MINISTRY OF ROAD, TRANSPORT & HIGHWAYS
GOVERNMENT OF INDIA

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DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510
(SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING)
IN THE STATE OF SIKKIM

NHIDCL
BUILDING INFRASTRUCTURE - BUILDING THE NATION

DETAILED PROJECT REPORT

VOLUME – IV: DETAILED COST ESTIMATE

PACKAGE –V (From Km 58+840 to Km 75+000)

ESTIMATED COST: Rs.239.45Cr

MAY- 2020

CM engineering SOLUTION

CM ENGINEERING & SOLUTION

House No. –1473A, Maruti Vihar, Gurgaon, Haryana – 122002,Tel – 0124 –4255138
Mobile No – 09811406386/09911052266, Email- cmesconsultancy@gmail.com

NHIDCL SIKKIM

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DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

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INTRODUCTION

General

The cost estimate presented in this Section is based on the detailed proposals given in estimate. 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.

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 and Bridges Works
* Bridge Works
* Pavement Works
* Road appurtenances

Detailed estimate of quantities and costs are presented in "Volume – IV: 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.

Earthwork: Earthwork quantities in cutting and small quantities of filling are calculated by highway design software Mx-Road 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.

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

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.

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

- Cement Treated Sub-base (CT): 200.00 mm thick sub-base layer of crushed stone aggregate has been proposed.

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

- Cement Treated Base (CT): 150.00 mm thick base layer of Cement Treated Base is proposed for 7.0m width.

- Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm in one layer.

- DBM of 50mm thick as surfacing course has been proposed.

- BC of 30mm thick as surfacing course has been proposed.

Junctions Improvement: This item includes quantities of kerbs, railings, median etc. at the location of junctions. Other items of road works have been included under the respective items of works. The cost for junctions includes the cost for at grade junctions, which need improvement along the highway.

Traffic Signs and Markings: Proper traffic signs were selected at required locations along the project corridor and special signs at tailgates were designed. It is reviewed considering the traffic and pedestrian safety and the number of traffic signs shall be minimum and modified if required. Centre line and edge markings required from safety point of view were considered in the quantity estimate.

Drainage and Protection works: Provision under this sub-head has been made for surface, subsurface roadside drains and open Transverse drains on the shoulder. This item covers for unlined, open lined and covered drains.

Project Facilities: provision under this sub head has been made for Truck lay-bye & Bus bays with Bus Shelters based on Manual of Standards & Specifications of two laning, IRC:SP:84-2009.

Miscellaneous Items: Lump sum amounts for cross utility ducts and Planting of trees by the road side (Avenue trees) has been provided and drainage chutes in cement concrete & stone pitching at outfalls/escapes for drainage in high embankment location.

Other Charges: Other charges include Centages for the civil works are taken as follow:

- Contingency = 2.8%
- Construction Supervision Charge = 3.0%
- Maintenance for 5Years = 2.50 %
- Escalation for 1.5 Years = 1.5 x 5.0% =7.5%
- Agency (NHIDCL) Charge = 3.0 %

Unit Rates

The unit rates for arriving at cost of different components of works are based on Sikkim PWD Schedule of Rates 2018 (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.The following considerations have been made with regard to the basic inputs of rate analysis:

- Material
- Labour
- Machineries

Material

The sources of material are as follows:

Bitumen	:	Siliguri, West Bengal
Emulsion	:	Siliguri, West Bengal
Steel	:	Siliguri, West Bengal
Cement	:	Siliguri, West Bengal
Borrow Soil	:	Borrow areas along the project
Aggregates	:	River bed Material /Quarry in Project Corridor
GSB	:	River bed Material in Project Corridor
Course Sand	:	River bed Material in Project Corridor
Fine Sand	:	River bed Material in Project Corridor

One Hot Mix Plant has been proposed to be erected at mid of the project road during construction. An Avg. lead of 15.0 km has been assumed form the HMP. The lead considerations for the different materials are as follows:

Bitumen	:	135.0 km to the Hot Mix Plant
Emulsion	:	135.0 km to the Hot Mix Plant
Steel	:	135.0 km from market to site
Cement	:	135.0 km from market to site
Borrow Soil	:	5 km from the site
Aggregates	:	55 km to the HMP
GSB	:	55 km to the HMP
Coarse Sand	:	55 km to the HMP
Fine Sand	:	55 km to HMP

Labour :*Labour rates for rate analysis have been based on Schedule of Rates (SOR) -2018 of Sikkim PWD*

Machineries: *The rates of machineries have been taken Schedule of Rates (SOR) -2018 of Sikkim PWD*

Project cost estimate is prepared based on SOR-2018, however WPI Financial Year 2018-19 to Financial Year 2019-20 (119.80 % to 121.86%) is included in the project cost to bring the current rate of project cost.

In proposed project cost is also included 12% of GST,

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/Bridges 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 239.45 Cr.** which covers costs for formation work, Slope protection and cross drainage works, construction of bridges, and pavement works. Construction period of 30 months is proposed, considering the quantum of activities to be performed including mobilization period needed and four intervening rainy seasons in between.

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

ABSTRACT OF COST ESTIMATE

Sr.No.	Items of work	Total quantity	Unit	Amount (Rs)	Share
	CONSTRUCTION COST	16.16	Km		
1	Site Clearance			1,468,574.56	0.08%
2	Formation Works	2000142.20	Cum	416,387,074.36	22.95%
3	Protection Works	11125.00	Rm	306,560,612.20	16.90%
4	Cross Drainage Works	59.00	Nos	120,246,120.00	6.63%
5	Pavement Works	16.16	Km	376,901,973.78	20.78%
6	Km Stones & Road Signs		Nos	28,987,474.00	1.60%
7	Road Safety Measures		Rm	18,016,000.00	0.99%
8	Development of Junction		LS	22,113,103.00	1.22%
9	Development of Dumping Yard		LS	42,374,732.97	2.34%
10	Bridge Work	5	Nos	480,957,228.77	26.51%
A	**TOTAL OF (1 to 10)**		**Rs**	**1,814,012,893.64**	100.0%
B	**GST 12% of "A"**		**Rs.**	**217,681,547.24**	
C	**Civil cost Including GST (A+B)**		**Rs.**	**2,031,694,440.88**	
D	**Add Contigency 2.8% on "A"**		**Rs.**	**50,792,361.02**	
E	**Sub Total (C+D)**		**Rs.**	**2,082,486,801.90**	
F	Maintenance for 5 Years (0.0%+0.5%+0.5%+0.5%+1%=2.5% of C)		Rs.	50,792,361.02	
G	Escalation (7.5% of C) for 18 Months		Rs.	152,377,083.07	
H	Construction supervision Charge (3 % of A)		Rs.	54,420,386.81	
I	Agency NHIDCL) Charge (3 % of A)		Rs.	54,420,386.81	
J	**TOTAL PROJECT COST (E+F+G+H+I)**		**Rs.**	**2,394,497,019.61**	
	Say		**Rs.**	**2,394,500,000.00**	
K	**PreConstruction Activity Cost**				
1	Forest Compensatory Afforestration		**Rs.**	**36,280,257.87**	
2	Utility Relocation & Shifting		**Rs.**	**907,006.45**	
3	Environment Impact Assessment		**Rs.**	**907,006.45**	
4	Land Acquisition & Resettlement		**Rs.**	**217,681,547.24**	
	TOTAL PRE CONSTRUCTION COST(1+2+3+4)		**Rs.**	**255,775,818.01**	
	TOTAL COST OF PROJECT (J+K)			**2,650,272,837.62**	
	Say		**Rs.**	**2,650,300,000.00**	
	Project Cost per Km		**Rs.**	**148,174,504.95**	
	Civil cost per km		**Rs.**	**112,253,273.12**	

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

ABSTRACT OF COST ESTIMATE FOR CIVIL WORK

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Sr.No.	Items of work	Total quantity	Unit	Amount
A.	**SITE CLEARANCE**	**TOTAL 'A'**	**=**	**1,468,574.56**
1	Cutting of Trees	709.00	Nos	298,949.00
2	Clearing and Grubbing Road Land	36.16	Ha	1,140,802.40
3	Dismantling of Structures		L.S.	28,823.16
4	Dismantling of Flexible Pavements		L.S.	0.00
B.	**FORMATION WORK**	**TOTAL 'B'**	**=**	**416,387,074.36**
1	Ordinary soil	983838.30	Cum	148,362,818.32
2	Soft rock	899459.20	Cum	195,902,213.76
3	Hard rock	116844.70	Cum	55,127,329.46
4	Construction of Embankment	51337.44	Cum	8,830,039.68
5	Preparation of Sub-Grade	15582.94	Cum	5,157,953.14
6	Compacting of OGL supporting subgrade	37120.00	Cum	3,006,720.00
C.	**PROTECTION WORKS :**	**TOTAL 'C'**	**=**	**306,560,612.20**
1	Vetiver grass sods	54615.00	Sqm	8,798,476.50
2	Seeding and Mulching	54615.00	Sqm	10,376,850.00
3	Vegetation Mat (Steep Slope)	3850.00	Sqm	1,932,700.00
4	Retaining wall for 2.0 m Height	680.00	Rm	10,867,399.60
5	Retaining wall for 3.0 m Height	710.00	Rm	19,484,075.60
6	Retaining wall for 4.0 m Height	680.00	Rm	28,082,272.80
7	Retaining wall for 5.0 m Height	470.00	Rm	24,204,868.40
8	Retaining wall for 6.0 m Height	270.00	Rm	18,092,381.40
9	Retaining wall for 8.0 m Height	300.00	Rm	22,769,073.00
10	Retaining wall for 10.0 m Height	210.00	Rm	19,413,729.30
11	Retaining wall for 12.0 m Height	110.00	Rm	11,949,905.00
12	Retaining wall for 14.0 m Height	110.00	Rm	13,775,290.10
13	Breast Wall 2.00m high	3200.00	Rm	43,593,600.00
14	Breast Wall 3.00m high	725.00	Rm	17,461,625.00
15	Gabion facia RE Wall	200.00	Sqm	1,668,400.00
16	Gabion Wall 2.00 m high	2775.00	Rm	27,428,377.50
17	Gabion Wall 3.00 m high	465.00	Rm	9,208,813.50
18	Toe Wall 2.00 m high	90.00	Rm	1,205,343.90
19	Toe Wall 3.00 m high	130.00	Rm	3,075,230.60
20	Crib Work (F300)	400.00	Sqm	1,306,800.00
21	Crib Work (F500)	400.00	Sqm	2,286,000.00
22	Anchor Work	500.00	Rm	9,193,000.00
23	Rock-bolt Work	300.00	Rm	386,400.00
24	Sub Surface Drains with Perforated Pipe	0.00	Rm	0.00
D.	**DRAINAGE WORKS :**	**TOTAL 'D'**	**=**	**120,246,120.00**
a	Concrete lined side drain	21830.00	Rm	43,161,185
1	**Box Culvert**			
a	Type -1 - 2 x 2	58.00	No	73,983,317
b	Type -2 - 3 x 3	0.00	No	0
c	Type -3 - 4 x 4	1.00	No	3,101,618
d	Type -3 - 6 x 4	0.00	No	0

Sr.No.	Items of work	Total quantity	Unit	Amount
2	**Chute**			
a	***Type- I (1.85m Width)***	0.00	Rm	0
b	***Type- II (2.1m Width)***	0.00	Rm	0
c	***Type- III (2.6m Width)***	0.00	Rm	0
E.	**PAVEMENT WORKS**	**TOTAL 'E'**	**=**	**376,901,973.78**
1	GSB	0.00	Cum	0.00
1	CT Sub-base	27905.42	Cum	93,455,251.58
2	CT Base	21007.37	Cum	69,387,343.11
3	Penetration Coat	139527.10	Sqm	4,325,340.10
4	SAMI	139527.10	Sqm	13,115,547.40
5	Tack Coat	145617.10	Sqm	2,038,639.40
6	Dense Graded Bituminous Macadam	7280.86	Cum	75,771,910.02
7	Bituminous Concrete	4138.83	Cum	47,716,571.07
8	Carriage of materials			71,091,371.10
F.	**KM STONE & ROAD SIGN**	**TOTAL 'F'**	**=**	**28,987,474.00**
1	Traffic Sign	185.00	Nos	1,045,075.00
2	Pavement marking	4,848.00	Sqm	6,147,264.00
3	Direction and Place Identification signs upto 0.9 sqm size board.	4.00	Sqm	66,212.00
4	Boundary stone, km stone,5th km stone, & hectometre stones	824.00	Nos	315,106.00
5	Traffic blinker LED Delineator, stud, reflective payment marker, tree reflector	500.00	Nos	1,696,500.00
6	Road furniture	2,600.00	Nos	2,618,200.00
7	Bus Bay		L.S.	7,031,844.00
8	Roadside Amenities		L.S.	1,140,980.00
9	View Point		L.S.	925,725.00
10	Land Slide Clearance		L.S.	8,000,568.00
G.	**ROAD SAFETY MEASURES**	**TOTAL 'G'**	**=**	**18,016,000.00**
	Steel Crash Barrier	4000.00	Rm	18,016,000.00
H.	**JUNCTION DEVELOPMENT**	**TOTAL 'H'**	**=**	**22,113,103.00**
1	Development Major junction		L.S.	14,862,922.00
2	Development Minor junction		L.S.	7,250,181.00
I.	**DEVELOPMENT OF DUMPING YARD**	**TOTAL 'J'**	**=**	**42,374,732.97**
1	Spreading & Compaction of surplus material	1186755.69	Cum	15,427,823.97
2	Gabion wall	1100.00	Rm	15,832,410.00
3	Plum Toe wall	600.00	Rm	11,114,499.00
J.	**BRIDGE WORK**	**TOTAL 'H'**	**=**	**480,957,228.77**
1	Km 58+888 Span Arrganement 21 x 60 x 21 Ex. Bridge	1	Nos	1,349,380.00
2	Km 63+335 Span Arrganement 1 x 20 + 1 x 48	1	Nos	75,233,933.79
3	Km 66+695 Span Arrganement 1 x 15 + 1 x90 + 1 x 15	1	Nos	139,606,409.13
4	Km 70+090 Span Arrganement 1 x 48	1	Nos	72,201,081.29
5	Km 70+620 Span Arrganement 1 x 70	1	Nos	96,012,152.07
6	Km 74+355 Span Arrganement 1 x20 + 1 48 + 1 x 20	1	Nos	96,554,272.49
		GRAND TOTAL=	**Rs.**	**1,814,012,893.6**
			Say = Rs.	**1,814,020,000.0**

(Rupees one hundred eighty one crore forty lakh twenty thousand) only

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE

COST ESTIMATE FOR SITE CLEARANCE

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Sl/SOR	Description	Unit	N	L	B	H	Quantity	Rate	Amount
1/2.1	**Cutting of Trees, including Cutting of Trunks, Branches and Removal** (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 mtrs and earth filling in the depression/pit.)								
	(A) Lead upto 1000m.								
	(i) Girth above 300mm to 600mm.	Nos		Qnty taken from detail of cutting down trees			415.00	266.00	110,390.00
	(ii) Girth above 600mm to 900mm.	Nos					197.00	404.00	79,588.00
	(iii) Girth above 900mm to 1800mm.	Nos					72.00	893.00	64,296.00
	(iv) Girth above 1800mm.	Nos					25.00	1787.00	44,675.00
2/2.3	**Clearing and Grubbing Road Land.** (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.)								
(ii)	By Mechanical Means								
A	In area of light jungle	Ha		Qnty taken from clearing and grubbing of road land			0.16	25865.00	4,138.4
B	In area of thorny jungle	Ha					36.00	31574.00	1,136,664.0
3/2.4	**Dismantling of Structures** (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)	**Lime /Cement Concrete**								
II	**By Mechanical Means for items No. 202(b) & (c)**								
A	Cement Concrete Grade M-15 & M-20 (slab culvert slab)	Cum	7	6.5	1.3	0.2	11.83	425.00	5,027.75
(iii)	**Dismantling Stone Masonry**								
B	Rubble stone masonry in cement mortar. (Slab Culvert abutment wall)	Cum	7	6.5	1.2	1.5	81.9	188.00	15,397.20
1.4	**Cost of Haulage Excluding Loading and Unloading**								
(i)	Surfaced Road Upto 10 Km lead	T.km					149.968	56.00	8,398.21
								Total	**1,468,575**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

COST ESTIMATE FOR FORMATION CUTTING

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Sl/SOR	Description	Unit	L	B	H	Quantity	Rate	Amount
1/3.32	**Excavation in Hilly Areas in Soil By Mechanical Means** (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 .)		Quantity taken and calculated from abstract of Earth Work			**983838.30**		
	Case-I : Disposal of cut material with all lifts and lead upto 1000 metres.	Cum				983838.3	124.00	121,995,949.20
	(ii) Disposal of surplas earth from roadway and drain for additional haul involving beyond 1km and upto 10 km	Cum	50% of total Quantity of Case -I			491919.2	53.60	26,366,869.12
2/3.33	**Excavation in Hilly Area in Ordinary Rock by Mechanical Means not Requiring Blasting.** (Excavation in hilly area in ordinary rock not requiring ballasting by mechanical means including cutting and trimming of slopes and disposal of cut material.)		Quantity taken and calculated from abstract of Earth Work			**899459.20**		
	Case-I : Disposal of cut material with all lifts and lead upto 1000 metres.	Cum				899459.2	191.00	171,796,707.20
	(ii) Disposal of surplas earth from roadway and drain for additional haul involving beyond 1km and upto 10 km	Cum	50% of total Quantity of Case -I			449729.6	53.60	24,105,506.56
3/3.08	**Excavation in Hard Rock (blasting prohibited)** (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.)		Quantity taken and calculated from abstract of Earth Work			**116844.70**		
	Case-I : Disposal of cut material with all lifts and lead upto 1000 metres.	Cum				116844.70	445.00	51,995,891.50
	(ii) Disposal of surplas earth from roadway and drain for additional haul involving beyond 1km and upto 10 km		50% of total Quantity of Case -I			58422.35	53.60	3,131,437.96
4/3.17	**Construction of Embankment with Material Deposited from Roadway Cutting** (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)	Cum	Quantity taken from Abstract of Earth Work Table			51337.44	172.00	8,830,039.68
5/3.18	**Construction of Subgrade and Earthen Shoulders** (Construction of subgrade 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)	Cum	Quantity taken from Abstract of Earth Work Table			15582.94	331.00	5,157,953.14

Sl/SOR	Description	Unit	L	B	H	Quantity	Rate	Amount
6/3.19	**Compacting original ground supporting subgrade** (Loosening of the ground upto a level of 500 mm below the subgrade level, watered, graded and compacted in layers to meet requirement of table 300-2 for subgrade construction.)	Cum	7424	10.00	0.50	37120.00	81.00	3006720.00
		Sub Total of Earth work						**416,387,074**
7/A1	Construction of M20 grade lined surface drains specified lines, grades, levels and dimensions as per drawing or technical specification section 309 and 1700	Rm	21830.00			21830.00	1977.15	43161184.50
		Sub Total of side drain						**43,161,185**
						Grand Total of Earth work & Side Drain		**459,548,259**

(Rupees forty five crore ninety five lakh forty eight thousand two hundred fifty nine) only

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

DETAIL ESTIMATE FOR SLOPE PROTECTION WORKS

Sl/SOR	Description	Unit	L	B	H	Quantity	Rate	Amount
1/3.22	**Vetiver grass sods** (Furnishing and laying of the live sods of perennial turf forming grass on embankment slope, verges , Cutting Slope or other locations shown on the drawing or as directed by the engineer including preparation of ground, fetching of rods and watering)	Sqm	Location of Bio Protection work			54615.00	Rs. 161.10	8,798,476.50
2/3.23	**Seeding and Mulching** (Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, mulching material, applying bituminous emulsion at the rate of0.23 litres per sqm and laying and fixing jute netting, including watering for 3 months all as per clause 308)	Sqm				54615.00	Rs. 190.00	10,376,850.00
3/7.5	Vegetation Mat (Steep Slope) Supply and Installation of Non woven Coir Erosion Control Blanket for slope surface erosion protection including labours, tools and tackels complete as per the Technical specification mentioned in the tender document.	Sqm	550.0	7.0		3850.00	Rs. 502.00	1,932,700.00
	Summary details of Slope protection work							
1	Retaining wall for 2.0 m Height	Rm	Location of Retaining wall			680.00	15,981.47	10,867,399.60
2	Retaining wall for 3.0 m Height	Rm				710.00	27,442.36	19,484,075.60
3	Retaining wall for 4.0 m Height	Rm				680.00	41,297.46	28,082,272.80
4	Retaining wall for 5.0 m Height	Rm				470.00	51,499.72	24,204,868.40
5	Retaining wall for 6.0 m Height	Rm				270.00	67,008.82	18,092,381.40
6	Retaining wall for 8.0 m Height	Rm				300.00	75,896.91	22,769,073.00
7	Retaining wall for 10.0 m Height	Rm				210.00	92,446.33	19,413,729.30
8	Retaining wall for 12.0 m Height	Rm				110.00	108,635.50	11,949,905.00
9	Retaining wall for 14.0 m Height	Rm				110.00	125,229.91	13,775,290.10
10	Breast Wall 2.00m high	Rm	Location of Breast wall			3200.00	13,623.00	43,593,600.00
11	Breast Wall 3.00m high	Rm				725.00	24,085.00	17,461,625.00
12	Gabion Wall 2.00 m high	Rm	Location of Gabion wall			2775.00	9,884.10	27,428,377.50
13	Gabion Wall 3.00 m high	Rm				465.00	19,803.90	9,208,813.50
14	Toe Wall 2.00 m high	Rm	Location of Toe wall			90.00	13,392.71	1,205,343.90
15	Toe Wall 3.00 m high	Rm				130.00	23,655.62	3,075,230.60
16	Crib Work (F300)	sqm	Location of Sinking & Sliding			400.00	3,267.00	1,306,800.00
17	Crib Work (F500)	sqm				400.00	5,715.00	2,286,000.00
18	Anchor Work	Rm				500.00	18,386.00	9,193,000.00
19	Rock-bolt Work	Rm				300.00	1,288.00	386,400.00
20	Gabion Reinforced wall with Geogrid and Chimney drain	sqm				200.00	8,342.00	1,668,400.00
				Total cost for slope protection works =				**306,560,612.20**

