADE OF CONCRETE FOR VARIOUS STRUCTURAL COMPONENTS SHALL BE AS FOLLOWS:-
   - PSC I - GIRDER — M-45
   - ABUTMENT, ABUTMENT CAP — M-35
   - PIER & PIER CAP — M-35
   - DIRT WALL, RETURN WALL — M-35
   - RAILING, CRASH BARRIER — M-35
   - APPROACH SLAB — M-30
   - PEDESTAL & RESTRAINER — M-35
   - WELL CAP & WELL STEINING — M-35
   - WELL CURB — M-35
   - BOTTOM PLUG — M-15
   - LEVELLING COURSE — M-15

Assistant Executive Engineer, PWD (R&B) Sub-Division No. II Kathua

Executive Engineer PWD (R&B) Division Kathua

TITLE: GENERAL ARRANGEMENT DRAWING

CONSULTANT: RHODICON INFRA ENGINEERING PVT. LTD.

191m LONG BRIDGE OVER NORA NALLAH

DETAIL AT `A`
(SCALE 1:75)

Ç EXP. JOINT
38200
Ç BEARING
1200   35800
50 EXP. JOINT
RCC CRASH BARRIER
3500
APPROACH SLAB 300 THK.
PCC 150 THK.
1.5H / 1V
RCC DIRT WALL
RETURN WALL TO BE KEPT MIN. 500MM BELOW BOTTOM OF STONE PITCHING
LONG. & TRANS. SEISMIC RESTRAINER
PSC I – GIRDER
POT-PTFE BEARING
RCC PEDESTAL
RCC ABUTMENT CAP
RCC ABUTMENT WALL
MAX. CANTILEVER 3000
5000 (MIN.)

DETAIL AT `B`
(SCALE 1:75)

38200   38200
BEARING Ç   Ç BEARING
35800   1200 | 1200   35800
Ç EXP. JOINT
50 EXP. JOINT
RCC CRASH BARRIER
LONG. & TRANS. SEISMIC RESTRAINER
PSC I – GIRDER
POT-PTFE BEARING
RCC PEDESTAL
RCC PIER CAP
RCC CIRCULAR PIER

CROSS SECTION OF BRIDGE NEAR ABUTMENT LOCATION
(SCALE 1:75)

Ç OF BRIDGE
12150
FORMATION WIDTH
7500
CARRIAGEWAY
375 | 1500 | 450   FORMATION LVL.   450 | 1500 | 375
FOOTPATH   410.000   FOOTPATH
1100
900
65 THK. BITUMINOUS W.C.
2.5% SLOPE   2.5% SLOPE
RCC RAILING
RCC CRASH BARRIER
DRAINAGE SPOUT
PSC I – GIRDER
LONG. & TRANS. SEISMIC RESTRAINER
1000 | 3000 (TYP.)
Ç OF JACK (TYP.)   Ç BEARING (TYP.)
RCC ABUTMENT CAP
RCC ABUTMENT WALL
RCC RETURN WALL
GROUND LVL.
1000 (TYP)
1000 (TYP)
402.000 TOP OF WELL CAP
PCC 150 THK.
WELL CAP
TOP PLUG
SAND FILLING
WELL STEINING
MSL 391.800
1000   7000
WELL CURB
BOTTOM PLUG
FOUNDING LVL. 381.000 FOR A1 / 383.000 FOR A2

(RIGHT SECTION — PIER)

Ç OF BRIDGE
12150
FORMATION WIDTH
7500
CARRIAGEWAY
375 | 1500 | 450   450 | 1500 | 375
FOOTPATH   FOOTPATH
FORMATION LVL. 410.000
1100
900
240
65 THK. BITUMINOUS W.C.
2.5% SLOPE   2.5% SLOPE
RCC RAILING
RCC CRASH BARRIER
DRAINAGE SPOUT
PSC I – GIRDER
LONG. & TRANS. SEISMIC RESTRAINER
1000   3000 (TYP.)
Ç OF JACK (TYP.)   Ç BEARING (TYP.)
RCC CIRCULAR PIER
GROUND LVL.
393.500 TOP OF WELL CAP
WELL CAP
TOP PLUG
SAND FILLING
WELL STEINING
MSL 384.500
1000   7000
WELL CURB
BOTTOM PLUG
FOUNDING LVL. 372.500

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. FOR OTHER NOTES REFER SHEET 2 OF 3.