Slope protect

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

DETAIL ESTIMATE FOR CROSS DRAINAGE WORKS

Sr.No	Description of Item	Unit	Rate per Unit	Qntty.	Cost	Total
	Box Culvert					
1	Type -1 - 2 x 2	No	Rs. 1,275,574.43	58	Rs. 73,983,316.94	**Rs. 77,084,935.21**
2	Type -2 - 3 x 3	No	Rs. 2,018,767.73	0	Rs. -	
3	Type -3 - 4 x 4	No	Rs. 3,101,618.27	1	Rs. 3,101,618.27	
4	Type -4 - 6 x 4	No	Rs. 5,072,246.50	0	Rs. -	
Br.	Type -4 - 8 x 6	No	Rs. 8,476,324.83	0	Rs. -	**Rs. -**
1	Chute Type-I	Rm	Rs. 8,075.76	0	Rs. -	**Rs. -**
2	Chute Type-II	Rm	Rs. 10,401.89	0	Rs. -	
3	Chute Type-III	Rm	Rs. 11,770.38	0	Rs. -	
					Total cost for cross drainage works =	**Rs. 77,084,935.21**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

DETAIL ESTIMATE FOR PAVEMENT WORKS

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Sl/SOR	Description	Unit	L	B	H	No	Qnty	Rate	Amount
1/4.6 (i)	**Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Sub base** (Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, 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.)								
	Carriageway	Cum	14730.00	8.80	0.200	1.00	25924.80		
	From Km 59+100 to 59+970	Cum	870.00	0.90	0.200	2.00	313.20		
	Extra widening of curve	Cum	8337.10		0.200	1.00	1667.42		
	Total	Cum					**27905.42**	**3349.00**	**93,455,251.58**
2/4.6 (ii)	**Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Base** (Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, 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 base.)								
	Carriageway	Cum	14730.00	8.80	0.150	1.00	19443.60		
	From Km 59+100 to 59+970	Cum	870.00	0.90	0.200	2.00	313.20		
	Extra widening of curve	Cum	8337.10		0.150	1.00	1250.57		
	Total	Cum					**21007.37**	**3303.00**	**69,387,343.11**
3/4.11	**Penetration Coat Over Top Layer of Crushed Cement Concrete Base** (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)								
	Carriageway	Sqm	14730.00	8.800		1.00	129624.00		
	From Km 59+100 to 59+970	Sqm	870.00	0.900		2.00	1566.00		
	Extra widening of curve	Sqm	8337.10			1.00	8337.10		
	Total	**Sqm**					**139527.1**	**31.00**	**4,325,340.10**

Sl/SOR	Description	Unit	L	B	H	No	Qnty	Rate	Amount
4/5.21(ii)	**Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm** (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.)								
	Carriageway	Sqm	14730.00	8.800		1.00	129624.00		
	From Km 59+100 to 59+970	Sqm	870.00	0.90		2.00	1566.00		
	Extra widening of curve	Sqm	8337.10			1.00	8337.10		
	Total	**Sqm**					**139527.10**	**94.00**	**13,115,547.40**
5/5.2	**Tack Coat** .(i) Providing and applying tack coat with Bitumen emulsion (RS-1) using emulsion distributor at the rate of 0.25 to 0.30 kg per sqm on the prepared Normal Bituminous Surface with primer and cleaned with Hydraulic broom as per Technical Specification Clause 503. (Normal Bituminous Surface)								
	Carriage way portion	Sqm	15600.00	8.800		1.00	137280.00		
	Eextra widening of curve	Sqm	8337.10			1.00	8337.10		
	Total	**Sqm**					**145617.1**	**14.00**	**2,038,639.40**
6/5.6	**Dense Graded Bituminous Macadam** (Providing and laying dense 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% by weight of total mix 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. 507 complete in all respects.)								
	Case - II for Grading II (19 mm nominal size)	Cum	15600.00	8.80	0.05	1.00	6864.00		
	Eextra widening of curve	Cum	8337.10		0.05	1.00	416.86		
	Total	Cum					7280.86	**10407.00**	**75,771,910.02**

Sl/SOR	Description	Unit	L	B	H	No	Qnty	Rate	Amount
7/5.8	**Bituminous Concrete** (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 % 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) Case-I Using Bitumen 60/70 grade (i)for Grading-I (13 mm nominal size)								
	Carriageway	Cum	14730.00	8.800	0.03	1.00	3888.72		
	Extra widening of curve	Cum	8337.10		0.03	1.00	250.11		
	Total	**Cum**					**4138.83**	**11529.00**	**47,716,571.07**
8/1.1	**Loading and unloading of Lime, Aggregates, Stone boulder,Brick Aggregates etc. by manual means**								
	i) Loading of aggregates	Cum	Qnty taken from Pavment Qnty Calculation				54174.4	105.0	**5,688,312.00**
	ii) Loading of sand	Cum					28607.4	105.0	**3,003,777.00**
9/1.9	**Loading and unloading of Bitumen drums by manual means including a lead upto 30m**								
	i) Bitumen drums by manual means including a lead upto 30m	ton	Qnty taken from Pavment Qnty Calculation				1404.00	105.00	**147,420.00**
10/1.3	**Loading and unloading of Cement by manual means including a lead upto 30m**								
	i)Cement by manual means including a lead upto 30m	ton	Qnty taken from Pavment Qnty Calculation				3913.00	215.00	**841,295.00**

Sl/SOR	Description	Unit	L	B	H	No	Qnty	Rate	Amount
11/1.4	**Haulage excluding Loading and Unloading**								
	Haulage of materials by tipper excluding cost of loading, unloading and stacking			**LEAD Km**			**Qnty Tonne**		
	For BC & SAMI								
	Case-I : Surfaced road								
	a) Sand			55.00			5284.00	6.70	**1,947,154.00**
	b) Aggregates			55.00			30105.00	6.70	**11,093,692.50**
	c) Cement			135.00			0.00	6.70	**0.00**
	d) Bitumen			135.00			1404.00	6.70	**1,269,918.00**
	Case-II : Unsurfaced Gravelled Road								
	a) Sand			2.00			5284.00	8.40	**88,771.20**
	b) Aggregates			2.00			30105.00	8.40	**505,764.00**
	c) Cement			0.00			0.00	8.40	**0.00**
	d) Bitumen			0.00			1404.00	8.40	**0.00**
	For CT Sub base & CT base								
	Case-I : Surfaced road								
	a) Sand			55.00			47354.00	6.70	**17,449,949.00**
	b) Aggregates			55.00			64159.00	6.70	**23,642,591.50**
	c) Cement			135.00			3913.00	6.70	**3,539,308.50**
	d) Bitumen			135.00			0.0	6.70	**0.00**
	Case-II : Unsurfaced Gravelled Road								
	a) Sand			2.00			47354.00	8.40	**795,547.20**
	b) Aggregates			2.00			64159.00	8.40	**1,077,871.20**
	c) Cement			0.00			3913.00	8.40	**0.00**
	d) Bitumen			0.00			0.0	8.40	**0.00**
									376,901,973.78
								Say	**376,901,974.00**

Notes

Total length of Road	=	16160.00	m
Total length of Bridge	=	560	m

Details of Extra Widening of Curve							
Curve No	Chainage	Radius	Length of circular curve	Length of transition curve	Extra Widening	Circular curve portion area in sqm	Transition curve portion area in sqm
1.0	58929.711	-60	47.55	0.000	1.20	57.060	0.000
2.0	59013.814	125	62.45	0.000	0.60	37.470	0.000
3.0	59090.510	-200	32.93	0.000	0.60	19.758	0.000
4.0	59131.940	75	25.49	0.000	0.90	22.941	0.000
5.0	59204.802	-65	60.39	0.000	0.90	54.351	0.000
6.0	59388.936	-65	51.59	15.000	0.90	46.431	13.500
7.0	59533.890	-150	18.68	15.000	0.60	11.208	9.000
8.0	59628.995	-125	4.02	15.000	0.60	2.412	9.000
9.0	59693.080	150	54.89	15.000	0.60	32.934	9.000
10.0	59760.203	75	17.26	15.000	0.90	15.534	13.500
11.0	59842.862	150	31.05	15.000	0.60	18.630	9.000
12.0	60002.817	45	51.51	20.000	1.20	61.812	24.000
13.0	60135.034	-60	7.76	15.000	1.20	9.312	18.000
14.0	60178.184	100	7.29	15.000	0.90	6.561	13.500
15.0	60249.605	250	11.01	15.000	0.60	6.606	9.000
16.0	60317.813	45	11.58	20.000	1.20	13.896	24.000
17.0	60386.520	-30	16.36	30.000	1.50	24.540	45.000
18.0	60449.479	60	9.63	15.000	1.20	11.556	18.000
19.0	60525.230	75	26.62	15.000	0.90	23.958	13.500
20.0	60601.896	75	32.99	15.000	0.90	29.691	13.500
21.0	60692.620	-45	31.91	20.000	1.20	38.292	24.000
22.0	60764.409	55	12.31	20.000	1.20	14.772	24.000
23.0	60825.636	-35	12.06	25.000	1.50	18.090	37.500
24.0	60883.594	60	17.45	15.000	1.20	20.940	18.000
25.0	60933.412	-150	13.09	15.000	0.60	7.854	9.000
26.0	60980.966	45	9.21	20.000	1.20	11.052	24.000
27.0	61024.335	-90	1.44	15.000	0.90	1.296	13.500
28.0	61056.484	75	1.67	15.000	0.90	1.503	13.500
29.0	61091.447	-60	0.87	15.000	1.20	1.044	18.000
30.0	61126.770	55	4.94	15.000	1.20	5.928	18.000
31.0	61170.244	-60	10.12	15.000	1.20	12.144	18.000
32.0	61214.447	-100	10.11	15.000	0.90	9.099	13.500
33.0	61254.698	60	8.17	15.000	1.20	9.804	18.000
34.0	61292.126	-90	2.49	15.000	0.90	2.241	13.500
35.0	61330.836	60	10.61	15.000	1.20	12.732	18.000
36.0	61383.906	-45	12.63	20.000	1.20	15.156	24.000
37.0	61433.027	60	4.86	15.000	1.20	5.832	18.000
38.0	61480.595	60	20.35	15.000	1.20	24.420	18.000
39.0	61551.627	-45	29.72	20.000	1.20	35.664	24.000
40.0	61619.950	-65	1.67	15.000	0.90	1.503	13.500
41.0	61674.273	45	21.77	20.000	1.20	26.124	24.000

Curve No	Chainage	Radius	Length of circular curve	Length of transition curve	Extra Widening	Circular curve portion area in sqm	Transition curve portion area in sqm
42.0	61742.624	-45	9.64	20.000	1.20	11.568	24.000
43.0	61808.352	30	7.20	30.000	1.50	10.800	45.000
44.0	61879.495	-60	30.52	15.000	1.20	36.624	18.000
45.0	61976.898	-150	4.58	15.000	0.60	2.748	9.000
46.0	62024.666	60	4.03	15.000	1.20	4.836	18.000
47.0	62076.441	75	31.39	15.000	0.90	28.251	13.500
48.0	62154.285	-30	22.24	30.000	1.50	33.360	45.000
49.0	62231.532	-65	10.99	15.000	0.90	9.891	13.500
50.0	62290.956	65	2.91	15.000	0.90	2.619	13.500
51.0	62348.911	100	3.74	15.000	0.90	3.366	13.500
52.0	62418.322	60	8.13	15.000	1.20	9.756	18.000
53.0	62481.042	-45	22.23	20.000	1.20	26.676	24.000
54.0	62573.205	75	16.79	15.000	0.90	15.111	13.500
55.0	62659.986	-65	35.98	15.000	0.90	32.382	13.500
56.0	62745.324	60	33.79	15.000	1.20	40.548	18.000
57.0	62828.134	-60	15.00	15.000	1.20	18.000	18.000
58.0	62886.216	60	13.92	15.000	1.20	16.704	18.000
59.0	62936.592	60	11.94	15.000	1.20	14.328	18.000
60.0	62981.888	-90	1.75	15.000	0.90	1.575	13.500
61.0	63036.760	-150	15.91	15.000	0.60	9.546	9.000
62.0	63103.157	100	32.67	15.000	0.90	29.403	13.500
63.0	63175.756	-150	24.49	15.000	0.60	14.694	9.000
64.0	63271.991	30	17.42	30.000	1.50	26.130	45.000
65.0	63408.470	30	23.89	30.000	1.50	35.835	45.000
66.0	63494.360	-65	17.35	15.000	0.90	15.615	13.500
67.0	63568.062	-100	16.34	15.000	0.90	14.706	13.500
68.0	63653.380	-150	7.78	15.000	0.60	4.668	9.000
69.0	63808.255	-60	46.86	15.000	1.20	56.232	18.000
70.0	63915.962	60	48.48	15.000	1.20	58.176	18.000
71.0	64239.167	-60	47.16	15.000	1.20	56.592	18.000
72.0	64345.556	65	12.48	15.000	0.90	11.232	13.500
73.0	64453.066	-60	85.15	15.000	1.20	102.180	18.000
74.0	64557.486	45	40.11	20.000	1.20	48.132	24.000
75.0	64683.035	-65	6.92	15.000	0.90	6.228	13.500
76.0	64745.357	125	43.16	15.000	0.60	25.896	9.000
77.0	64858.095	-70	50.46	15.000	0.90	45.414	13.500
78.0	64957.798	125	24.14	15.000	0.60	14.484	9.000
79.0	65050.139	125	21.68	15.000	0.60	13.008	9.000
80.0	65127.143	75	7.41	15.000	0.90	6.669	13.500
81.0	65277.933	-45	19.79	20.000	1.20	23.748	24.000
82.0	65341.166	60	18.23	15.000	1.20	21.876	18.000
83.0	65406.740	45	20.46	20.000	1.20	24.552	24.000
84.0	65462.903	-60	19.12	15.000	1.20	22.944	18.000
85.0	65526.927	60	34.46	15.000	1.20	41.352	18.000
86.0	65659.575	-35	55.91	30.000	1.50	83.865	45.000

Curve No	Chainage	Radius	Length of circular curve	Length of transition curve	Extra Widening	Circular curve portion area in sqm	Transition curve portion area in sqm
87.0	65864.474	65	21.25	15.000	0.90	19.125	13.500
88.0	65980.025	30	27.15	30.000	1.50	40.725	45.000
89.0	66061.240	-60	20.36	15.000	1.20	24.432	18.000
90.0	66117.577	-75	2.37	15.000	0.90	2.133	13.500
91.0	66240.983	150	89.99	15.000	0.60	53.994	9.000
92.0	66479.713	-60	139.33	15.000	1.20	167.196	18.000
93.0	66526.318	150	8.89	15.000	0.60	5.334	9.000
94.0	66601.083	45	36.86	20.000	1.20	44.232	24.000
95.0	66763.712	45	20.79	20.000	1.20	24.948	24.000
96.0	66843.217	65	2.81	15.000	0.90	2.529	13.500
97.0	66903.837	-45	24.16	20.000	1.20	28.992	24.000
98.0	66974.492	125	24.44	15.000	0.60	14.664	9.000
99.0	67099.764	-60	54.52	15.000	1.20	65.424	18.000
100.0	67235.854	125	58.60	15.000	0.60	35.160	9.000
101.0	67334.979	125	57.83	15.000	0.60	34.698	9.000
102.0	67432.132	-75	56.28	15.000	0.90	50.652	13.500
103.0	67534.703	60	43.28	15.000	1.20	51.936	18.000
104.0	67598.869	-65	4.61	15.000	0.90	4.149	13.500
105.0	67679.272	-45	29.60	20.000	1.20	35.520	24.000
106.0	67760.399	45	17.10	20.000	1.20	20.520	24.000
107.0	67808.323	-100	4.42	15.000	0.90	3.978	13.500
108.0	67851.635	45	9.72	20.000	1.20	11.664	24.000
109.0	67893.379	-100	2.26	15.000	0.90	2.034	13.500
110.0	67932.014	45	7.50	15.000	1.20	9.000	18.000
111.0	67992.553	-60	41.89	15.000	1.20	50.268	18.000
112.0	68080.377	125	57.72	15.000	0.60	34.632	9.000
113.0	68165.575	-45	26.34	20.000	1.20	31.608	24.000
114.0	68242.493	60	38.57	15.000	1.20	46.284	18.000
115.0	68323.962	-60	53.13	15.000	1.20	63.756	18.000
116.0	68413.071	-60	11.59	15.000	1.20	13.908	18.000
117.0	68473.904	60	25.89	15.000	1.20	31.068	18.000
118.0	68556.426	45	9.98	20.000	1.20	11.976	24.000
119.0	68635.856	35	13.27	30.000	1.50	19.905	45.000
120.0	68720.234	-30	17.64	30.000	1.50	26.460	45.000
121.0	68806.259	150	42.96	15.000	0.60	25.776	9.000
122.0	68913.125	-60	49.13	15.000	1.20	58.956	18.000
123.0	68993.002	125	35.06	15.000	0.60	21.036	9.000
124.0	69180.779	125	87.51	15.000	0.60	52.506	9.000
125.0	69323.958	-65	34.48	15.000	0.90	31.032	13.500
126.0	69401.022	150	52.10	15.000	0.60	31.260	9.000
127.0	69482.019	-65	23.93	15.000	0.90	21.537	13.500
128.0	69735.104	-60	96.01	15.000	1.20	115.212	18.000
129.0	69845.932	60	33.08	15.000	1.20	39.696	18.000
130.0	69932.878	-60	23.06	15.000	1.20	27.672	18.000
131.0	70021.015	30	23.57	30.000	1.50	35.355	45.000

Curve No	Chainage	Radius	Length of circular curve	Length of transition curve	Extra Widening	Circular curve portion area in sqm	Transition curve portion area in sqm
132.0	70148.183	45	31.31	20.000	1.20	37.572	24.000
133.0	70260.155	60	11.59	15.000	1.20	13.908	18.000
134.0	70321.467	-65	32.60	15.000	0.90	29.340	13.500
135.0	70389.996	75	4.70	15.000	0.90	4.230	13.500
136.0	70457.919	-30	6.96	30.000	1.50	10.440	45.000
137.0	70544.591	30	6.31	30.000	1.50	9.465	45.000
138.0	70680.026	30	19.00	30.000	1.50	28.500	45.000
139.0	70819.409	-45	25.86	20.000	1.20	31.032	24.000
140.0	70892.941	45	12.73	20.000	1.20	15.276	24.000
141.0	70952.049	-60	6.97	15.000	1.20	8.364	18.000
142.0	71002.365	60	3.82	15.000	1.20	4.584	18.000
143.0	71058.004	-30	8.14	30.000	1.50	12.210	45.000
144.0	71127.508	30	5.55	30.000	1.50	8.325	45.000
145.0	71199.855	-60	19.93	15.000	1.20	23.916	18.000
146.0	71269.761	-45	31.02	20.000	1.20	37.224	24.000
147.0	71326.814	-90	6.50	15.000	0.90	5.850	13.500
148.0	71369.754	75	5.37	15.000	0.90	4.833	13.500
149.0	71414.386	-45	4.13	20.000	1.20	4.956	24.000
150.0	71462.849	45	3.33	20.000	1.20	3.996	24.000
151.0	71505.372	-60	7.07	15.000	1.20	8.484	18.000
152.0	71560.589	-60	25.66	15.000	1.20	30.792	18.000
153.0	71641.359	30	9.40	30.000	1.50	14.100	45.000
154.0	71736.511	-45	3.57	20.000	1.20	4.284	24.000
155.0	71776.228	90	1.38	15.000	0.90	1.242	13.500
156.0	71845.150	60	5.82	15.000	1.20	6.984	18.000
157.0	71883.682	-75	2.73	15.000	0.90	2.457	13.500
158.0	71922.929	60	7.75	15.000	1.20	9.300	18.000
159.0	71962.727	-75	1.69	15.000	0.90	1.521	13.500
160.0	72005.083	60	13.20	15.000	1.20	15.840	18.000
161.0	72062.663	-60	12.11	15.000	1.20	14.532	18.000
162.0	72248.668	75	63.22	15.000	0.90	56.898	13.500
163.0	72427.687	-30	50.38	30.000	1.50	75.570	45.000
164.0	72530.652	75	45.16	15.000	0.90	40.644	13.500
165.0	72689.539	75	1.87	15.000	0.90	1.683	13.500
166.0	72750.645	-100	46.37	15.000	0.90	41.733	13.500
167.0	72826.522	45	20.27	20.000	1.20	24.324	24.000
168.0	72905.453	-60	49.49	15.000	1.20	59.388	18.000
169.0	72981.435	35	1.89	30.000	1.50	2.835	45.000
170.0	73060.418	45	6.86	20.000	1.20	8.232	24.000
171.0	73117.289	-45	19.87	20.000	1.20	23.844	24.000
172.0	73175.934	45	13.79	20.000	1.20	16.548	24.000
173.0	73269.784	45	16.08	20.000	1.20	19.296	24.000
174.0	73334.180	-60	21.37	15.000	1.20	25.644	18.000
175.0	73417.520	-35	11.54	25.000	1.50	17.310	37.500
176.0	73487.302	30	12.92	30.000	1.50	19.380	45.000

Curve No	Chainage	Radius	Length of circular curve	Length of transition curve	Extra Widening	Circular curve portion area in sqm	Transition curve portion area in sqm
177.0	73556.370	-35	6.46	25.000	1.50	9.690	37.500
178.0	73662.855	45	14.92	20.000	1.20	17.904	24.000
179.0	73741.880	-60	58.41	15.000	1.20	70.092	18.000
180.0	73820.638	60	23.30	15.000	1.20	27.960	18.000
181.0	73962.011	-100	22.03	15.000	0.90	19.827	13.500
182.0	74059.192	150	40.15	15.000	0.60	24.090	9.000
183.0	74134.147	-125	6.76	15.000	0.60	4.056	9.000
184.0	74293.758	30	12.79	30.000	1.50	19.185	45.000
185.0	74429.900	30	25.60	30.000	1.50	38.400	45.000
186.0	74531.175	-75	37.66	15.000	0.90	33.894	13.500
187.0	74637.132	200	21.95	15.000	0.60	13.170	9.000
188.0	74829.819	100	36.36	15.000	0.90	32.724	13.500
189.0	74924.293	-75	11.72	15.000	0.90	10.548	13.500
190.0	74997.159	45	4.80	20.000	1.20	5.760	24.000
				Total		**4621.599**	**3715.500**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

QUANTITY CALCULATION FOR PAVEMENT MATERIALS UNDER CARRIAGE ITEM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Ref Item no	Description	Requirement for	Cement	Bitumen	Aggregate	Crushed Sand	Total requirement from estimate	Individual requirement for whole length of road			
								Cement	Bitumen	Aggregate	Sand
			ton	ton	m^3	m^3		ton	ton	m^3	m^3
1	2	3	4	5	6	7	8	9	10	11	12
1/4.1	GSB	225 m^3			201.00	86.400	0.00 m^3	0		0.00	0.00
2/4.6	CT Sub Base	300 m^3	24.00		288.00	96.00	27905.42 m^3	2232.4336		26789.20	8929.73
3/4.6	CT Base	300 m^3	24.00		144.00	240.00	21007.37 m^3	1680.5896		10083.54	16805.90
			Total requirement for the whole length of the road =					**3913.02**	**0.00**	**36872.74**	**25735.63**
							Ton/Unit quantity	1	1	1.74	1.84
							Total weight	**3913.00**	**0.00**	**64159.00**	**47354.00**
								ton	**ton**	**ton**	**ton**
4/4.11	Penetration Coat	7500 m^2		0.250	97.50		139527.10 m^2		4.65	1813.85	0.00
5/5.21	SAMI	10500.00 m^2		11.55	105.00		139527.10 m^2		153.48	1395.27	0.00
6/5.2	Tack coat	3500 m^2	1.050				145617.10 m^2		43.69		
7/5.6	DBM	195.00 m^3		19.13	281.50	5.750	7280.86 m^3		714.27	10510.57	214.69
8/5.8	Bituminous Concrete	191.00 m^3		22.50	165.300	122.620	4138.83 m^3		487.56	3581.93	2657.09
							Total requirement for the whole length of the road =		**1403.65**	**17301.62**	**2871.78**
							Ton/Unit quantity		1	1.74	1.84
							Total weight		**1404.00**	**30105.00**	**5284.00**
									ton	**ton**	**ton**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

DETAIL ESTIMATE FOR KM STONE & ROAD SIGN

SrNo	SOR No.	Description	Unit	No	L	B	H	Quantity	Rate (Rs)	Amount (Rs)
1	**8.4**	Providing and fixing of retro- reflectorised cautionary, mandatory and informatory sign as per IRC :67 made of encapsulated lens type reflective sheeting vide clause 801.3, fixed over aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing								
	(ii)	60 cm equilateral triangle	each					65	4529.00	294385.00
	(iii)	60 cm circular	each					90	6301.00	567090.00
	(v)	60 cm x 45 cm rectangular	each					30	6120.00	183600.00
2	**8.5**	Direction and Place Identification signs upto 0.9 sqm size board. (Providing and erecting direction and place identification retro-reflectorised sign asper IRC:67 made of encapsulated lens type reflective 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)	Sqm					4	16553.00	66212.00
4	**8.13**	Road Marking with Hot Applied Thermoplastic Compound with Reflectorising Glass Beads on Bituminous Surface (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.)	Sqm					4848.00	1268.00	6147264.00
5	**8.14**	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and printing etc)								
	(i)	5th kilometre stone (precast)	each					3	4564.00	13692.00
	(ii)	Ordinary Kilometer stone (Precast)	each					13	2762.00	35906.00
	(iii)	Hectometer stone (Precast)	each					65	760.00	49400.00

SrNo	SOR No.	Description	Unit	No	L	B	H	Quantity	Rate (Rs)	Amount (Rs)
6	**8.15**	**Road Delineators** (Supplying and installation of delineators (road way indicators, hazard markers, object markers), 80-100 cm high above ground level, painted black and white in 15 cm wide stripes, fitted with 80 x 100 mm rectangular or 75 mm dia circular reflectorised panels at the top, buried or pressed into the ground and confirming toIRC-79 and the drawings.)	each					500	3393.00	1696500.00
7	**8.16**	**Boundary pillar** (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)	each					324	667.00	216108.00
8	**8.35**	**Street Furniture** (Road Markers/Road Stud with Lense Reflector (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)	each					2600	1007.00	2618200.00
9	10.12	Land Slide Clearance in soil (Clearance of landslides in soil and ordinary rock by a bull-dozer D 80 A-12, 180 HP and disposal of the same on the valley side)	Cum					200014.2	40.00	8000568.00
10	M	**Bus Bay**								
		Earth workExcavation	Cum	2	198.00	5.20	5.00	10296.00	124.00	1276704.00
		Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Sub base	Cum	2	198.00	5.00	0.20	396.00	3349.00	1326204.00
		Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Base	Cum	2	198.00	5.00	0.30	594.00	3303.00	1961982.00
		Penetration Coat Over Top Layer of Crushed Cement Concrete Base	Sqm	2	198.00	5.00		1980.00	31.00	61380.00
		Bituminous Concrete	Cum	2	198.00	5.00	0.10	198.00	11529.00	2282742.00
		Raised footpath of 2.0m with M15 grade concrete	Cum	2	15.00	2.00	0.30	18.00	6824.00	122832.00

SrNo	SOR No.	Description	Unit	No	L	B	H	Quantity	Rate (Rs)	Amount (Rs)
11	M	**View Point**								
		Earth workExcavation	Cum	1	25.00	7.20	10.00	1800.00	124.00	223200.00
		Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Sub base	Cum	1	25.00	7.00	0.20	35.00	3349.00	117215.00
		Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Base	Cum	1	25.00	7.00	0.30	52.50	3303.00	173407.50
		Penetration Coat Over Top Layer of Crushed Cement Concrete Base	Sqm	1	25.00	7.00		175.00	31.00	5425.00
		Bituminous Concrete	Cum	1	25.00	7.00	0.10	17.50	11529.00	201757.50
		Raised footpath of 2.0m with M15 grade concrete	Cum	1	50.00	2.00	0.30	30.00	6824.00	204720.00
12	M	**Roadside Amenities** Construction roadside Amenities including excavtion of foundation, laying of M15 PCC ,brick masonry (1:3) ,plastering of wall 12mm thk (1:3) ,stone Masonry (1:4) ,Centering and shuttering including strutting,propping etd. And removal of form, fifting of watersupply ,door ,window& electrical fitting complete as per Drawing & CPWD Specification								
		PUBLIC TOILET	No.	2				2.00	184,799	369598.00
		BUS SHED	No.	2				2.00	70,468	140936.00
		BAZAR SHED	No.	2				2.00	315,223	630446.00
								TOTAL		**28987474.0**

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

DETAIL ESTIMATE FOR ROAD SAFETY MEASURES

Item No.	Ref to SOR No.	Description	Unit	Nos	Quantity	Rate (Rs)	Amount (Rs)
1	**8.23-A**	Type - A, "W" : Metal Beam Crash Barrier (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)	metre	1	4000	4504.00	18016000.0
					TOTAL		**18016000**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Cost Estimate for Maintenance of Existing Bridge Over River Rangit

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Sl. No	Sor. No	Description of item	Unit	No.	Length	Width	Height	Quantity	Rate (Rs. P)	Amount (Rs. P)
1	16.2	**Repair of RCC Railing** (Carrying out repair of RCC M30 railing to bring it to the original shape.)	Rm	2	112.0			224.0	417.0	93,408.00
2	16.8	Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per Technical specification	Sqm	1	100.0			100.0	818.0	81,800.00
3	16.15	**Replacement of Expansion Joints complete as per drawings**	Rm	4	12.0			48.0	15,444.0	741,312.00
4	16.1	**Applying pre-packed cement based polymer mortar** of strength 45 Mpa at 28 days for replacement of spalled concrete	Sqm	1	50.0			50.0	526.0	26,300.00
5	14.5	**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.)	Sqm	1	112.0	7.5		840.0	484.0	406,560.00
									Total	**1,349,380.00**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

DETAIL ESTIMATE FOR MAJOR JUNCTION

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Sl/SOR	Description	Unit	L	B	H	No	Qnty	Rate	Amount
1/3.32	Excavation in Hilly Areas in Soil By Mechanical Means (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 .) Case-I : Disposal of cut material with all lifts and lead upto 1000 metres.	Cum	500.00	10.00	1.00	1.00	5000.00	124.00	620,000.00
2/3.19	**Compacting original ground supporting subgrade** (Loosening of the ground upto a level of 500 mm below the subgrade level, watered, graded and compacted in layers to meet requirement of table 300-2 for subgrade construction.)	Cum	500.00	10.00	0.500	1.00	2500.00	81.00	202,500.00
3/3.17	**Construction of Embankment with Material Deposited from Roadway Cutting** (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)	Cum	500.00	10.00	0.500	1.00	2500.00	172.00	430,000.00
4/3.18	**Construction of Subgrade and Earthen Shoulders** (Construction of subgrade 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)	Cum	500.00	10.00	0.500	1.00	2500.00	331.00	827,500.00
5/4.6 (i)	**Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Sub base** (Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, 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.)	Cum	500.00	10.00	0.150	1.00	750.00	3349.00	2,511,750.00
6/4.6(ii)	**Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Base** (Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, 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 base.)	Cum	500.00	10.00	0.250	1.00	1250.00	3303.00	4,128,750.00

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Sl/SOR	Description	Unit	L	B	H	No	Qnty	Rate	Amount
7/4.11	**Penetration Coat Over Top Layer of Crushed Cement Concrete Base** (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)	Sqm	500.00	10.000		1.00	5000.00	31.00	155,000.00
8/5.21(iii)	**Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm** (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.)	Sqm	500.00	10.000		1.00	5000.00	94.00	470,000.00
9/5.8	**Bituminous Concrete** (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 % 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) Case-I Using Bitumen 60/70 grade (i)for Grading-I (13 mm nominal size)	Cum	500.00	10.000	0.05	1.00	250.00	11529.00	2,882,250.00
10/1.1	**Loading and unloading of Lime, Aggregates, Stone boulder,Brick Aggregates etc. by manual means**		Qnty taken from Pavment Qnty Calculation						
	i) Loading of aggregates	Cum					1651.4	105.0	173,397.00
	ii) Loading of sand	Cum					1400.5	105.0	147,052.50
11/1.9	**Loading and unloading of Bitumen drums by manual means including a lead upto 30m**								
	i)Unloading of Bitumen drums by manual means including a lead upto 30m	ton	Qnty taken from Pavment Qnty Calculation				35.00	105.00	3,675.00
12/1.3	**Loading and unloading of Cement by manual means including a lead upto 30m**								
	i)Cement by manual means including a lead upto 30m	ton	Qnty taken from Pavment Qnty Calculation				160.00	215.00	34,400.00

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Sl/SOR	Description	Unit	L	B	H	No	Qnty	Rate	Amount
9/1.4	**Haulage excluding Loading and Unloading**								
	Haulage of materials by tipper excluding cost of loading, unloading and stacking			**LEAD Km**			**Qnty Tonne**		
	For BC & SAMI								
	Case-I : Surfaced road								
	a) Sand			55.00			295.00	6.70	**108,707.50**
	b) Aggregates			55.00			577.00	6.70	**212,624.50**
	c) Cement			135.00			0.00	6.70	**0.00**
	d) Bitumen			135.00			35.00	6.70	**31,657.50**
	Case-II : Unsurfaced Gravelled Road								
	a) Sand			2.00			295.00	8.40	**4,956.00**
	b) Aggregates			2.00			577.00	8.40	**9,693.60**
	c) Cement			0.00			0.00	8.40	**0.00**
	d) Bitumen			0.00			35.00	8.40	**0.00**
	For CT Sub base & CT base								
	Case-I : Surfaced road								
	a) Sand			55.00			2282.00	6.70	**840,917.00**
	b) Aggregates			55.00			2297.0	6.70	**846,444.50**
	c) Cement			135.00			160.0	6.70	**144,720.00**
	d) Bitumen			135.00			0.0	6.70	**0.00**
	Case-II : Unsurfaced Gravelled Road								
	a) Sand			2.00			2282.0	8.40	**38,337.60**
	b) Aggregates			2.00			2297.0	8.40	**38,589.60**
	c) Cement			0.00			160.0	8.40	**0.00**
	d) Bitumen			0.00			0.0	8.40	**0.00**
									14,862,922.30
								Say	**14,862,922.00**

Ma Jun

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

QUANTITY CALCULATION FOR PAVEMENT MATERIALS UNDER CARRIAGE ITEM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Ref Item no	Description	Requirement for	Cement	Bitumen	Aggregate	Crushed Sand	Total requirement from estimate	Individual requirement for whole length of road			
								Cement	Bitumen	Aggregate	Sand
			ton	ton	m^3	m^3		ton	ton	m^3	m^3
1	2	3	4	5	6	7	8	9	10	11	12
1/4.6	CT Sub Base	300 m^3	24.00		288.00	96.00	750.00 m^3	60		720.00	240.00
2/4.6	CT Base	300 m^3	24.00		144.00	240.00	1250.00 m^3	100		600.00	1000.00
			Total requirement for the whole length of the road =					**160.00**	**0.00**	**1320.00**	**1240.00**
							Ton/Unit quantity	1	1	1.74	1.84
							Total weight	**160.00**	**0.00**	**2297.00**	**2282.00**
								ton	**ton**	**ton**	**ton**
3/4.11	Penetration Coat	7500 m^2		0.250	97.50		5000.00 m^2		0.17	65.00	0.00
4/5.21	SAMI	10500.00 m^2		11.55	105.00		5000.00 m^2		5.50	50.00	0.00
5/5.8	Bituminous Concre	191.00 m^3		22.50	165.300	122.620	250.00 m^3		29.45	216.36	160.50
							Total requirement for the whole length of the road =		**35.12**	**331.36**	**160.50**
							Ton/Unit quantity		1	1.74	1.84
							Total weight		**35.00**	**577.00**	**295.00**
									ton	**ton**	**ton**

DETAIL ESTIMATE FOR MINOR JUNCTION & DEVELOPMENT OF LINK ROAD

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Sl/SOR	Description	Unit	L	B	H	No	Qnty	Rate	Amount
1/3.32	Excavation in Hilly Areas in Soil By Mechanical Means (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 .) Case-I : Disposal of cut material with all lifts and lead upto 1000 metres.	Cum	150.00	6.00	1.00	4.00	3600.00	124.00	446,400.00
2/3.19	**Compacting original ground supporting subgrade** (Loosening of the ground upto a level of 500 mm below the subgrade level, watered, graded and compacted in layers to meet requirement of table 300-2 for subgrade construction.)	Cum	150.00	6.00	0.500	4.00	1800.00	81.00	145,800.00
3/3.17	**Construction of Embankment with Material Deposited from Roadway Cutting** (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)	Cum	150.00	6.00	0.500	4.00	1800.00	172.00	309,600.00
4/3.18	**Construction of Subgrade and Earthen Shoulders** (Construction of subgrade 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)	Cum	150.00	6.00	0.500	4.00	1800.00	331.00	595,800.00
5/4.6 (i)	**Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Sub base** (Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, 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.)	Cum	150.00	3.75	0.150	4.00	337.50	3349.00	1,130,287.50
6/4.6(ii)	**Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Base** (Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, 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 base.)	Cum	150.00	3.75	0.250	4.00	562.50	3303.00	1,857,937.50

Mi Jun

Sl/SOR	Description	Unit	L	B	H	No	Qnty	Rate	Amount
7/4.11	**Penetration Coat Over Top Layer of Crushed Cement Concrete Base** (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)	Sqm	150.00	3.75		4.00	2250.00	31.00	69,750.00
8/5.21(iii)	**Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm** (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.)	Sqm	150.00	3.750		4.00	2250.00	94.00	211,500.00
9/5.8	**Bituminous Concrete** (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 % 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) Case-I Using Bitumen 60/70 grade (i)for Grading-I (13 mm nominal size)	Cum	150.00	3.750	0.05	4.00	112.50	11529.00	1,297,012.50
10/1.1	**Loading and unloading of Lime, Aggregates, Stone boulder,Brick Aggregates etc. by manual means**		Qnty taken from Pavment Qnty Calculation						
	i) Loading of aggregates	Cum					743.1	105.0	78,025.50
	ii) Loading of sand	Cum					630.2	105.0	66,171.00
11/1.9	**Loading and unloading of Bitumen drums by manual means including a lead upto 30m**								
	i)Unloading of Bitumen drums by manual means including a lead upto 30m	ton	Qnty taken from Pavment Qnty Calculation				16.00	105.00	1,680.00
12/1.3	**Loading and unloading of Cement by manual means including a lead upto 30m**								
	i)Cement by manual means including a lead upto 30m	ton	Qnty taken from Pavment Qnty Calculation				72.00	215.00	15,480.00

Sl/SOR	Description	Unit	L	B	H	No	Qnty	Rate	Amount
9/1.4	**Haulage excluding Loading and Unloading**								
	Haulage of materials by tipper excluding cost of loading, unloading and stacking			**LEAD Km**			**Qnty Tonne**		
	For BC & SAMI								
	Case-I : Surfaced road								
	a) Sand			55.00			133.00	6.70	**49,010.50**
	b) Aggregates			55.00			259.00	6.70	**95,441.50**
	c) Cement			135.00			0.00	6.70	**0.00**
	d) Bitumen			135.00			16.00	6.70	**14,472.00**
	Case-II : Unsurfaced Gravelled Road								
	a) Sand			2.00			133.00	8.40	**2,234.40**
	b) Aggregates			2.00			259.00	8.40	**4,351.20**
	c) Cement			0.00			0.00	8.40	**0.00**
	d) Bitumen			0.00			16.00	8.40	**0.00**
	For CT Sub base & CT base								
	Case-I : Surfaced road								
	a) Sand			55.00			1027.00	6.70	**378,449.50**
	b) Aggregates			55.00			1034.0	6.70	**381,029.00**
	c) Cement			135.00			72.0	6.70	**65,124.00**
	d) Bitumen			135.00			0.0	6.70	**0.00**
	Case-II : Unsurfaced Gravelled Road								
	a) Sand			2.00			1027.0	8.40	**17,253.60**
	b) Aggregates			2.00			1034.0	8.40	**17,371.20**
	c) Cement			0.00			72.0	8.40	**0.00**
	d) Bitumen			0.00			0.0	8.40	**0.00**
									7,250,180.90
								Say	**7,250,181.00**

Mi Jun

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

QUANTITY CALCULATION FOR PAVEMENT MATERIALS UNDER CARRIAGE ITEM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Ref Item no	Description	Requirement for	Cement	Bitumen	Aggregate	Crushed Sand	Total requirement from estimate	Individual requirement for whole length of road			
								Cement	Bitumen	Aggregate	Sand
			ton	ton	m^3	m^3		ton	ton	m^3	m^3
1	2	3	4	5	6	7	8	9	10	11	12
1/4.6	CT Sub Base	300 m^3	24.00		288.00	96.00	337.50 m^3	27		324.00	108.00
2/4.6	CT Base	300 m^3	24.00		144.00	240.00	562.50 m^3	45		270.00	450.00
			Total requirement for the whole length of the road =					**72.00**	**0.00**	**594.00**	**558.00**
							Ton/Unit quantity	1	1	1.74	1.84
							Total weight	**72.00**	**0.00**	**1034.00**	**1027.00**
								ton	**ton**	**ton**	**ton**
3/4.11	Penetration Coat	7500 m^2		0.250	97.50		2250.00 m^2		0.08	29.25	0.00
4/5.21	SAMI	10500.00 m^2		11.55	105.00		2250.00 m^2		2.48	22.50	0.00
5/5.8	Bituminous Concre	191.00 m^3		22.50	165.300	122.620	112.50 m^3		13.25	97.36	72.22
							Total requirement for the whole length of the road =		**15.81**	**149.11**	**72.22**
							Ton/Unit quantity		1	1.74	1.84
							Total weight		**16.00**	**259.00**	**133.00**
									ton	**ton**	**ton**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

COST ESTIMATE FOR DEVELOPMENT OF DUMPING YARD

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Sl/SOR	Description	Unit	L	B	H	Quantity	Rate	Amount
1/A7	Spreading & Compaction of Roadway cutting and excavation from drain and foundation of other structures surplus material in layers not exceeding 300mm thickness at selected displosal location by Dozer at least four passes including construction of approach road to dumping site.	Cum	Quantity taken and calculated from abstract of Earth Work			1186755.69	13.00	15,427,823.97
2	Construction of Gabion toe wall for 2.0 m wall	Rm	600	Ref Gabion wall location		600.00	9884.10	5,930,460.00
3	Construction of Gabion toe wall for 3.0 m wall	Rm	500			500.00	19803.90	9,901,950.00
4	Construction of Plum toe wall for 2.0 wall	Rm	300	Ref Toe wall location		300.00	13392.71	4,017,813.00
5	Construction of Plum toe wall for 3.0 wall	Rm	300			300.00	23655.62	7,096,686.00