Assistant Executive Engineer
PWD (R&B) Sub-Division No. 0
Kathua

Executive Engineer
P.W.D. (R&B) Division
Kathua

SITE PLAN FOR PROPOSED BRIDGE ON NORA NALLAH ON LAKHANPUR -THEIN ROAD
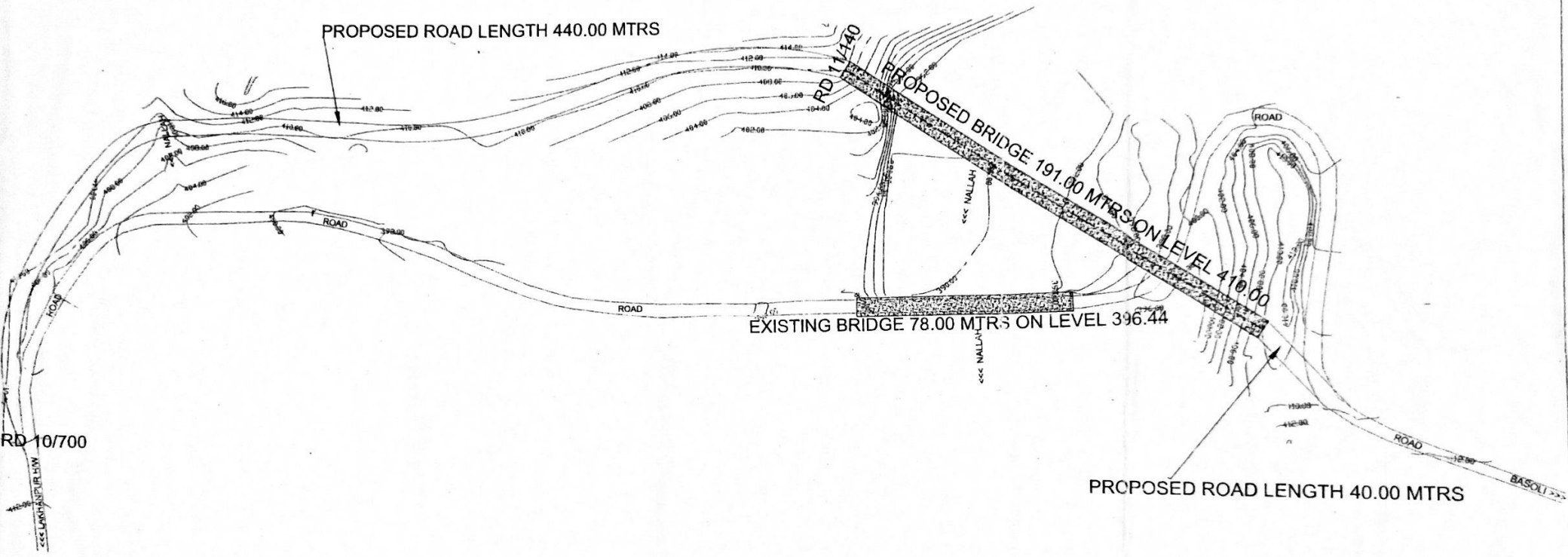
PROPOSED ROAD LENGTH 440.00 MTRS

RD 11/140

PROPOSED BRIDGE 191.00 MTRS ON LEVEL 410.00

ROAD

EXISTING BRIDGE 78.00 MTRS ON LEVEL 396.44

RD 10/700

PROPOSED ROAD LENGTH 40.00 MTRS

BASOLI >>

Executive Engineer
P.W.D. (R&B) Division
Kathua

Assistant
PWD (R&B) Sub Division No.
Kathua
SURVEY AGENCY

AMAR ENGINEERS
PH, 97973-87040