Grand Total of Earth work & Side Drain **42,374,733**

(Rupees four crore twenty three lakh seventy four thousand seven hundred thirty three) only

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)
Length of road : 16.16 Km

CLEARING AND GRUBBING OF ROAD LAND

Sr No	Location in Kms		Length in m	Average width (m)	Area (Sqm)	Remarks
	From	To				
1	58800.0	59000.0	200.00	8.00	1600.00	Existing Road
2	59000.0	60000.0	1000.00	0.00	0.00	Existing Road
3	60000.0	61000.0	1000.00	24.00	24000.00	New Alignment
4	61000.0	62000.0	1000.00	24.00	24000.00	New Alignment
5	62000.0	63000.0	1000.00	24.00	24000.00	New Alignment
6	63000.0	64000.0	1000.00	24.00	24000.00	New Alignment
7	64000.0	65000.0	1000.00	24.00	24000.00	New Alignment
8	65000.0	66000.0	1000.00	24.00	24000.00	New Alignment
9	66000.0	67000.0	1000.00	24.00	24000.00	New Alignment
10	67000.0	68000.0	1000.00	24.00	24000.00	New Alignment
11	68000.0	69000.0	1000.00	24.00	24000.00	New Alignment
12	69000.0	70000.0	1000.00	24.00	24000.00	New Alignment
13	70000.0	71000.0	1000.00	24.00	24000.00	New Alignment
14	71000.0	72000.0	1000.00	24.00	24000.00	New Alignment
15	72000.0	73000.0	1000.00	24.00	24000.00	New Alignment
16	73000.0	74000.0	1000.00	24.00	24000.00	New Alignment
17	74000.0	75000.0	1000.00	24.00	24000.00	New Alignment
	Total		**16200**		**361600**	
SUMMARY						
A	In area of light jungle		**=**	**1600.00**	**Sqm**	
B	In area of thorny jungle		**=**	**360000.00**	**Sqm**	

CLEAR

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)
Length of road : 16.16 Km

DETAILS OF CUTTING DOWN TREES

S.N	Chainage		No of Trees With Grith				Remarks
	From	To	30-60 Cm	60-90 Cm	90-180Cm	More than 180 Cm	
2.0	58.8	59.0	0	0	0		Existing Road
3.0	59.0	60.0	0	0	0	1	Existing Road
4.0	60.0	61.0	18	10	3	1	New Alignment
5.0	61.0	62.0	31	16	7	3	New Alignment
6.0	62.0	63.0	27	12	3	1	New Alignment
7.0	63.0	64.0	25	10	3	2	New Alignment
8.0	64.0	65.0	26	11	4	1	New Alignment
9.0	65.0	66.0	23	8	3	1	New Alignment
10.0	66.0	67.0	29	14	5	3	New Alignment
11.0	67.0	68.0	29	14	5	1	New Alignment
12.0	68.0	69.0	31	16	7	2	New Alignment
13.0	69.0	70.0	32	17	8	1	New Alignment
14.0	70.0	71.0	33	18	9	2	New Alignment
15.0	71.0	72.0	29	14	5	1	New Alignment
16.0	72.0	73.0	27	12	3	1	New Alignment
17.0	73.0	74.0	27	12	3	3	New Alignment
18.0	74.0	75.0	28	13	4	1	New Alignment
	Total		**415**	**197**	**72**	**25**	

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

ABSTRACT OF EARTHWORK QUANTITY

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Sr.No.	Chainage		Volume of Cutting in Cum	Classification of Soil in %			Volume of cutting			Volume of filling in Cum	Volume of embankment in Cum	Volume of Subgrade in Cum
	To	From		Ordinary soil	Ordinary rock	Hard rock	Ordinary soil	Ordinary rock	Hard rock			
1.0	58.8	59.0	265.400	35.0	55.0	10.0	92.890	145.970	26.540	34.630	0.000	34.630
2.0	59.0	60.0	0.000	45.0	45.0	10.0	0.000	0.000	0.000	0.000	0.000	0.000
3.0	60.0	61.0	37444.300	47.0	45.0	8.0	17598.821	16849.935	2995.544	12548.165	9121.200	3426.965
4.0	61.0	62.0	70120.300	46.0	47.0	7.0	32255.338	32956.541	4908.421	7153.775	4589.740	2564.035
5.0	62.0	63.0	55642.400	50.0	42.0	8.0	27821.200	23369.808	4451.392	3756.360	2305.745	1450.615
6.0	63.0	64.0	103868.400	54.0	40.0	6.0	56088.936	41547.360	6232.104	709.100	372.350	336.750
7.0	64.0	65.0	76350.100	47.0	48.0	5.0	35884.547	36648.048	3817.505	1541.125	1036.290	504.835
8.0	65.0	66.0	84615.100	40.0	48.0	12.0	33846.040	40615.248	10153.812	395.275	13.375	381.900
9.0	66.0	67.0	113351.400	45.0	45.0	10.0	51008.130	51008.130	11335.140	24700.285	21744.625	2955.660
10.0	67.0	68.0	285029.000	50.0	45.0	5.0	142514.500	128263.050	14251.450	2260.190	1949.940	310.250
11.0	68.0	69.0	437305.600	50.0	45.0	5.0	218652.800	196787.520	21865.280	0.000	0.000	0.000
12.0	69.0	70.0	296356.700	50.0	45.0	5.0	148178.350	133360.515	14817.835	910.730	541.785	368.945
13.0	70.0	71.0	119591.100	50.0	45.0	5.0	59795.550	53815.995	5979.555	1338.645	862.540	476.105
14.0	71.0	72.0	67045.300	50.0	45.0	5.0	33522.650	30170.385	3352.265	856.770	207.610	649.160
15.0	72.0	73.0	62914.100	50.0	45.0	5.0	31457.050	28311.345	3145.705	77.320	0.000	77.320
16.0	73.0	74.0	115273.000	50.0	45.0	5.0	57636.500	51872.850	5763.650	308.110	0.645	307.465
17.0	74.0	75.0	74970.000	50.0	45.0	5.0	37485.000	33736.500	3748.500	10329.890	8591.590	1738.300
		Total	**2000142.20**				**983838.30**	**899459.20**	**116844.70**	**66920.37**	**51337.44**	**15582.94**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Length of drain

Sr.No.	Chainage in m		Length in m	Type	Remarks
	From	To			
1	58840	59000	160	Type-1	Trapezoidal PCC drain
2	59000	60000	1000	Type-1	Trapezoidal PCC drain
4	60000	61000	1000	Type-1	Trapezoidal PCC drain
5	61000	62000	1000	Type-1	Trapezoidal PCC drain
6	62000	63000	1000	Type-1	Trapezoidal PCC drain
7	63000	64000	1000	Type-1	Trapezoidal PCC drain
8	64000	65000	1000	Type-1	Trapezoidal PCC drain
9	65000	66000	1000	Type-1	Trapezoidal PCC drain
10	66000	67000	1000	Type-1	Trapezoidal PCC drain
11	67000	68000	1000	Type-1	Trapezoidal PCC drain
12	68000	69000	1000	Type-1	Trapezoidal PCC drain
13	69000	70000	1000	Type-1	Trapezoidal PCC drain
14	70000	71000	1000	Type-1	Trapezoidal PCC drain
15	71000	72000	1000	Type-1	Trapezoidal PCC drain
16	72000	73000	1000	Type-1	Trapezoidal PCC drain
17	73000	74000	1000	Type-1	Trapezoidal PCC drain
18	74000	75000	1000	Type-1	Trapezoidal PCC drain
		Total	**16160.00**		

Summary		**Length of drain in m**
Length of drain on Hill side	=	16160.0
Length of drain on Valley side at Box Cutting port	=	5590.0
Length of bridge	=	560.0
Catch water drain	=	1000.0
Culvert catchpit opening	=	360.0
Net length of line drain	=	**21830**

Type-1 **21830** **Type-2** **0**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

LOCATION OF RETAINING WALL

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
1	60065	60075	10	3	RHS	Plum Concrete
2	60075	60085	10	2	RHS	Plum Concrete
3	60085	60095	10	2	RHS	Plum Concrete
4	60095	60105	10	2	RHS	Plum Concrete
5	60115	60125	10	4	RHS	Plum Concrete
6	60125	60135	10	4	RHS	Plum Concrete
7	60155	60165	10	3	RHS	Plum Concrete
8	60165	60175	10	2	RHS	Plum Concrete
9	60185	60195	10	3	RHS	Plum Concrete
10	60195	60205	10	2	RHS	Plum Concrete
11	60315	60325	10	4	RHS	Plum Concrete
12	60325	60335	10	6	RHS	RCC Relief Shelves
13	60335	60345	10	4	RHS	Plum Concrete
14	60345	60355	10	2	RHS	Plum Concrete
15	60355	60365	10	2	RHS	Plum Concrete
16	60365	60375	10	3	RHS	Plum Concrete
17	60375	60385	10	3	RHS	Plum Concrete
18	60385	60395	10	3	RHS	Plum Concrete
19	60395	60405	10	3	RHS	Plum Concrete
20	60405	60415	10	4	RHS	Plum Concrete
21	60415	60425	10	4	RHS	Plum Concrete
22	60425	60435	10	4	RHS	Plum Concrete
23	60435	60445	10	5	RHS	RCC Relief Shelves
24	60445	60455	10	4	RHS	Plum Concrete
25	60455	60465	10	4	RHS	Plum Concrete
26	60465	60475	10	4	RHS	Plum Concrete
27	60475	60485	10	4	RHS	Plum Concrete
28	60485	60495	10	5	RHS	RCC Relief Shelves
29	60495	60505	10	5	RHS	RCC Relief Shelves
30	60505	60515	10	4	RHS	Plum Concrete
31	60515	60525	10	5	RHS	RCC Relief Shelves
32	60525	60535	10	5	RHS	RCC Relief Shelves
33	60535	60545	10	6	RHS	RCC Relief Shelves
34	60545	60555	10	5	RHS	RCC Relief Shelves
35	60555	60565	10	5	RHS	RCC Relief Shelves
36	60565	60575	10	5	RHS	RCC Relief Shelves
37	60575	60585	10	8	RHS	RCC Relief Shelves
38	60585	60595	10	8	RHS	RCC Relief Shelves

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
39	60595	60605	10	8	RHS	RCC Relief Shelves
40	60605	60615	10	3	RHS	Plum Concrete
41	60615	60625	10	2	RHS	Plum Concrete
42	60625	60635	10	4	RHS	Plum Concrete
43	60635	60645	10	6	RHS	RCC Relief Shelves
44	60645	60655	10	8	RHS	RCC Relief Shelves
45	60655	60665	10	8	RHS	RCC Relief Shelves
46	60665	60675	10	6	RHS	RCC Relief Shelves
47	60675	60685	10	6	RHS	RCC Relief Shelves
48	60685	60695	10	5	RHS	RCC Relief Shelves
49	60695	60705	10	4	RHS	Plum Concrete
50	60755	60765	10	2	RHS	Plum Concrete
51	60835	60845	10	4	RHS	Plum Concrete
52	60845	60855	10	2	RHS	Plum Concrete
53	60855	60865	10	4	RHS	Plum Concrete
54	60865	60875	10	4	RHS	Plum Concrete
55	60875	60885	10	3	RHS	Plum Concrete
56	60885	60895	10	4	RHS	Plum Concrete
57	60895	60905	10	4	RHS	Plum Concrete
58	60905	60915	10	4	RHS	Plum Concrete
59	60915	60925	10	4	RHS	Plum Concrete
60	60925	60935	10	4	RHS	Plum Concrete
61	60935	60945	10	4	RHS	Plum Concrete
62	60945	60955	10	4	RHS	Plum Concrete
63	60955	60965	10	4	RHS	Plum Concrete
64	60965	60975	10	4	RHS	Plum Concrete
65	60975	60985	10	5	RHS	RCC Relief Shelves
66	60985	60995	10	4	RHS	Plum Concrete
67	60995	61005	10	3	RHS	Plum Concrete
68	61005	61015	10	3	RHS	Plum Concrete
69	61025	61035	10	4	RHS	Plum Concrete
70	61035	61045	10	3	RHS	Plum Concrete
71	61045	61055	10	2	RHS	Plum Concrete
72	61065	61075	10	2	RHS	Plum Concrete
73	61085	61095	10	2	RHS	Plum Concrete
74	61095	61105	10	4	RHS	Plum Concrete
75	61105	61115	10	6	RHS	RCC Relief Shelves
76	61115	61125	10	10	RHS	RCC Relief Shelves
77	61125	61135	10	6	RHS	RCC Relief Shelves
78	61135	61145	10	3	RHS	Plum Concrete
79	61145	61155	10	5	RHS	RCC Relief Shelves
80	61155	61165	10	5	RHS	RCC Relief Shelves
81	61165	61175	10	4	RHS	Plum Concrete
82	61175	61185	10	4	RHS	Plum Concrete

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
83	61185	61195	10	5	RHS	RCC Relief Shelves
84	61195	61205	10	10	RHS	RCC Relief Shelves
85	61205	61215	10	10	RHS	RCC Relief Shelves
86	61215	61225	10	6	RHS	RCC Relief Shelves
87	61225	61235	10	6	RHS	RCC Relief Shelves
88	61235	61245	10	5	RHS	RCC Relief Shelves
89	61255	61265	10	3	RHS	Plum Concrete
90	61305	61315	10	5	RHS	RCC Relief Shelves
91	61315	61325	10	4	RHS	Plum Concrete
92	61395	61405	10	5	RHS	RCC Relief Shelves
93	61405	61415	10	12	RHS	RCC Relief Shelves
94	61415	61425	10	8	RHS	RCC Relief Shelves
95	61425	61435	10	3	RHS	Plum Concrete
96	61455	61465	10	2	RHS	Plum Concrete
97	61465	61475	10	3	RHS	Plum Concrete
98	61475	61485	10	4	RHS	Plum Concrete
99	61485	61495	10	2	RHS	Plum Concrete
100	61495	61505	10	2	RHS	Plum Concrete
101	61505	61515	10	2	RHS	Plum Concrete
102	61515	61525	10	3	RHS	Plum Concrete
103	61525	61535	10	4	RHS	Plum Concrete
104	61555	61565	10	4	RHS	Plum Concrete
105	61565	61575	10	8	RHS	RCC Relief Shelves
106	61575	61585	10	10	RHS	RCC Relief Shelves
107	61585	61595	10	10	RHS	RCC Relief Shelves
108	61595	61605	10	8	RHS	RCC Relief Shelves
109	61605	61615	10	5	RHS	RCC Relief Shelves
110	61615	61625	10	5	RHS	RCC Relief Shelves
111	61625	61635	10	3	RHS	Plum Concrete
112	61715	61725	10	2	RHS	Plum Concrete
113	61725	61735	10	4	RHS	Plum Concrete
114	61735	61745	10	5	RHS	RCC Relief Shelves
115	61785	61795	10	3	RHS	Plum Concrete
116	61795	61805	10	4	LHS	Plum Concrete
117	61795	61805	10	6	RHS	RCC Relief Shelves
118	61855	61865	10	12	RHS	RCC Relief Shelves
119	61865	61875	10	8	RHS	RCC Relief Shelves
120	61875	61885	10	2	RHS	Plum Concrete
121	62165	62175	10	8	RHS	RCC Relief Shelves
122	62175	62185	10	3	LHS	Plum Concrete
123	62175	62185	10	10	RHS	RCC Relief Shelves
124	62185	62195	10	2	LHS	Plum Concrete
125	62185	62195	10	8	RHS	RCC Relief Shelves
126	62195	62205	10	2	LHS	Plum Concrete

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
127	62195	62205	10	6	RHS	RCC Relief Shelves
128	62205	62215	10	4	RHS	Plum Concrete
129	62215	62225	10	3	RHS	Plum Concrete
130	62225	62235	10	2	RHS	Plum Concrete
131	62245	62255	10	2	RHS	Plum Concrete
132	62255	62265	10	4	RHS	Plum Concrete
133	62265	62275	10	5	RHS	RCC Relief Shelves
134	62275	62285	10	6	RHS	RCC Relief Shelves
135	62285	62295	10	5	RHS	RCC Relief Shelves
136	62295	62305	10	3	RHS	Plum Concrete
137	62325	62335	10	2	RHS	Plum Concrete
138	62335	62345	10	5	RHS	RCC Relief Shelves
139	62345	62355	10	5	RHS	RCC Relief Shelves
140	62355	62365	10	2	RHS	Plum Concrete
141	62365	62375	10	2	RHS	Plum Concrete
142	62425	62435	10	3	RHS	Plum Concrete
143	62435	62445	10	4	RHS	Plum Concrete
144	62445	62455	10	3	RHS	Plum Concrete
145	62505	62515	10	3	RHS	Plum Concrete
146	62515	62525	10	4	RHS	Plum Concrete
147	62525	62535	10	4	RHS	Plum Concrete
148	62535	62545	10	3	RHS	Plum Concrete
149	62575	62585	10	3	RHS	Plum Concrete
150	62585	62595	10	4	RHS	Plum Concrete
151	62595	62605	10	6	RHS	RCC Relief Shelves
152	62605	62615	10	4	RHS	Plum Concrete
153	62615	62625	10	2	RHS	Plum Concrete
154	62635	62645	10	2	RHS	Plum Concrete
155	62645	62655	10	4	RHS	Plum Concrete
156	62655	62665	10	2	RHS	Plum Concrete
157	63105	63115	10	2	RHS	Plum Concrete
158	63215	63225	10	2	RHS	Plum Concrete
159	63275	63285	10	2	LHS	Plum Concrete
160	63275	63285	10	3	RHS	Plum Concrete
161	63285	63295	10	5	LHS	RCC Relief Shelves
162	63285	63295	10	5	RHS	RCC Relief Shelves
163	63475	63485	10	2	RHS	Plum Concrete
164	63675	63685	10	3	RHS	Plum Concrete
165	63685	63695	10	3	RHS	Plum Concrete
166	63695	63705	10	2	RHS	Plum Concrete
167	64115	64125	10	3	RHS	Plum Concrete
168	64125	64135	10	4	RHS	Plum Concrete
169	64135	64145	10	4	RHS	Plum Concrete
170	64145	64155	10	2	RHS	Plum Concrete

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
171	64155	64165	10	4	RHS	Plum Concrete
172	64165	64175	10	3	RHS	Plum Concrete
173	64315	64325	10	2	LHS	Plum Concrete
174	64315	64325	10	3	RHS	Plum Concrete
175	64325	64335	10	6	LHS	RCC Relief Shelves
176	64325	64335	10	6	RHS	RCC Relief Shelves
177	64335	64345	10	5	LHS	RCC Relief Shelves
178	64335	64345	10	8	RHS	RCC Relief Shelves
179	64345	64355	10	2	RHS	Plum Concrete
180	64955	64965	10	2	RHS	Plum Concrete
181	64965	64975	10	3	RHS	Plum Concrete
182	64975	64985	10	2	RHS	Plum Concrete
183	65215	65225	10	2	RHS	Plum Concrete
184	65225	65235	10	3	RHS	Plum Concrete
185	65235	65245	10	3	RHS	Plum Concrete
186	65245	65255	10	5	RHS	RCC Relief Shelves
187	65335	65345	10	3	RHS	Plum Concrete
188	65675	65685	10	2	RHS	Plum Concrete
189	65725	65735	10	3	RHS	Plum Concrete
190	65735	65745	10	3	RHS	Plum Concrete
191	65745	65755	10	4	RHS	Plum Concrete
192	66095	66105	10	10	RHS	RCC Relief Shelves
193	66125	66135	10	4	RHS	Plum Concrete
194	66135	66145	10	3	RHS	Plum Concrete
195	66145	66155	10	4	RHS	Plum Concrete
196	66155	66165	10	4	RHS	Plum Concrete
197	66165	66175	10	8	RHS	RCC Relief Shelves
198	66175	66185	10	8	RHS	RCC Relief Shelves
199	66185	66195	10	8	RHS	RCC Relief Shelves
200	66195	66205	10	8	RHS	RCC Relief Shelves
201	66205	66215	10	12	RHS	RCC Relief Shelves
202	66215	66225	10	14	RHS	RCC Relief Shelves
203	66225	66235	10	12	RHS	RCC Relief Shelves
204	66235	66245	10	6	RHS	RCC Relief Shelves
205	66245	66255	10	10	RHS	RCC Relief Shelves
206	66255	66265	10	12	RHS	RCC Relief Shelves
207	66265	66275	10	10	RHS	RCC Relief Shelves
208	66275	66285	10	6	RHS	RCC Relief Shelves
209	66285	66295	10	10	RHS	RCC Relief Shelves
210	66295	66305	10	10	RHS	RCC Relief Shelves
211	66305	66315	10	12	RHS	RCC Relief Shelves
212	66315	66325	10	12	RHS	RCC Relief Shelves
213	66325	66335	10	10	RHS	RCC Relief Shelves
214	66335	66345	10	5	RHS	RCC Relief Shelves

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
215	66345	66355	10	3	RHS	Plum Concrete
216	66355	66365	10	6	RHS	RCC Relief Shelves
217	66365	66375	10	4	LHS	Plum Concrete
218	66365	66375	10	14	RHS	RCC Relief Shelves
219	66375	66385	10	10	LHS	RCC Relief Shelves
220	66375	66385	10	14	RHS	RCC Relief Shelves
221	66385	66395	10	12	LHS	RCC Relief Shelves
222	66385	66395	10	14	RHS	RCC Relief Shelves
223	66395	66405	10	10	LHS	RCC Relief Shelves
224	66395	66405	10	14	RHS	RCC Relief Shelves
225	66405	66415	10	5	LHS	RCC Relief Shelves
226	66405	66415	10	14	RHS	RCC Relief Shelves
227	66415	66425	10	10	RHS	RCC Relief Shelves
228	66425	66435	10	8	RHS	RCC Relief Shelves
229	66435	66445	10	8	RHS	RCC Relief Shelves
230	66445	66455	10	8	RHS	RCC Relief Shelves
231	66455	66465	10	5	RHS	RCC Relief Shelves
232	66475	66485	10	12	RHS	RCC Relief Shelves
233	66485	66495	10	14	RHS	RCC Relief Shelves
234	66495	66505	10	14	RHS	RCC Relief Shelves
235	66505	66515	10	4	RHS	Plum Concrete
236	66515	66525	10	5	RHS	RCC Relief Shelves
237	66525	66535	10	8	RHS	RCC Relief Shelves
238	66535	66545	10	10	RHS	RCC Relief Shelves
239	66545	66555	10	10	RHS	RCC Relief Shelves
240	66555	66565	10	10	RHS	RCC Relief Shelves
241	66565	66575	10	10	RHS	RCC Relief Shelves
242	66575	66585	10	10	RHS	RCC Relief Shelves
243	66585	66595	10	6	RHS	RCC Relief Shelves
244	66595	66605	10	3	RHS	Plum Concrete
245	66615	66625	10	2	RHS	Plum Concrete
246	66625	66635	10	4	RHS	Plum Concrete
247	66755	66765	10	6	RHS	RCC Relief Shelves
248	66765	66775	10	4	RHS	Plum Concrete
249	66775	66785	10	4	RHS	Plum Concrete
250	66785	66795	10	5	RHS	RCC Relief Shelves
251	66795	66805	10	4	RHS	Plum Concrete
252	67025	67035	10	3	RHS	Plum Concrete
253	67035	67045	10	3	RHS	Plum Concrete
254	67335	67345	10	5	RHS	RCC Relief Shelves
255	67345	67355	10	14	RHS	RCC Relief Shelves
256	67355	67365	10	10	RHS	RCC Relief Shelves
257	67375	67385	10	3	RHS	Plum Concrete
258	67385	67395	10	4	RHS	Plum Concrete

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
259	69625	69635	10	3	RHS	Plum Concrete
260	69635	69645	10	4	RHS	Plum Concrete
261	69645	69655	10	5	RHS	RCC Relief Shelves
262	69655	69665	10	6	RHS	RCC Relief Shelves
263	69665	69675	10	8	RHS	RCC Relief Shelves
264	69675	69685	10	6	RHS	RCC Relief Shelves
265	69685	69695	10	6	RHS	RCC Relief Shelves
266	69695	69705	10	2	RHS	Plum Concrete
267	70045	70055	10	4	RHS	Plum Concrete
268	70115	70125	10	5	RHS	RCC Relief Shelves
269	70725	70735	10	3	RHS	Plum Concrete
270	70735	70745	10	5	RHS	RCC Relief Shelves
271	70745	70755	10	3	RHS	Plum Concrete
272	70765	70775	10	3	RHS	Plum Concrete
273	70775	70785	10	3	RHS	Plum Concrete
274	70785	70795	10	3	RHS	Plum Concrete
275	70795	70805	10	2	RHS	Plum Concrete
276	70855	70865	10	2	RHS	Plum Concrete
277	70865	70875	10	3	RHS	Plum Concrete
278	71085	71095	10	3	RHS	Plum Concrete
279	71095	71105	10	2	RHS	Plum Concrete
280	71105	71115	10	2	RHS	Plum Concrete
281	71115	71125	10	5	RHS	RCC Relief Shelves
282	71155	71165	10	2	RHS	Plum Concrete
283	71165	71175	10	2	RHS	Plum Concrete
284	71175	71185	10	3	RHS	Plum Concrete
285	71185	71195	10	4	RHS	Plum Concrete
286	71225	71235	10	2	RHS	Plum Concrete
287	71615	71625	10	3	RHS	Plum Concrete
288	71625	71635	10	3	RHS	Plum Concrete
289	71635	71645	10	4	RHS	Plum Concrete
290	71645	71655	10	3	RHS	Plum Concrete
291	71895	71905	10	4	RHS	Plum Concrete
292	71905	71915	10	4	RHS	Plum Concrete
293	71915	71925	10	4	RHS	Plum Concrete
294	71925	71935	10	3	RHS	Plum Concrete
295	72135	72145	10	2	RHS	Plum Concrete
296	72505	72515	10	2	RHS	Plum Concrete
297	72825	72835	10	2	RHS	Plum Concrete
298	73155	73165	10	2	RHS	Plum Concrete
299	73165	73175	10	4	RHS	Plum Concrete
300	73175	73185	10	3	RHS	Plum Concrete
301	73365	73375	10	3	RHS	Plum Concrete
302	73375	73385	10	3	RHS	Plum Concrete

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
303	73595	73605	10	2	RHS	Plum Concrete
304	73635	73645	10	3	RHS	Plum Concrete
305	73665	73675	10	2	RHS	Plum Concrete
306	73675	73685	10	3	RHS	Plum Concrete
307	73735	73745	10	3	RHS	Plum Concrete
308	74055	74065	10	2	RHS	Plum Concrete
309	74135	74145	10	2	RHS	Plum Concrete
310	74145	74155	10	2	RHS	Plum Concrete
311	74155	74165	10	3	RHS	Plum Concrete
312	74165	74175	10	5	RHS	RCC Relief Shelves
313	74175	74185	10	2	LHS	Plum Concrete
314	74175	74185	10	8	RHS	RCC Relief Shelves
315	74185	74195	10	8	RHS	RCC Relief Shelves
316	74195	74205	10	8	RHS	RCC Relief Shelves
317	74205	74215	10	8	RHS	RCC Relief Shelves
318	74215	74225	10	8	RHS	RCC Relief Shelves
319	74225	74235	10	2	LHS	RCC Relief Shelves
320	74225	74235	10	5	RHS	Plum Concrete
321	74235	74245	10	5	RHS	RCC Relief Shelves
322	74245	74255	10	5	RHS	RCC Relief Shelves
323	74255	74265	10	2	RHS	RCC Relief Shelves
324	74265	74275	10	2	RHS	Plum Concrete
325	74275	74285	10	3	RHS	Plum Concrete
326	74285	74295	10	2	LHS	Plum Concrete
327	74285	74295	10	5	RHS	Plum Concrete
328	74395	74405	10	5	RHS	RCC Relief Shelves
329	74525	74535	10	2	RHS	RCC Relief Shelves
330	74535	74545	10	3	RHS	Plum Concrete
331	74545	74555	10	5	RHS	Plum Concrete
332	74555	74565	10	5	RHS	RCC Relief Shelves
333	74565	74575	10	5	RHS	RCC Relief Shelves
334	74575	74585	10	6	RHS	RCC Relief Shelves
335	74585	74595	10	6	RHS	RCC Relief Shelves
336	74595	74605	10	2	LHS	RCC Relief Shelves
337	74595	74605	10	6	RHS	Plum Concrete
338	74605	74615	10	3	LHS	RCC Relief Shelves
339	74605	74615	10	8	RHS	Plum Concrete
340	74615	74625	10	3	LHS	RCC Relief Shelves
341	74615	74625	10	8	RHS	Plum Concrete
342	74625	74635	10	2	LHS	RCC Relief Shelves
343	74625	74635	10	8	RHS	Plum Concrete
344	74635	74645	10	6	RHS	RCC Relief Shelves
345	74645	74655	10	5	RHS	RCC Relief Shelves
346	74655	74665	10	4	RHS	RCC Relief Shelves

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
347	74665	74675	10	3	LHS	Plum Concrete
348	74665	74675	10	8	RHS	Plum Concrete
349	74675	74685	10	12	LHS	RCC Relief Shelves
350	74675	74685	10	14	RHS	RCC Relief Shelves
351	74685	74695	10	12	LHS	RCC Relief Shelves
352	74685	74695	10	14	RHS	RCC Relief Shelves
353	74695	74705	10	3	RHS	RCC Relief Shelves
354	74815	74825	10	2	RHS	Plum Concrete
			3540			

SUMMARY

Total length of Retaining wall for 2.0 m Height	=	680	m
Total length of Retaining wall for 3.0 m Height	=	710	m
Total length of Retaining wall for 4.0 m Height	=	680	m
Total length of Retaining wall for 5.0 m Height	=	470	m
Total length of Retaining wall for 6.0 m Height	=	270	m
Total length of Retaining wall for 8.0 m Height	=	300	m
Total length of Retaining wall for 10.0 m Height	=	210	m
Total length of Retaining wall for 12.0 m Height	=	110	m
Total length of Retaining wall for 14.0 m Height	=	110	m

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)
Length of road : 16.16 Km

LOCATION OF BREAST WALL

Sr.No.	Chainage		Length in m	Height in m	Side
	From	To			
1	60103	60182	79.00	3.00	LHS
2	60515	60576	61.00	2.00	LHS
3	60783	60860	77.00	3.00	LHS
4	60784	60830	46.00	2.00	RHS
5	61010	61250	240.00	2.00	LHS
6	61420	61475	55.00	2.00	LHS
7	61810	61860	50.00	2.00	LHS
8	63396	63475	79.00	3.00	LHS
9	63385	63465	80.00	2.00	RHS
11	64170	64250	80.00	2.00	LHS
12	64650	64900	250.00	2.00	LHS
13	65240	65380	140.00	2.00	LHS
14	65425	65490	65.00	2.00	LHS
15	65750	65810	60.00	2.00	LHS
16	66005	66084	79.00	2.00	LHS
17	66440	66520	80.00	3.00	LHS
19	67450	67575	125.00	2.00	RHS
20	67895	67985	90.00	2.00	RHS
21	68010	68105	95.00	2.00	RHS
22	68330	68395	65.00	3.00	RHS
23	68520	68665	145.00	2.00	RHS
24	69295	69375	80.00	2.00	RHS
25	69870	70040	170.00	2.00	LHS
26	70125	70225	100.00	2.00	LHS
27	70680	70710	30.00	3.00	LHS
28	70825	70960	135.00	3.00	LHS
29	71000	71110	110.00	2.00	LHS
30	71780	71845	65.00	3.00	LHS
31	71870	71940	70.00	2.00	LHS
32	72250	72510	260.00	2.00	LHS
33	72850	72965	115.00	3.00	LHS
34	72990	73190	200.00	2.00	LHS
35	73290	73575	285.00	2.00	LHS
36	74405	74510	105.00	2.00	LHS
37	74828	74987	159.00	2.00	LHS
			3925.00		

SUMMARY

Total length of Breast wall for 2.0 m Height	=	3200.00 m
Total length of Breast wall for 3.0 m Height	=	725.00 m

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

LOCATION OF GABION WALL

Sr.No.	Chainage		Length in m	Height in m	Remarks
	From	To			
1	63625	64090	465.00	3.00	LHS
2	66845	69620	2775.00	2.00	LHS
3	Displosal Portion		500	3	Disposal Yard
4	Displosal Portion		600	2	Disposal Yard
			4340.000		

SUMMARY

Road work

Total length of Gabion wall for 2.0 m Height = 2775.00 m

Total length of Gabion wall for 3.0 m Height = 465.00 m

Dumping work

Total length of Gabion wall for 2.0 m Height = 600.00 m

Total length of Gabion wall for 3.0 m Height = 500.00 m

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

LOCATION OF TOE WALL

Sr.No.	Chainage		Length in m	Height in m	Remarks
	From	To			
1	61405	61415	10	2	RHS
2	61855	61865	10	2	RHS
3	66205	66215	10	2	RHS
4	66215	66225	10	3	RHS
5	66225	66235	10	2	RHS
6	66255	66265	10	2	RHS
7	66305	66315	10	2	RHS
8	66315	66325	10	2	RHS
9	66365	66375	10	3	RHS
10	66375	66385	10	3	RHS
11	66385	66395	10	2	LHS
12	66385	66395	10	3	RHS
13	66395	66405	10	3	RHS
14	66405	66415	10	3	RHS
15	66475	66485	10	2	RHS
16	66485	66495	10	3	RHS
17	66495	66505	10	3	RHS
18	67345	67355	10	3	RHS
19	74675	74685	10	3	LHS
20	74675	74685	10	3	RHS
21	74685	74695	10	3	LHS
22	74685	74695	10	3	RHS
25	Displosal Portion		300	3.00	
26	Displosal Portion		300	2.00	
			820.000		

SUMMARY

Road work

Total length of Toe wall for 2.0 m Height = 90.00 m

Total length of Toe wall for 3.0 m Height = 130.00 m

Dumping work

Total length of Toe wall for 2.0 m Height = 300.00 m

Total length of Toe wall for 3.0 m Height = 300.00 m

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

LOCATION OF BIO PROTECTION WORK

Sr.No.	Design		Length in m	Width in m	Area in Sqm	Soil/Rock Condition
	To	From				
1	60103	60182	79.00	7.00	553.00	Soil mixed boulder
2	60515	60576	61.00	7.00	427.00	Soil mixed boulder
3	60783	60860	77.00	7.00	539.00	Soil mixed boulder
4	60784	60830	46.00	7.00	322.00	Soil mixed boulder
5	61010	61250	240.00	7.00	1680.00	Soil mixed boulder
6	61420	61475	55.00	7.00	385.00	Soil mixed boulder
7	61760	61770	20.00	16.00	320.00	Soil mixed boulder
8	61810	61860	50.00	7.00	350.00	Soil mixed boulder
9	62740	62750	20.00	14.00	280.00	Soil mixed boulder
10	63385	63465	80.00	15.00	1200.00	Soil mixed boulder
11	63396	63475	79.00	7.00	553.00	Soil mixed boulder
12	64170	64250	80.00	7.00	560.00	Soil mixed boulder
13	64650	64900	250.00	7.00	1750.00	Soil mixed boulder
14	65240	65380	140.00	7.00	980.00	Soil mixed boulder
15	65425	65490	65.00	7.00	455.00	Soil mixed boulder
16	65750	65810	60.00	7.00	420.00	Soil mixed boulder
17	65810	66050	480.00	12.00	5760.00	Soil mixed boulder
18	66005	66084	79.00	7.00	553.00	Soil mixed boulder
19	66440	66520	80.00	7.00	560.00	Soil mixed boulder
20	66850	70950	8200.00	10.00	82000.00	Soil mixed boulder
21	71000	71110	110.00	7.00	770.00	Soil mixed boulder
22	71780	71845	65.00	7.00	455.00	Soil mixed boulder
23	71870	71940	70.00	7.00	490.00	Soil mixed boulder
24	72250	72510	260.00	7.00	1820.00	Soil mixed boulder
25	72850	72965	115.00	7.00	805.00	Soil mixed boulder
26	72990	73190	200.00	7.00	1400.00	Soil mixed boulder
27	73290	73575	285.00	7.00	1995.00	Soil mixed boulder
28	74405	74510	105.00	7.00	735.00	Soil mixed boulder
29	74828	74987	159.00	7.00	1113.00	Soil mixed boulder
		Total			**109230**	

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

LOCATION OF SINKING & SLIDING AREA

Sr.No.	Design		Length in m	Heigth in m	Site Condition	Soil/Rock Condition	Treatment Proposed
	To	From					
1	65380	65425	45	10	Sliding	Hard Rock / Boulder	Crib Work,Anchor Work & Rock-bolt Work
2	66084	66285	201	10	Sliding	Soil mixed boulder	Crib Work,Anchor Work & Rock-bolt Work
3	70710	70750	40	10	Sliding	Soil mixed boulder	Crib Work,Anchor Work & Rock-bolt Work
4	71893	71915	22	10	Sliding	Hard Rock / Boulder	Crib Work,Anchor Work & Rock-bolt Work
5	73152	73170	18	10	Sliding	Soil mixed boulder	Crib Work,Anchor Work & Rock-bolt Work

Summary

Total length of Sinking Zone = .00 m

Total length of Sliding Zone = 326.00 m

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

LIST OF PROPOSED CULVERTS

Sr. No.	Chainage (m)	Curve /Straight	Type	Span X Depth	Remarks
1	60328	58	BOX-TYPE-1	2 X 2	Proposed
2	60581	104	BOX-TYPE-1	2 X 2	Proposed
3	60769	55	BOX-TYPE-1	2 X 2	Proposed
4	60929	-150	BOX-TYPE-1	2 X 2	Proposed
5	61310	Straight	BOX-TYPE-1	2 X 2	Proposed
6	61662	48	BOX-TYPE-1	2 X 2	Proposed
7	61800	36	BOX-TYPE-1	2 X 2	Proposed
8	62079	75	BOX-TYPE-1	2 X 2	Proposed
9	62263	Straight	BOX-TYPE-1	2 X 2	Proposed
10	62453	-273	BOX-TYPE-1	2 X 2	Proposed
11	62711	Straight	BOX-TYPE-1	2 X 2	Proposed
12	62765	77	BOX-TYPE-1	2 X 2	Proposed
13	63105	100	BOX-TYPE-1	2 X 2	Proposed
14	63620	Straight	BOX-TYPE-1	2 X 2	Proposed
15	63912	60	BOX-TYPE-1	2 X 2	Proposed
16	64157	Straight	BOX-TYPE-1	2 X 2	Proposed
17	64330	171	BOX-TYPE-1	2 X 2	Proposed
18	64630	Straight	BOX-TYPE-1	2 X 2	Proposed
19	64859	-70	BOX-TYPE-1	2 X 2	Proposed
20	65050	125	BOX-TYPE-1	2 X 2	Proposed
21	65340	60	BOX-TYPE-1	2 X 2	Proposed
22	65507	70	BOX-TYPE-1	2 X 2	Proposed
23	65758	Straight	BOX-TYPE-1	2 X 2	Proposed
24	66002	44	BOX-TYPE-1	2 X 2	Proposed
25	66243	150	BOX-TYPE-1	2 X 2	Proposed
26	66465	-60	BOX-TYPE-1	2 X 2	Proposed
27	67024	Straight	BOX-TYPE-1	2 X 2	Proposed
28	67259	125	BOX-TYPE-1	2 X 2	Proposed
29	67353	125	BOX-TYPE-1	2 X 2	Proposed
30	67666	-45	BOX-TYPE-1	2 X 2	Proposed
31	67995	-60	BOX-TYPE-1	2 X 2	Proposed
32	68113	175	BOX-TYPE-1	2 X 2	Proposed
33	68511	Straight	BOX-TYPE-1	2 X 2	Proposed
34	68763	Straight	BOX-TYPE-1	2 X 2	Proposed
35	68990	125	BOX-TYPE-1	2 X 2	Proposed
36	69136	125	BOX-TYPE-1	2 X 2	Proposed
37	69492	-65	BOX-TYPE-1	2 X 2	Proposed
38	69851	60	BOX-TYPE-1	2 X 2	Proposed
39	70351	-688	BOX-TYPE-1	2 X 2	Proposed
40	70860	Straight	BOX-TYPE-1	2 X 2	Proposed
41	71125	30	BOX-TYPE-1	2 X 2	Proposed
42	71375	91	BOX-TYPE-1	2 X 2	Reconstruction
43	71641	30	BOX-TYPE-1	2 X 2	Proposed
44	71860	294	BOX-TYPE-1	2 X 2	Reconstruction

Sr. No.	Chainage (m)	Curve /Straight	Type	Span X Depth	Remarks
45	71928	65	BOX-TYPE-1	2 X 2	Reconstruction
46	72083	-1289	BOX-TYPE-1	2 X 2	Reconstruction
47	72235	75	BOX-TYPE-1	2 X 2	Reconstruction
48	72518	75	BOX-TYPE-1	2 X 2	Proposed
49	72689	75	BOX-TYPE-1	2 X 2	Reconstruction
50	72812	57	BOX-TYPE-1	2 X 2	Reconstruction
51	72973	47	BOX-TYPE-1	2 X 2	Reconstruction
52	73075	102	BOX-TYPE-1	2 X 2	Reconstruction
53	73255	68	BOX-TYPE-1	2 X 2	Reconstruction
54	73487	30	BOX-TYPE-1	2 X 2	Proposed
55	73642	135	BOX-TYPE-1	2 X 2	Reconstruction
56	73832	60	BOX-TYPE-1	2 X 2	Proposed
57	74053	150	BOX-TYPE-1	2 X 2	Proposed
58	74684	Straight	BOX-TYPE-3	4 X 4	Proposed
59	74819	100	BOX-TYPE-1	2 X 2	Proposed

Summary

Total number of culvert **59**

	Description	Nos			Nos
	Box Culvert	**59**	**SPAN in m**	**DEPTH in m**	
	Type -1		**2**	**2**	**58**
	Type -2		**3**	**3**	**0**
	Type -3		**4**	**4**	**1**
	Type -4		**6**	**4**	**0**
	Type -5		**8**	**6**	**0**
	Pipe Culvert	**0**	**Dia**	**Barrel Length**	
	Type -1		**1.2**	**10.0**	**0**
	Type -2		**1.2**	**12.5**	**0**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

COST ESTIMATE PER METER OF RETAINING WALL TYPE-I.

Height of Retaining wall H	=	02.00 m	**Parapets**		
Inclined Base Width B1 = 0.4H+0.6	=	01.40 m	No of parapets	=	5.00
Depth of tranch D=0.1H+0.3	=	0.50 m	Top width of parapet wall	=	0.45 m
Length of wall L	=	10.00 m	Length of parapet	=	01.00 m
Top width of retaining wall	=	0.60 m	Bottom width of parapet wall	=	0.60 m
Horizontal base width B	=	01.36 m	Height of parapet wall	=	0.60 m
Depth of Slope H1	=	0.34 m	Depth of back filling	=	01.16 m

Sl. No	Sor. No	Description of item	No.	Length	Width	Height	Unit	Quantity	Rate (Rs. P)	Amount (Rs. P)
1	3.13	**Excavation for Structures** (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.) I. Ordinary soil								
		A Manual Means (i). upto 3m depth	1	10.30	1.70	1.25	Cum	21.888	357.00	7,814.02
2	12.8-A	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications, placed in foundation and compacted by vibration including curing for 14 days.. I. PCC grade M15								
		Nominal mix 1 : 2 : 4 (hand mixing)	1	10.30	1.70	0.15	Cum	2.627	6,824.00	17,926.65
3	A3	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete.								
		Trapezodial Wall :	1	10.00	0.980	2.00	Cum	19.600		
		Triangular portion :	1	10.00	0.680	0.34	Cum	2.312		
		Parapet :	5	1.00	0.525	0.60	Cum	1.575		
		Total :					Cum	21.912	4,934.00	108,113.81
4	13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification (a) Granular material	1	10.00	0.30	1.16	Cum	3.480	1,251.00	4,353.48

Construction cost = 138,207.96

Sl. No	Sor. No	Description of item	No.	Length	Width	Height	Unit	Quantity	Rate (Rs. P)	Amount (Rs. P)
		Carriage of Materials								
5	1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
		For M15 grade concrete								
		a) Sand		0.450	2.627		Cum	1.182	105.000	124.110
		b) Aggregates		0.90	2.627		Cum	2.364	105.000	248.220
	1.3	c) Cement		0.280	2.627		Ton	0.736	215.000	158.240
		For Plum concrete								
		a) Sand		0.45	21.912		Cum	9.860	105.000	1,035.300
		b) Aggregates		0.36	21.912		Cum	7.888	105.000	828.240
	1.3	c) Cement		0.28	21.912		Ton	6.135	215.000	1,319.025
		d) Masonry stone		0.54	21.912		Cum	11.832	105.000	1,242.360
6	1.4	Haulage of materials by tipper excluding cost of loading, unloading and stacking	**Lead**			**Unit Weight**				
		Case-I : Surfaced road								
		a) Sand		55.00 Kms		1.84	T/Km	20.32	6.70	7487.92
		b) Aggregates		55.00 Kms		1.74	T/km	17.84	6.70	6574.04
		c) Cement		135.00 Kms			T/km	6.87	6.70	6213.92
		d) Masonry stone		5.00 Kms		1.74	T/km	20.59	6.70	689.77
		Case-II : Unsurfaced Gravelled Road								
		a) Sand		2.00 Kms			T/Km	20.32	8.40	341.38
		b) Aggregates		2.00 Kms			T/Km	17.84	8.40	299.71
		c) Cement		0.00 Kms			T/Km	6.87	8.40	0.00
		d) Masonry stone		0.00 Kms			T/Km	20.59	8.40	0.00
								Carriage cost =		**21606.74**
								Cost for 10.00m =		**Rs. 159,814.70**
								Cost per meter =		**Rs. 15,981.47**
								Say =		**Rs. 15,981.00**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

COST ESTIMATE PER METER OF RETAINING WALL TYPE-II.

Height of Retaining wall H	=	03.00 m	**Parapets**				
Inclined Base Width B1 = 0.4H+0.6	=	01.80 m	No of parapets	=	5.00		
Depth of tranch D=0.1H+0.3	=	0.60 m	Top width of parapet wall	=	0.45 m		
Length of wall L	=	10.00 m	Length of parapet	=	01.00 m		
Top width of retaining wall	=	0.60 m	Bottom width of parapet wall	=	0.60 m		
Horizontal base width B	=	01.75 m	Height of parapet wall	=	0.60 m		
Depth of Slope H1	=	0.44 m	Depth of back filling	=	02.06 m		

Sl. No	Sor. No	Description of item	No.	Length	Width	Height	Unit	Quantity	Rate (Rs. P)	Amount (Rs. P)
1	3.13	**Excavation for Structures** (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.) I. Ordinary soil A Manual Means (i). upto 3m depth	1	10.30	2.10	1.80	Cum	38.934	357.00	13,899.44
2	12.8-A	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications, placed in foundation and compacted by vibration including curing for 14 days.. I. PCC grade M15 Nominal mix 1 : 2 : 4 (hand mixing)	1	10.30	2.10	0.15	Cum	3.245	6,824.00	22,143.88
3	A3	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete.								
		Trapezodial Wall :	1	10.00	1.18	3.00	Cum	35.400		
		Triangular portion :	1	10.00	0.875	0.44	Cum	3.850		
		Parapet :	5	1.00	0.53	0.60	Cum	1.590		
		Total :					Cum	39.250	4,934.00	193,659.50
4	13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification (a) Granular material	1	10.00	0.30	2.06	Cum	6.180	1,251.00	7,731.18

Construction cost = 237,434.00

Sl. No	Sor. No	Description of item	No.	Length	Width	Height	Unit	Quantity	Rate (Rs. P)	Amount (Rs. P)
		Carriage of Materials								
5	1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
		For M15 grade concrete								
		a) Sand		0.450	3.245		Cum	1.460	105.000	153.300
		b) Aggregates		0.90	3.245		Cum	2.921	105.000	306.705
		c) Cement		0.280	3.245		Ton	0.909	215.000	195.435
		For Plum concrete								
		a) Sand		0.45	39.250		Cum	17.663	105.000	1,854.615
		b) Aggregates		0.36	39.250		Cum	14.130	105.000	1,483.650
		c) Cement		0.28	39.250		Ton	10.990	215.000	2,362.850
		d) Masonry stone		0.54	39.250		Cum	21.195	105.000	2,225.475
6	1.6	Haulage of materials by tipper excluding cost of loading, unloading and stacking	**Lead**			**Unit Weight**				
		Case-I : Surfaced road								
		a) Sand		55.00 Kms		1.84	T/Km	35.19	6.70	12967.52
		b) Aggregates		55.00 Kms		1.74	T/km	29.67	6.70	10933.40
		c) Cement		135.00 Kms			T/km	11.90	6.70	10763.55
		d) Masonry stone		5.00 Kms		1.74	T/km	36.88	6.70	1235.48
		Case-II : Unsurfaced Gravelled Road								
		a) Sand		2.00 Kms			T/Km	35.19	8.40	591.19
		b) Aggregates		2.00 Kms			T/Km	29.67	8.40	498.46
		c) Cement		0.00 Kms			T/Km	11.90	8.40	0.00
		d) Masonry stone		0.00 Kms			T/Km	36.88	8.40	0.00
								Carriage cost =		**36989.60**

Cost for 10.00m = Rs. 274,423.60

Cost per meter = Rs. 27,442.36

Say = Rs. 27,442.00

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

COST ESTIMATE PER METER OF RETAINING WALL TYPE-III.

Height of Retaining wall H	=	04.00 m	**Parapets**				
Inclined Base Width B1 = 0.4H+0.6	=	02.20 m	No of parapets	=	5.00		
Depth of tranch D=0.1H+0.3	=	0.70 m	Top width of parapet wall	=	0.45 m		
Length of wall L	=	10.00 m	Length of parapet	=	01.00 m		
Top width of retaining wall	=	0.60 m	Bottom width of parapet wall	=	0.60 m		
Horizontal base width B	=	02.13 m	Height of parapet wall	=	0.60 m		
Depth of Slope H1	=	0.53 m	Depth of back filling	=	02.97 m		

Sl. No	Sor. No	Description of item	No.	Length	Width	Height	Unit	Quantity	Rate (Rs. P)	Amount (Rs. P)
1	3.13	**Excavation for Structures** (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.) I. Ordinary soil								
		A Manual Means (i). upto 3m depth	1	10.30	2.50	2.35	Cum	60.513	357.00	21,603.14
2	12.8-A	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications, placed in foundation and compacted by vibration including curing for 14 days.. I. PCC grade M15								
		Nominal mix 1 : 2 : 4 (hand mixing)	1	10.30	2.50	0.15	Cum	3.863	6,824.00	26,361.11
3	A3	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete.								
		Trapezodial Wall :	1	10.00	1.37	4.00	Cum	54.800		
		Triangular portion :	1	10.00	1.065	0.53	Cum	5.645		
		Parapet :	5	1.00	0.53	0.60	Cum	1.590		
		Total :					Cum	60.445	4,934.00	298,235.63
4	13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification (a) Granular material	1	10.00	0.30	2.97	Cum	8.910	1,251.00	11,146.41

Construction cost = 357,346.29

Sl. No	Sor. No	Description of item	No.	Length	Width	Height	Unit	Quantity	Rate (Rs. P)	Amount (Rs. P)
		Carriage of Materials								
5	1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
		For M15 grade concrete								
		a) Sand		0.450	3.863		Cum	1.738	105.000	182.490
		b) Aggregates		0.90	3.863		Cum	3.477	105.000	365.085
		c) Cement		0.280	3.863		Ton	1.082	215.000	232.630
		For Plum concrete								
		a) Sand		0.45	60.445		Cum	27.200	105.000	2,856.000
		b) Aggregates		0.36	60.445		Cum	21.760	105.000	2,284.800
		c) Cement		0.28	60.445		Ton	16.925	215.000	3,638.875
		d) Masonry stone		0.54	60.445		Cum	32.640	105.000	3,427.200
6	1.6	Haulage of materials by tipper excluding cost of loading, unloading and stacking	**Lead**			**Unit Weight**				
		Case-I : Surfaced road								
		a) Sand		55.00 Kms		1.84	T/Km	53.25	6.70	19622.63
		b) Aggregates		55.00 Kms		1.74	T/km	43.91	6.70	16180.84
		c) Cement		135.00 Kms			T/km	18.01	6.70	16290.05
		d) Masonry stone		5.00 Kms		1.74	T/km	56.79	6.70	1902.47
		Case-II : Unsurfaced Gravelled Road								
		a) Sand		2.00 Kms			T/Km	53.25	8.40	894.60
		b) Aggregates		2.00 Kms			T/Km	43.91	8.40	737.69
		c) Cement		0.00 Kms			T/Km	18.01	8.40	0.00
		d) Masonry stone		0.00 Kms			T/Km	56.79	8.40	0.00
									Carriage cost =	**55628.28**

Cost for 10.00m = Rs. 412,974.57

Cost per meter = Rs. 41,297.46

Say = Rs. 41,297.00

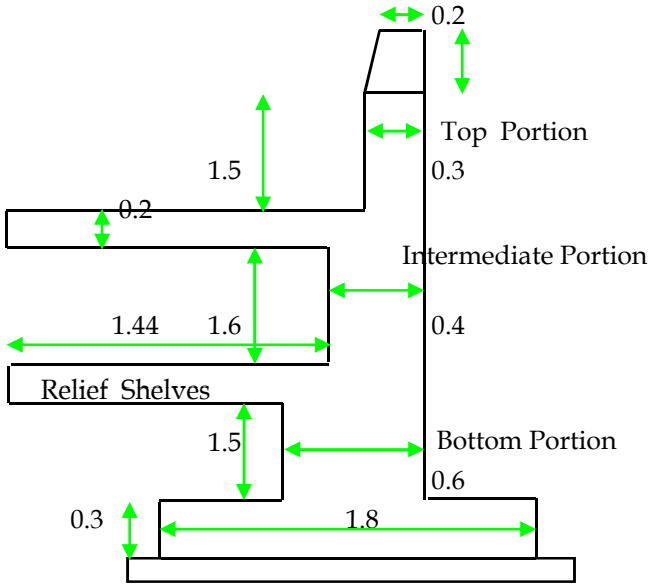
DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

COST ESTIMATE FOR CANTILEVER RETAINING WALL WITH RELIEF SHELVES (TYPE-I)

Length of footing =	1.8	m
Height of footing =	0.3	m
Botton stem thickness =	0.6	m
Height of bottom stem =	1.5	m
Length of Relief Shelves =	1.84	m
Thickness of Relief Shelves =	0.2	m
Nos of Relief Sheves =	2	Nos
Intermediate stem thickness =	0.4	m
Height of Intermediate stem =	1.6	m
Nos of Intermediate stem =	1	Nos
Top stem thickness =	0.3	m
Height of Top stem =	1.5	m
Thickness of Backfilling (Granular Material) =	0.3	m
Height of wall =	**5**	**m**
Length of wall =	10	m



Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
1/3.13	**Excavation for Structures** (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.)								
	I - Ordinary Soil (Manual means) upto 3m depth	cum.	1	10.00	2.60	0.55	14.30	357.00	5105.10
	II - Ordinary rock (not requiring blasting) (Manual means) upto 3m depth	cum.	1	10.00	2.10	0.45	9.45	447.00	4224.15
2/12.8-A	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications (PCC Grade M15)	cum	1	10.00	2.10	0.15	3.15	6824.00	21495.60

Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
3/12.8 -A	Plain/Reinforced cement concrete in substructure complete as per drawing and technical specifications (for Parapet walls) (PCC Grade M15)	cum	5	1.00	0.25	0.45	0.56	6824.00	3821.44
4/12.8 -C	Provide M20 plain cement concrete levelling course in catch pit complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.								
	Footing	cum	1	10.00	1.80	0.30	5.40		
	Botton stem	cum	1	10.00	0.60	1.50	9.00		
	Relief Sheves	cum	2	10.00	1.84	0.20	7.36		
	Intermediate stem	cum	1	10.00	0.40	1.60	6.40		
	Top stem	cum	1	10.00	0.30	1.50	4.50		
	Total	cum					32.66	7782.00	254160.12
5/12.40	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	MT	1				1.80	84490.00	152082.00
6/13.9	Backfilling behind the abutment, wing wall and return walls complete as per drawing and Technical specification(Granular Material)	cum	3	10.00	0.30	1.50	13.50	1251.00	16888.50
								Construction cost =	**457776.91**
	Carriage of Materials								
7/1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
	For M15 grade concrete								
	a) Sand	Cum	0.450	3.710			1.670	105.000	175.350
	b) Aggregates	Cum	0.900	3.710			3.339	105.000	350.595
1.3	c) Cement	Ton	0.280	3.710			1.039	215.000	223.385
	For M20 grade concrete								
	a) Sand	Cum	0.450	32.660			14.697	105.000	1543.185
	b) Aggregates	Cum	0.900	32.660			29.394	105.000	3086.370
1.3	c) Cement	Ton	0.344	32.660			11.235	215.000	2415.525
	d) Steel	Ton	1.050	1.800			1.890	215.000	406.350
	Back filling material	Cum	1.200	13.500			16.200	105.000	1701.000

Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
8/1.4	Cost of Haulage Excluding Loading and Unloading		Lead		Unit Weight				
(i)	Surfaced Road								
	a) Cement	T/Km	135.00	Kms			12.274	6.70	11101.833
	b) Steel	T/Km	135.00	Kms			1.890	6.70	1709.505
	c) Stone Aggregates	T/Km	55.00	Kms	1.74		85.143	6.70	31375.196
	d) Sand	T/Km	55.00	Kms	1.84		30.115	6.70	11097.378
(ii)	Case-II : Unsurfaced Gravelled Road								
	a) Cement	T/Km	0.00	Kms			12.274	8.40	0.00
	b) Steel	T/Km	0.00	Kms			1.890	8.40	0.00
	c) Stone Aggregates	T/Km	2.00	Kms			85.143	8.40	1430.40
	d) Sand	T/Km	2.00	Kms			30.115	8.40	505.93
								Carriage cost =	**57220.24**
								Cost for 10.00m =	***514997.15***
								Cost per meter =	***51499.72***
								Say =	***51500.00***

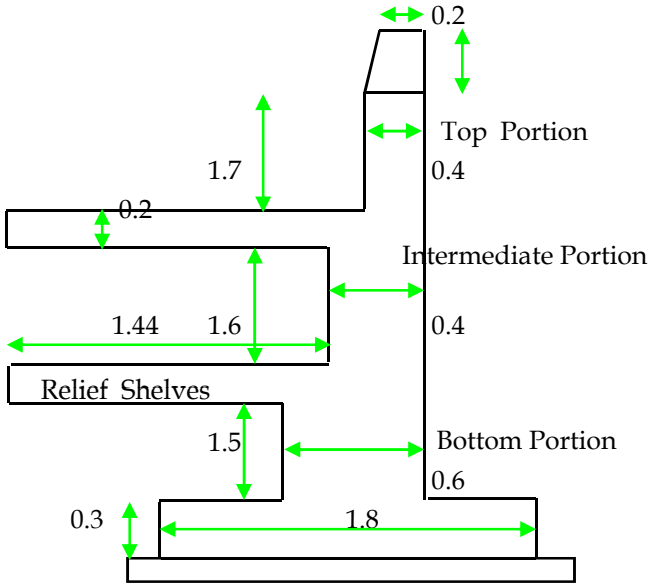
DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

COST ESTIMATE FOR CANTILEVER RETAINING WALL WITH RELIEF SHELVES (TYPE-II)

Length of footing	=	1.80 m
Height of footing	=	0.30 m
Botton stem thickness	=	0.60 m
Height of bottom stem	=	1.50 m
Length of Relief Shelves	=	1.84 m
Thickness of Relief Shelves	=	0.20 m
Nos of Relief Sheves	=	3.00 Nos
Intermediate stem thickness	=	0.40 m
Height of Intermediate stem	=	1.60 m
Nos of Intermediate stem	=	2.00 Nos
Top stem thickness	=	0.40 m
Height of Top stem	=	1.70 m
Thickness of Backfilling (Granular Material)	=	0.30 m
Height of wall	**=**	**7.00 m**
Length of wall	=	10.00 m



Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
1/3.13	**Excavation for Structures** (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.)								
	I - Ordinary Soil (Manual means) upto 3m depth	cum.	1	10.00	2.60	0.55	14.30	357.00	5105.10
	II - Ordinary rock (not requiring blasting) (Manual means) upto 3m depth	cum.	1	10.00	2.10	0.45	9.45	447.00	4224.15
2/12.8-A	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications (PCC Grade M15)	cum	1	10.00	2.10	0.15	3.15	6824.00	21495.60

Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
3/12.8 -A	Plain/Reinforced cement concrete in substructure complete as per drawing and technical specifications (for Parapet walls) (PCC Grade M15)	cum	5	1.00	0.25	0.45	0.56	6824.00	3821.44
4/12.8 -C	Provide M20 plain cement concrete levelling course in catch pit complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.								
	Footing	cum	1	10.00	1.80	0.30	5.40		
	Botton stem	cum	1	10.00	0.60	1.50	9.00		
	Relief Sheves	cum	3	10.00	1.84	0.20	11.04		
	Intermediate stem	cum	2	10.00	0.40	1.60	12.80		
	Top stem	cum	1	10.00	0.30	1.70	5.10		
	Total	cum					43.34	7782.00	337271.88
5/12.40	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	MT	1				2.38	84490.00	201086.20
6/13.9	Backfilling behind the abutment, wing wall and return walls complete as per drawing and Technical specification(Granular Material)	cum	4	10.00	0.30	1.50	18.00	1251.00	22518.00
								Construction cost =	**595522.37**
	Carriage of Materials								
7/1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
	For M15 grade concrete								
	a) Sand	Cum	0.450	3.710			1.670	105.000	175.350
	b) Aggregates	Cum	0.900	3.710			3.339	105.000	350.595
	c) Cement	Ton	0.280	3.710			1.039	215.000	223.385
	For M20 grade concrete								
	a) Sand	Cum	0.450	43.340			19.503	105.000	2047.815
	b) Aggregates	Cum	0.900	43.340			39.006	105.000	4095.630
	c) Cement	Ton	0.344	43.340			14.909	215.000	3205.435
	d) Steel	Ton	1.050	2.380			2.499	215.000	537.285
	Back filling material	Cum	1.200	18.000			21.600	105.000	2268.000

Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
8/1.6	Cost of Haulage Excluding Loading and Unloading		Lead		Unit Weight				
(i)	Surfaced Road								
	a) Cement	T/Km	135.00	Kms			15.948	6.70	14424.966
	b) Steel	T/Km	135.00	Kms			2.499	6.70	2260.346
	c) Stone Aggregates	T/Km	55.00	Kms	1.74		111.264	6.70	41000.784
	d) Sand	T/Km	55.00	Kms	1.84		38.958	6.70	14356.023
(ii)	Case-II : Unsurfaced Gravelled Road								
	a) Cement	T/Km	0.00	Kms			15.948	8.40	0.00
	b) Steel	T/Km	0.00	Kms			2.499	8.40	0.00
	c) Stone Aggregates	T/Km	2.00	Kms			111.264	8.40	1869.24
	d) Sand	T/Km	2.00	Kms			38.958	8.40	654.49

Carriage cost = 74565.85

Cost for 10.00m = *670088.22*

Cost per meter = *67008.82*

Say = *67009.00*

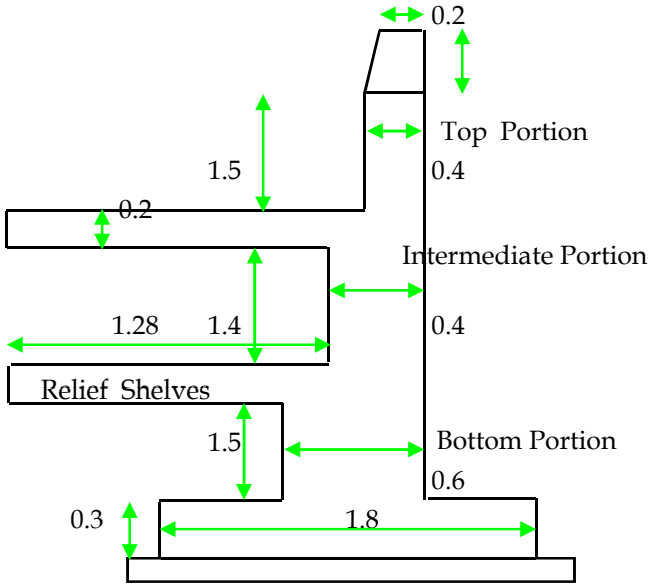
DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

COST ESTIMATE FOR CANTILEVER RETAINING WALL WITH RELIEF SHELVES (TYPE-III)

Length of footing =	1.80	m
Height of footing =	0.30	m
Botton stem thickness =	0.60	m
Height of bottom stem =	1.50	m
Length of Relief Shelves =	1.68	m
Thickness of Relief Shelves =	0.20	m
Nos of Relief Sheves =	4.00	Nos
Intermediate stem thickness =	0.40	m
Height of Intermediate stem =	1.40	m
Nos of Intermediate stem =	3.00	Nos
Top stem thickness =	0.40	m
Height of Top stem =	1.50	m
Thickness of Backfilling (Granular Material) =	0.30	m
Height of wall =	**8.00**	**m**
Length of wall =	10.00	m



Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
1/3.13	**Excavation for Structures** (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.)								
	I - Ordinary Soil (Manual means) upto 3m depth	cum.	1	10.00	2.60	0.55	14.30	357.00	5105.10
	II - Ordinary rock (not requiring blasting) (Manual means) upto 3m depth	cum.	1	10.00	2.10	0.45	9.45	447.00	4224.15
2/12.8-A	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications (PCC Grade M15)	cum	1	10.00	2.10	0.15	3.15	6824.00	21495.60

Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
3/12.8 -A	Plain/Reinforced cement concrete in substructure complete as per drawing and technical specifications (for Parapet walls) (PCC Grade M15)	cum	5	1.00	0.25	0.45	0.56	6824.00	3821.44
4/12.8 -C	Provide M20 plain cement concrete levelling course in catch pit complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.								
	Footing	cum	1	10.00	1.80	0.30	5.40		
	Botton stem	cum	1	10.00	0.60	1.50	9.00		
	Relief Sheves	cum	4	10.00	1.68	0.20	13.44		
	Intermediate stem	cum	3	10.00	0.40	1.40	16.80		
	Top stem	cum	1	10.00	0.30	1.50	4.50		
	Total	cum					49.14	7782.00	382407.48
5/12.40	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	MT	1				2.70	84490.00	228123.00
6/13.9	Backfilling behind the abutment, wing wall and return walls complete as per drawing and Technical specification(Granular Material)	cum	5	10.00	0.30	1.50	22.50	1251.00	28147.50
								Construction cost =	**673324.27**
	Carriage of Materials								
7/1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
	For M15 grade concrete								
	a) Sand	Cum	0.450	3.710			1.670	105.000	175.35
	b) Aggregates	Cum	0.900	3.710			3.339	105.000	350.60
	c) Cement	Ton	0.280	3.710			1.039	215.000	223.39
	For M20 grade concrete								
	a) Sand	Cum	0.450	49.140			22.113	105.000	2321.87
	b) Aggregates	Cum	0.900	49.140			44.226	105.000	4643.73
	c) Cement	Ton	0.344	49.140			16.904	215.000	3634.36
	d) Steel	Ton	1.050	2.700			2.835	215.000	609.53
	Back filling material	Cum	1.200	22.500			27.000	105.000	2835.00

Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
8/1.6	Cost of Haulage Excluding Loading and Unloading		Lead		Unit Weight				
(i)	Surfaced Road								
	a) Cement	T/Km	135.00	Kms			17.943	6.70	16229.44
	b) Steel	T/Km	135.00	Kms			2.835	6.70	2564.26
	c) Stone Aggregates	T/Km	55.00	Kms	1.74		129.743	6.70	47810.30
	d) Sand	T/Km	55.00	Kms	1.84		43.761	6.70	16125.93
(ii)	Case-II : Unsurfaced Gravelled Road								
	a) Cement	T/Km	0.00	Kms			17.943	8.40	0.00
	b) Steel	T/Km	0.00	Kms			2.835	8.40	0.00
	c) Stone Aggregates	T/Km	2.00	Kms			129.743	8.40	2179.68
	d) Sand	T/Km	2.00	Kms			43.761	8.40	735.18

Carriage cost = 85644.79

Cost for 10.00m = *758969.06*

Cost per meter = *75896.91*

Say = *75897.00*

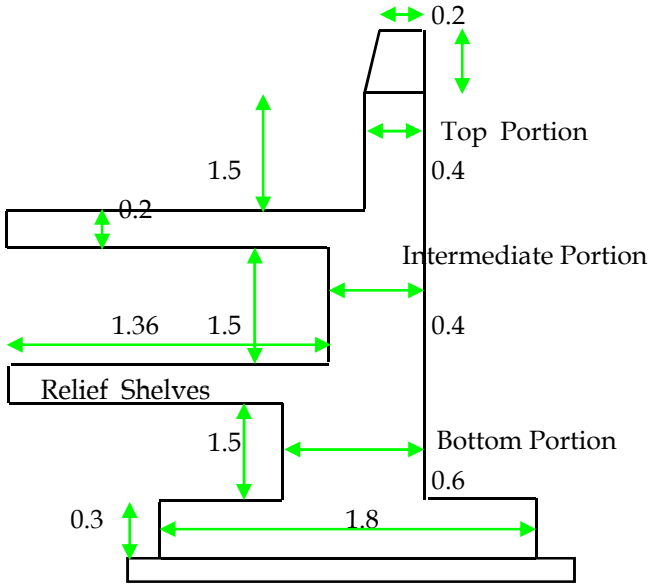
DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

COST ESTIMATE FOR CANTILEVER RETAINING WALL WITH RELIEF SHELVES (TYPE-IV)

Length of footing	=	1.80 m
Height of footing	=	0.30 m
Botton stem thickness	=	0.60 m
Height of bottom stem	=	1.50 m
Length of Relief Shelves	=	1.76 m
Thickness of Relief Shelves	=	0.20 m
Nos of Relief Sheves	=	5.00 Nos
Intermediate stem thickness	=	0.40 m
Height of Intermediate stem	=	1.50 m
Nos of Intermediate stem	=	4.00 Nos
Top stem thickness	=	0.40 m
Height of Top stem	=	1.50 m
Thickness of Backfilling (Granular Material)	=	0.30 m
Height of wall	**=**	**10.00 m**
Length of wall	=	10.00 m



Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
1/3.13	**Excavation for Structures** (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.)								
	I - Ordinary Soil (Manual means) upto 3m depth	cum.	1	10.00	2.60	0.55	14.30	357.00	5105.10
	II - Ordinary rock (not requiring blasting) (Manual means) upto 3m depth	cum.	1	10.00	2.10	0.45	9.45	447.00	4224.15
2/12.8-A	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications (PCC Grade M15)	cum	1	10.00	2.10	0.15	3.15	6824.00	21495.60

Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
3/12.8 -A	Plain/Reinforced cement concrete in substructure complete as per drawing and technical specifications (for Parapet walls) (PCC Grade M15)	cum	5	1.00	0.25	0.45	0.56	6824.00	3821.44
4/12.8 -C	Provide M20 plain cement concrete levelling course in catch pit complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.								
	Footing	cum	1	10.00	1.80	0.30	5.40		
	Botton stem	cum	1	10.00	0.60	1.50	9.00		
	Relief Sheves	cum	5	10.00	1.76	0.20	17.60		
	Intermediate stem	cum	4	10.00	0.40	1.50	24.00		
	Top stem	cum	1	10.00	0.30	1.50	4.50		
	Total	cum					60.50	7782.00	470811.00
5/12.40	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	MT	1				3.33	84490.00	281351.70
6/13.9	Backfilling behind the abutment, wing wall and return walls complete as per drawing and Technical specification(Granular Material)	cum	6	10.00	0.30	1.50	27.00	1251.00	33777.00
								Construction cost =	**820585.99**
	Carriage of Materials								
7/1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
	For M15 grade concrete								
	a) Sand	Cum	0.450	3.710			1.670	105.000	175.350
	b) Aggregates	Cum	0.900	3.710			3.339	105.000	350.595
	c) Cement	Ton	0.280	3.710			1.039	215.000	223.385
	For M20 grade concrete								
	a) Sand	Cum	0.450	60.500			27.225	105.000	2858.625
	b) Aggregates	Cum	0.900	60.500			54.450	105.000	5717.250
	c) Cement	Ton	0.344	60.500			20.812	215.000	4474.580
	d) Steel	Ton	1.050	3.330			3.497	215.000	751.855
	Back filling material	Cum	1.200	27.000			32.400	105.000	3402.000

Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
8/1.6	Cost of Haulage Excluding Loading and Unloading		Lead		Unit Weight				
(i)	Surfaced Road								
	a) Cement	T/Km	135.00	Kms			21.851	6.70	19764.23
	b) Steel	T/Km	135.00	Kms			3.497	6.70	3163.04
	c) Stone Aggregates	T/Km	55.00	Kms	1.74		156.929	6.70	57828.34
	d) Sand	T/Km	55.00	Kms	1.84		53.167	6.70	19592.04
(ii)	Case-II : Unsurfaced Gravelled Road								
	a) Cement	T/Km	0.00	Kms			21.851	8.40	0
	b) Steel	T/Km	0.00	Kms			3.497	8.40	0
	c) Stone Aggregates	T/Km	2.00	Kms			156.929	8.40	2636.4072
	d) Sand	T/Km	2.00	Kms			53.167	8.40	893.2056
								Carriage cost =	**103877.26**
								Cost for 10.00m =	***924463.25***
								Cost per meter =	***92446.33***
								Say =	***92447.00***

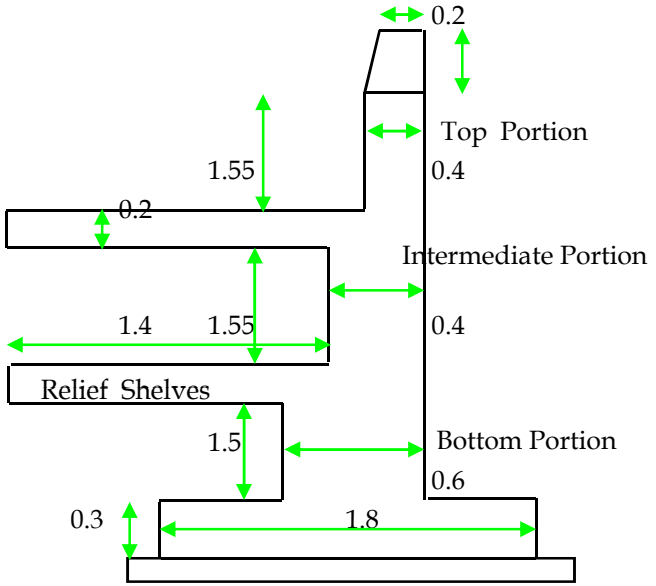
DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

COST ESTIMATE FOR CANTILEVER RETAINING WALL WITH RELIEF SHELVES (TYPE-V)

Length of footing	=	1.80 m
Height of footing	=	0.30 m
Botton stem thickness	=	0.60 m
Height of bottom stem	=	1.50 m
Length of Relief Shelves	=	1.80 m
Thickness of Relief Shelves	=	0.20 m
Nos of Relief Sheves	=	6.00 Nos
Intermediate stem thickness	=	0.40 m
Height of Intermediate stem	=	1.55 m
Nos of Intermediate stem	=	5.00 Nos
Top stem thickness	=	0.40 m
Height of Top stem	=	1.55 m
Thickness of Backfilling (Granular Material)	=	0.30 m
Height of wall	**=**	**12.00 m**
Length of wall	=	10.00 m



Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
1/3.13	**Excavation for Structures** (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.)								
	I - Ordinary Soil (Manual means) upto 3m depth	cum.	1	10.00	2.60	0.55	14.30	357.00	5105.10
	II - Ordinary rock (not requiring blasting) (Manual means) upto 3m depth	cum.	1	10.00	2.10	0.45	9.45	447.00	4224.15
2/12.8-A	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications (PCC Grade M15)	cum	1	10.00	2.10	0.15	3.15	6824.00	21495.60

Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
3/12.8 -A	Plain/Reinforced cement concrete in substructure complete as per drawing and technical specifications (for Parapet walls) (PCC Grade M15)	cum	5	1.00	0.25	0.45	0.56	6824.00	3821.44
4/12.8 -C	Provide M20 plain cement concrete levelling course in catch pit complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.								
	Footing	cum	1	10.00	1.80	0.30	5.40		
	Botton stem	cum	1	10.00	0.60	1.50	9.00		
	Relief Sheves	cum	6	10.00	1.80	0.20	21.60		
	Intermediate stem	cum	5	10.00	0.40	1.55	31.00		
	Top stem	cum	1	10.00	0.30	1.55	4.65		
	Total	cum					71.65	7782.00	557580.30
5/12.40	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	MT	1				3.94	84490.00	332890.60
6/13.9	Backfilling behind the abutment, wing wall and return walls complete as per drawing and Technical specification(Granular Material)	cum	7	10.00	0.30	1.50	31.50	1251.00	39406.50
								Construction cost =	**964523.69**
	Carriage of Materials								
7/1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
	For M15 grade concrete								
	a) Sand	Cum	0.450	3.710			1.670	105.000	175.350
	b) Aggregates	Cum	0.900	3.710			3.339	105.000	350.595
	c) Cement	Ton	0.280	3.710			1.039	215.000	223.385
	For M20 grade concrete								
	a) Sand	Cum	0.450	71.650			32.243	105.000	3385.515
	b) Aggregates	Cum	0.900	71.650			64.485	105.000	6770.925
	c) Cement	Ton	0.344	71.650			24.648	215.000	5299.320
	d) Steel	Ton	1.050	3.940			4.137	215.000	889.455
	Back filling material	Cum	1.200	31.500			37.800	105.000	3969.000

Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
8/1.6	Cost of Haulage Excluding Loading and Unloading		Lead		Unit Weight				
(i)	Surfaced Road								
	a) Cement	T/Km	135.00	Kms			25.687	6.70	23233.892
	b) Steel	T/Km	135.00	Kms			4.137	6.70	3741.917
	c) Stone Aggregates	T/Km	55.00	Kms	1.74		183.786	6.70	67725.141
	d) Sand	T/Km	55.00	Kms	1.84		62.400	6.70	22994.400
(ii)	Case-II : Unsurfaced Gravelled Road								
	a) Cement	T/Km	0.00	Kms			25.687	8.40	0
	b) Steel	T/Km	0.00	Kms			4.137	8.40	0
	c) Stone Aggregates	T/Km	2.00	Kms			183.786	8.40	3087.6048
	d) Sand	T/Km	2.00	Kms			62.400	8.40	1048.32

Carriage cost = **121831.27**

Cost for 10.00m = ***1086354.96***

Cost per meter = ***108635.50***

Say = ***108636.00***

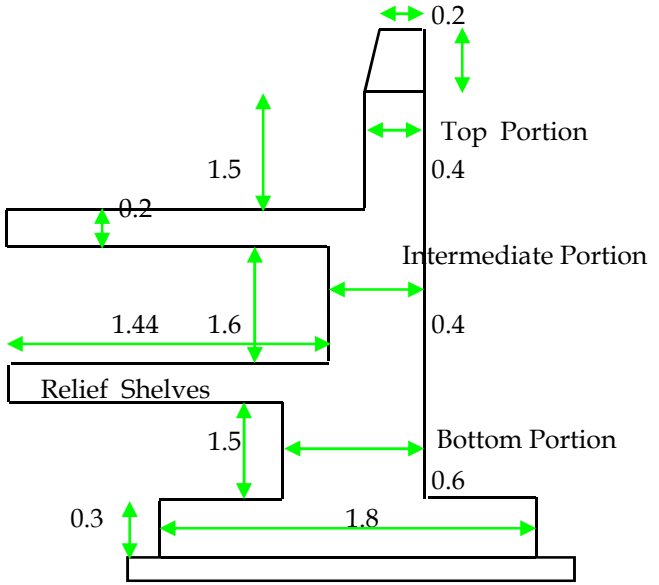
DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

COST ESTIMATE FOR CANTILEVER RETAINING WALL WITH RELIEF SHELVES (TYPE-VI)

Length of footing =	1.80	m
Height of footing =	0.30	m
Botton stem thickness =	0.60	m
Height of bottom stem =	1.50	m
Length of Relief Shelves =	1.84	m
Thickness of Relief Shelves =	0.20	m
Nos of Relief Sheves =	7.00	Nos
Intermediate stem thickness =	0.40	m
Height of Intermediate stem =	1.60	m
Nos of Intermediate stem =	6.00	Nos
Top stem thickness =	0.40	m
Height of Top stem =	1.50	m
Thickness of Backfilling (Granular Material) =	0.30	m
Height of wall =	**14.00**	**m**
Length of wall =	10.00	m



Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
1/3.13	**Excavation for Structures** (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.)								
	I - Ordinary Soil (Manual means) upto 3m depth	cum.	1	10.00	2.60	0.55	14.30	357.00	5105.10
	II - Ordinary rock (not requiring blasting) (Manual means) upto 3m depth	cum.	1	10.00	2.10	0.45	9.45	447.00	4224.15
2/12.8-A	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications (PCC Grade M15)	cum	1	10.00	2.10	0.15	3.15	6824.00	21495.60

Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
3/12.8 -A	Plain/Reinforced cement concrete in substructure complete as per drawing and technical specifications (for Parapet walls) (PCC Grade M15)	cum	5	1.00	0.25	0.45	0.56	6824.00	3821.44
4/12.8 -C	Provide M20 plain cement concrete levelling course in catch pit complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.								
	Footing	cum	1	10.00	1.80	0.30	5.40		
	Botton stem	cum	1	10.00	0.60	1.50	9.00		
	Relief Sheves	cum	7	10.00	1.84	0.20	25.76		
	Intermediate stem	cum	6	10.00	0.40	1.60	38.40		
	Top stem	cum	1	10.00	0.30	1.50	4.50		
	Total	cum					83.06	7782.00	646372.92
5/12.40	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	MT	1				4.57	84490.00	386119.30
6/13.9	Backfilling behind the abutment, wing wall and return walls complete as per drawing and Technical specification(Granular Material)	cum	8	10.00	0.30	1.50	36.00	1251.00	45036.00
								Construction cost =	**1112174.51**
	Carriage of Materials								
7/1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
	For M15 grade concrete								
	a) Sand	Cum	0.450	3.710			1.670	105.000	175.350
	b) Aggregates	Cum	0.900	3.710			3.339	105.000	350.595
	c) Cement	Ton	0.280	3.710			1.039	215.000	223.385
	For M20 grade concrete								
	a) Sand	Cum	0.450	83.060			37.377	105.000	3924.585
	b) Aggregates	Cum	0.900	83.060			74.754	105.000	7849.170
	c) Cement	Ton	0.344	83.060			28.573	215.000	6143.195
	d) Steel	Ton	1.050	4.570			4.799	215.000	1031.785
	Back filling material	Cum	1.200	36.000			43.200	105.000	4536.000

Item No.	Items of Work	Unit	Nos	Length	Width	Height	Quantity	Unit Rate (Rs.)	Amount (Rs.)
8/1.6	Cost of Haulage Excluding Loading and Unloading		Lead		Unit Weight				
(i)	Surfaced Road								
	a) Cement	T/Km	135.00	Kms			29.612	6.70	26784.054
	b) Steel	T/Km	135.00	Kms			4.799	6.70	4340.696
	c) Stone Aggregates	T/Km	55.00	Kms	1.74		211.050	6.70	77771.925
	d) Sand	T/Km	55.00	Kms	1.84		71.846	6.70	26475.251
(ii)	Case-II : Unsurfaced Gravelled Road								
	a) Cement	T/Km	0.00	Kms			29.612	8.40	0
	b) Steel	T/Km	0.00	Kms			4.799	8.40	0
	c) Stone Aggregates	T/Km	2.00	Kms			211.050	8.40	3545.64
	d) Sand	T/Km	2.00	Kms			71.846	8.40	1207.0128

Carriage cost = 140124.58

Cost for 10.00m = *1252299.09*

Cost per meter = *125229.91*

Say = *125230.00*

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

COST ESTIMATE PER METER OF BREAST WALL TYPE-I.

Height of Breast wall H	=	02.00 m	Top width of retaining wall	=	0.60 m
Inclined Base Width B1 = 0.4H+0.3	=	01.10 m	Horizontal base width B	=	01.04 m
Depth of tranch D=0.1H+0.3	=	0.50 m	Depth of Slope H1	=	0.35 m
Length of wall L	=	10.00 m	Depth of back filling	=	01.35 m

Sl. No	Sor. No	Description of item	No.	Length	Width	Height	Unit	Quantity	Rate (Rs. P)	Amount (Rs. P)
1	3.13	**Excavation for Structures** (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.) I. Ordinary soil A Manual Means (i). upto 3m depth	1	10.30	1.40	1.25	Cum	18.025	357.00	6,434.93
2	12.8-A	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications, placed in foundation and compacted by vibration including curing for 14 days.. I. PCC grade M15 Nominal mix 1 : 2 : 4 (hand mixing)	1	10.30	1.40	0.15	Cum	2.163	6,824.00	14,760.31
3	A3	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete.								
		Trapezodial Wall :	1	10.00	0.82	2.00	Cum	16.400		
		Triangular portion :	1	10.00	0.520	0.35	Cum	1.820		
		Total :					Cum	18.220	4,934.00	89,897.48
4	13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification (a) Granular material	1	10.00	0.30	1.35	Cum	4.050	1,251.00	5,066.55
								Construction cost =		**116,159.27**

Sl. No	Sor. No	Description of item	No.	Length	Width	Height	Unit	Quantity	Rate (Rs. P)	Amount (Rs. P)
		Carriage of Materials								
5	1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
		For M15 grade concrete								
		a) Sand		0.450	2.163		Cum	0.973	105.000	102.165
		b) Aggregates		0.90	2.163		Cum	1.947	105.000	204.435
	1.3	c) Cement		0.280	2.163		Ton	0.606	215.000	130.290
		For Plum concrete								
		a) Sand		0.45	18.220		Cum	8.199	105.000	860.895
		b) Aggregates		0.36	18.220		Cum	6.559	105.000	688.695
	1.3	c) Cement		0.28	18.220		Ton	5.102	215.000	1,096.930
		d) Masonry stone		0.54	18.220		Cum	9.839	105.000	1,033.095
6	1.6	Haulage of materials by tipper excluding cost of loading, unloading and stacking		**Lead**		**Unit Weight**				
		Case-I : Surfaced road		Lead						
		a) Sand		55.00 Kms		1.84	T/Km	16.88	6.70	6220.28
		b) Aggregates		55.00 Kms		1.74	T/Km	14.80	6.70	5453.80
		c) Cement		135.00 Kms			T/Km	5.71	6.70	5164.70
		d) Masonry stone		5.00 Kms		1.74	T/Km	17.12	6.70	573.52
		Case-II : Unsurfaced Gravelled Road								
		a) Sand		2.00 Kms			T/Km	16.88	8.40	283.58
		b) Aggregates		2.00 Kms			T/Km	14.80	8.40	248.64
		c) Cement		0.00 Kms			T/Km	5.71	8.40	0.00
		d) Masonry stone		0.00 Kms			T/Km	17.12	8.40	0.00
									Carriage cost =	**20074.55**
									Cost for 10.00m =	**Rs. 136,234**
									Cost per meter =	**Rs. 13,623**
									Say =	**Rs. 13,623**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

COST ESTIMATE PER METER OF BREAST WALL TYPE-II.

Height of Breast wall H	=	03.00 m	Top width of retaining wall	=	0.60 m
Inclined Base Width B1 = 0.4H+0.3	=	01.50 m	Horizontal base width B	=	01.42 m
Depth of tranch D=0.1H+0.3	=	0.60 m	Depth of Slope H1	=	0.47 m
Length of wall L	=	10.00 m	Depth of back filling	=	02.23 m

Sl. No	Sor. No	Description of item	No.	Length	Width	Height	Unit	Quantity	Rate (Rs. P)	Amount (Rs. P)
1	3.13	**Excavation for Structures** (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.) I. Ordinary soil A Manual Means (i). upto 3m depth	1	10.30	1.80	1.80	Cum	33.372	357.00	11,913.80
2	12.8-A	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications, placed in foundation and compacted by vibration including curing for 14 days.. I. PCC grade M15 Nominal mix 1 : 2 : 4 (hand mixing)	1	10.30	1.80	0.15	Cum	2.781	6,824.00	18,977.54
3	A3	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete. Trapezodial Wall : Triangular portion : Total :	1 1	10.00 10.00	1.01 0.710	3.00 0.47	Cum Cum Cum	30.300 3.337 33.637	 4,934.00	 165,964.96
4	13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification (a) Granular material	1	10.00	0.30	2.23	Cum	6.690	1,251.00	8,369.19
								Construction cost =		**205,225.49**

Sl. No	Sor. No	Description of item	No.	Length	Width	Height	Unit	Quantity	Rate (Rs. P)	Amount (Rs. P)
		Carriage of Materials								
5	1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
		For M15 grade concrete								
		a) Sand		0.450	2.781		Cum	1.251	105.000	131.355
		b) Aggregates		0.90	2.781		Cum	2.503	105.000	262.815
		c) Cement		0.280	2.781		Ton	0.779	215.000	167.485
		For Plum concrete								
		a) Sand		0.45	33.637		Cum	15.137	105.000	1,589.385
		b) Aggregates		0.36	33.637		Cum	12.109	105.000	1,271.445
		c) Cement		0.28	33.637		Ton	9.418	215.000	2,024.870
		d) Masonry stone		0.54	33.637		Cum	18.164	105.000	1,907.220
6	1.6	Haulage of materials by tipper excluding cost of loading, unloading and stacking	**Lead**			**Unit Weight**				
		Case-I : Surfaced road		Lead						
		a) Sand		55.00 Kms		1.84	T/Km	30.15	6.70	11110.28
		b) Aggregates		55.00 Kms		1.74	T/Km	25.42	6.70	9367.27
		c) Cement		135.00 Kms			T/Km	10.20	6.70	9225.90
		d) Masonry stone		5.00 Kms		1.74	T/Km	31.61	6.70	1058.94
		Case-II : Unsurfaced Gravelled Road								
		a) Sand		2.00 Kms			T/Km	30.15	8.40	506.52
		b) Aggregates		2.00 Kms			T/Km	25.42	8.40	427.06
		c) Cement		0.00 Kms			T/Km	10.20	8.40	0.00
		d) Masonry stone		0.00 Kms			T/Km	31.61	8.40	0.00
									Carriage cost =	**35628.06**
									Cost for 10.00m =	**Rs. 240,854**
									Cost per meter =	**Rs. 24,085**
									Say =	**Rs. 24,085**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

COST ESTIMATE PER METER OF GABION WALL TYPE-I.

Height of Retaining wall H	=	2.0 m	Depth of tranch D	=	.30 m
Base Width B	=	2.0 m	Length of wall L	=	10.0 m
Top Width T	=	1.0 m	Depth of Gabion box	=	1.0 m

Sr.No	Ref to SOR No.	Description	Unit	Nos	Length	Width	Depth	Quantity	Rate in Rs	Amount in Rs
1	3.13	**Excavation for Structures** (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.) I. Ordinary soil								
		A Manual Means (i). upto 3m depth	Cum	1	10	2	0.65	13.0	357.00	4641
2	15.12	**Gabian Structure for Retaining Earth** (Providing and construction of a gabain 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 10sqm 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								
		Bottom layer	Cum	1	10	2.0 m	1.0 m	20.0		
		Top layer	Cum	1	10	1.0 m	1.0 m	10.0		
		Total quantity	Cum					**30.00**	3035.00	91050.00
3		***Carriage of Materials***								
	1.1	Loading and unloading of stone boulder	Cum					30.00	105.00	3150.00
	1.6	Cost of Haulage Excluding Loading and Unloading								
	(ii)	Case-II : Unsurfaced Gravelled Road								
		b) Stone boulder	ton. km	0			1.74	52.20	8.40	0.00

Total cost for 10Rm 0f Gabion Wall 2.00m high = 98841

Therefore,Rate per Rm = 9884.1

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

COST ESTIMATE PER METER OF GABION WALL TYPE-II.

Height of Retaining wall H	=	3.00 m	Depth of tranch D	=	.30 m
Base Width B	=	3.00 m	Length of wall L	=	10.0 m
Top Width T	=	1.0 m	Depth of Gabion box	=	1.0 m

Sr. No	Ref to SOR No.	Description	Unit	Nos	Length	Width	Depth	Quantity	Rate in Rs	Amount in Rs
1	3.13	**Excavation for Structures** (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.) I. Ordinary soil								
		A Manual Means (i). upto 3m depth	Cum	1.00	10.00	3.00	0.9	27.00	357.00	9639.00
2	15.12	Gabian Structure for Retaining Earth (Providing and construction of a gabain 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 10sqm 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								
		Bottom layer	Cum	1.00	10.00	3.00	1.00	30.00		
		Middle layer	Cum	1.00	10.00	2.00	1.00	20.00		
		Top layer	Cum	1.00	10.00	1.00	1.00	10.00		
		Total quantity =	Cum					60.00	3035.00	182100.00
3		***Carriage of Materials***								
	1.1	Loading and unloading of stone boulder	Cum					60.00	105.00	6300.00
	1.4	Cost of Haulage Excluding Loading and Unloading								
	(iii)	Case-II : Unsurfaced Gravelled Road								
		b) Stone boulder	ton. km	0.00			1.74	104.40	8.40	0.00
									Total cost for 10Rm 0f Gabion Wall 3.0m high =	**198039.00**
									Therefore,Rate per Rm =	**19803.90**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

COST ESTIMATE PER METER OF TOE WALL TYPE -I

Height of Toe wall H	2.0 m	Top width of Toe wall	=	0.60 m
Inclined Base Width B1 = 0.4H+0.3	1.1 m	Horizontal base width B	=	1.07 m
Depth of tranch D=0.1H+0.3	0.5 m	Depth of tranch H1	=	0.27 m
Length of wall L	10.0 m	Depth of back filling	=	1.00 m

Sr.No	Ref to SOR No.	Description	Unit	Nos	Length	Width	Depth	Quantity	Rate in Rs	Amount in Rs
1	3.13	**Excavation for Structures** (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.) I. Ordinary soil A Manual Means (i). upto 3m depth	Cum	1	10.00	1.40	0.75	10.5	357.00	3748.50
2	12.8 **A**	Plain/Reinforced cement concrete in open foundation as per drawing and technical specifications . **PCC Grade M15**	Cum	1	10.00	1.40	0.15	2.10	6,824.00	14330.40
3	A3	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete. Trapezoidal Portion : Triangular portion : Total :	Cum Cum Cum	1 1	10.00 10.00	0.84 0.54	2.000 0.270	16.800 1.458 18.258	4,934.00	90084.97
4	13.09 **A**	Backfilling behind the abutment, wing wall and return walls complete as per drawing and Technical specification **Granular Material**	Cum	1	10.00	0.30	1.00	3.000	1,251.00	3753.00

Construction cost = 111916.87

Sr.No	Ref to SOR No.	Description	Unit	Nos	Length	Width	Depth	Quantity	Rate in Rs	Amount in Rs
		Carriage of Materials								
5	1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
		For M15 grade concrete								
		a) Sand		0.450	2.100		Cum	0.945	105.000	99.225
		b) Aggregates		0.90	2.100		Cum	1.890	105.000	198.450
		c) Cement		0.280	2.100		Ton	0.588	215.000	126.420
		For Plum concrete								
		a) Sand		0.45	18.258		Cum	8.216	105.000	862.680
		b) Aggregates		0.36	18.258		Cum	6.573	105.000	690.165
		c) Cement		0.28	18.258		Ton	5.112	215.000	1,099.080
		d) Masonry stone		0.54	18.258		Cum	9.859	105.000	1,035.195
6	1.6	Cost of Haulage Excluding Loading and Unloading	**Lead**			**Unit Weight**				
	(i)	Surfaced Road								
		a) Sand		55.00 Kms		1.84	T/Km	16.856	6.70	6211.44
		b) Aggregates		55.00 Kms		1.74	T/Km	14.726	6.70	5426.53
		c) Cement		135.0 Kms			T/Km	5.700	6.70	5155.65
		d) Masonry stone		5.00 Kms		1.74	T/Km	17.155	6.70	574.69
	(ii)	Case-II : Unsurfaced Gravelled Road								
		a) Sand		2.00 Kms			T/Km	16.86	8.40	283.25
		b) Aggregates		2.00 Kms			T/Km	14.73	8.40	247.46
		c) Cement		0.00 Kms			T/Km	5.70	8.40	0.00
		d) Masonry stone		0.00 Kms			T/Km	17.16	8.40	0.00
									Carriage cost =	**22010.24**
									Cost for 10.00m =	**133927.11**
									Cost per meter =	**13392.71**
									Say =	**13393.00**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

COST ESTIMATE PER METER OF TOE WALL TYPE -II

Height of Toe wall H	3.0 m	Top width of Toe wall	=	0.60 m
Inclined Base Width B1 = 0.4H+0.3	1.5 m	Horizontal base width B	=	1.46 m
Depth of tranch D=0.1H+0.3	0.6 m	Depth of tranch H1	=	0.36 m
Length of wall L	10.0 m	Depth of back filling	=	1.90 m

Sr.No	Ref to SOR No.	Description	Unit	Nos	Length	Width	Depth	Quantity	Rate in Rs	Amount in Rs
1	3.11	**Excavation for Structures** (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.) I. Ordinary soil A Manual Means (i). upto 3m depth	Cum	1	10.00	1.80	1.05	18.9	357.00	6747.30
2	12.8 **A**	Plain/Reinforced cement concrete in open foundation as per drawing and technical specifications . **PCC Grade M15**	Cum	1	10.00	1.80	0.15	2.70	6,824.00	18424.80
3	A3	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete.								
		Trapezoidal Portion :	Cum	1	10.00	1.03	3.000	30.900		
		Triangular portion :	Cum	1	10.00	0.73	0.360	2.628		
		Total :	Cum					33.528	4,934.00	165427.15
4	13.09	Backfilling behind the abutment, wing wall and return walls complete as per drawing and Technical specification								
	A	**Granular Material**	Cum	1	10.00	0.30	1.90	5.700	1,251.00	7130.70

Construction cost = 197729.95

Sr.No	Ref to SOR No.	Description	Unit	Nos	Length	Width	Depth	Quantity	Rate in Rs	Amount in Rs
		Carriage of Materials								
5	1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
		For M15 grade concrete								
		a) Sand		0.450	2.700		Cum	1.215	105.000	127.575
		b) Aggregates		0.90	2.700		Cum	2.430	105.000	255.150
		c) Cement		0.280	2.700		Ton	0.756	215.000	162.540
		For Plum concrete								
		a) Sand		0.45	33.528		Cum	15.088	105.000	1,584.240
		b) Aggregates		0.36	33.528		Cum	12.070	105.000	1,267.350
		c) Cement		0.28	33.528		Ton	9.388	215.000	2,018.420
		d) Masonry stone		0.54	33.528		Cum	18.105	105.000	1,901.025
6	1.6	Cost of Haulage Excluding Loading and Unloading	**Lead**			**Unit Weight**				
	(i)	Surfaced Road								
		a) Sand		55.00 Kms		1.84	T/Km	29.998	6.70	11054.26
		b) Aggregates		55.00 Kms		1.74	T/Km	25.230	6.70	9297.26
		c) Cement		135.0 Kms			T/Km	10.144	6.70	9175.25
		d) Masonry stone		5.00 Kms		1.74	T/Km	31.503	6.70	1055.35
	(ii)	Case-II : Unsurfaced Gravelled Road								
		a) Sand		2.00 Kms			T/Km	30.00	8.40	504.00
		b) Aggregates		2.00 Kms			T/Km	25.23	8.40	423.86
		c) Cement		0.00 Kms			T/Km	10.14	8.40	0.00
		d) Masonry stone		0.00 Kms			T/Km	31.50	8.40	0.00
									Carriage cost =	**38826.28**
									Cost for 10.00m =	**236556.23**
									Cost per meter =	**23655.62**
									Say =	**23656.00**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

COST ESTIMATE FOR RCC BOX CULVERT TYPE-I

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Catch pit size Width X Length	1.80 m	x	2.60 m					
Catch pit wall thickness	0.30 m		Top width of wall			=		0.600 m
Height of Upstream wall	4.23 m	Bottom Width	=	2.292 m	Length	=		4.600 m
Height of Downstream wall	5.63 m	Bottom Width	=	2.852 m	Length	=		8.600 m
Width of U/S head wall at box bottom level	=	2.09 m	Width of D/S head wall at box bottom			=		2.592 m
Width of U/S head wall at box top level	=	0.98 m	Width of D/S head wall at box top leve			=		1.480 m
Length of wing wall U/S	=	1.00 m	Length of wing wall D/S			=		1.000 m
Span	**=**	**2.00 m**	Wall thinkness " f "			=		0.300 m
Depth	**=**	**2.00 m**	Bottom slab offset " c "			=		0.500 m
Barrel length	**=**	**10.00 m**	Bottom slab thickness " e "			=		0.380 m
Top slab thickness " d "	=	0.40 m	PCC thickness			=		0.150 m

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
1	3.13	**Excavation for Structures** (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.)								
		Up stream head wall	Cum	1	4.75	2.44	4.38	50.764		
		Down stream head wall	Cum	1	8.75	3.00	2.97	77.963		
		Culvert beding	Cum	1	5.32	3.90	3.68	76.353		
		Catch pit	Cum	1	2.75	1.88	3.64	18.819		
		Apron	Cum	1	4.50	3.20	0.30	4.320		
		Total	Cum					228.219		
	I	Ordinary Soil A.Manual means (i) upto 3m depth	Cum	70%				159.753	357.00	57031.82
	II	Ordinary rock (not requiring blasting) A.Manual means (i) upto 3m depth	Cum	30%				68.466	447.00	30604.30
2	12.8-A	Provide M15 plain cement concrete levelling course below box bedding ,wingwalls, catch pits, cross drains etc. complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.								
		Up stream head wall footing	Cum	1	4.75	2.44	0.15	1.739		
		Down stream head wall footing	Cum	1	8.75	3	0.15	3.938		
		Box Bedding	Cum	1	5.32	3.9	0.15	3.112		
		Catch pit	Cum	1	2.75	2.03	0.15	0.837		
		Total	Cum					9.626	6824.00	65687.82

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
3	12.8-B	Provide M20 plain cement concrete levelling course in catch pit complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.	Cum	1	2.600	1.800	0.075	0.35	7782.00	2723.70
4	12.8-E	Plain/Reinforced cement concrete M25 in sub-structure complete as per drawing and technical specifications								
		base slab	Cum	1	10.00	3.6	0.380	13.680		
		side wall	Cum	2	10.00	0.3	2.00	12.000		
		top slab	Cum	1	10.00	2.6	0.400	10.400		
		Hunch	Cum	4	10.00	0.15	0.15	0.450		
		Wing wall	Cum	4	1.00	0.3	2.40	1.440		
		Total	Cum					37.970	8499.00	322707.03
5	12.40	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications								
		80 kg/Cum	MT	1.00				3.04	84490.00	256849.60
6	A	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete.								
		Up stream head wall	Cum	1	4.60	1.45	4.23	14.107		
		Down stream head wall	Cum	1	8.60	1.73	5.63	41.882		
		Deduction of box portion in U/S H/W	Cum	-1	4.60	1.54	2.78	-9.847		
		Deduction of box portion in D/S H/W	Cum	-1	4.60	2.04	2.78	-13.044		
		Parapet Wall	Cum	3	2.00	0.60	0.45	0.810		
		Catch pit Long wall	Cum	2	2.90	0.30	3.49	3.036		
		Catch pit short wall	Cum	1	1.80	0.30	3.49	1.885		
		Apron Side Wall	Cum	2	4.50	0.40	0.45	1.620		
		Apron Flooring	Cum	1	4.50	3.20	0.30	4.320		
		Apron toe Wall	Cum	1	3.20	0.50	0.50	0.800		
		Total	Cum					45.569	4934.00	224837.45
7	13.3	Plastering with cement mortar (1:3) in sub-structure as per Technical specifications								
		12mm thick plaster in CM 1:3 Long wall	Sqm	2	2.60		3.49	18.148		
		12mm thick plaster in CM 1:3 short wall	Sqm	1	1.80		3.49	6.282		
		Total	Sqm					24.430	166.20	4060.27

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
8	13.10	**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.	Cum	2	9.40	0.6	2.4	27.072	1291.00	34949.95
9	13.09	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification A -- Granular material	Cum	1	7.66	4.6	2.89	101.832	1251.00	127391.83
									Construction cost =	**1,126,843.77**
		Carriage of Materials								
5	1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
		For M15 grade concrete								
		a) Sand		0.450	9.626		Cum	4.332	105.00	454.860
		b) Aggregates		0.90	9.626		Cum	8.663	105.00	909.615
		c) Cement		0.280	9.626		Ton	2.695	215.00	579.425
		For M20 grade concrete								
		a) Sand		0.450	0.350		Cum	0.158	105.00	16.590
		b) Aggregates		0.90	0.350		Cum	0.315	105.00	33.075
		c) Cement		0.344	0.350		Ton	0.120	215.00	25.800
		For M25 grade concrete								
		a) Sand		0.450	37.970		Cum	17.087	105.00	1,794.135
		b) Aggregates		0.90	37.970		Cum	34.173	105.00	3,588.165
		c) Cement		0.403	37.970		Ton	15.302	215.00	3,289.930
		d) Steel		1.050	3.040		Ton	3.192	215.00	686.280
		For Plum concrete								
		a) Sand		0.45	45.569		Cum	20.506	105.00	2,153.130
		b) Aggregates		0.36	45.569		Cum	16.405	105.00	1,722.525
		c) Cement		0.28	45.569		Ton	12.759	215.00	2,743.185
		d) Masonry stone		0.54	45.569		Cum	24.607	105.00	2,583.735
		Back filling material		1.2	27.072		Cum	32.486	105.00	3,411.030
		Plastering with c.m. (1:3) for catch pit								
		a) Sand		0.015	24.430		Cum	0.366	105.00	38.430
		b) Cement		0.007	24.430		Ton	0.171	215.00	36.765

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
	1.4	Cost of Haulage Excluding Loading and Unloading		Lead		Unit Weight				
	(i)	Surfaced Road								
		a) Cement		135.00	Kms		T/Km	31.047	6.70	28082.01
		b) Steel		135.00	Kms		T/Km	3.192	6.70	2887.16
		c) Masonry stone		5.00	Kms	1.74	T/Km	56.526	6.70	1893.62
		d Stone Aggregates		55.00	Kms	1.74	T/Km	160.153	6.70	59016.38
		e) Sand		55.00	Kms	1.84	T/Km	78.106	6.70	28782.06
	(ii)	Case-II : Unsurfaced Gravelled Road								
		a) Cement		0.00	Kms		T/Km	31.047	8.40	0.00
		b) Steel		0.00	Kms		T/Km	3.192	8.40	0.00
		c) Masonry stone		0.00	Kms		T/Km	56.526	8.40	0.00
		d Stone Aggregates		2.00	Kms		T/Km	160.153	8.40	2690.57
		e) Sand		2.00	Kms		T/Km	78.106	8.40	1312.18

Carriage cost = 148730.66

Cost for Box culvert = 1275574.43

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

COST ESTIMATE FOR RCC BOX CULVERT TYPE-II

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Catch pit size Width X Length	1.80 m	x	3.60 m					
Catch pit wall thickness	0.30 m		Top width of wall			=		0.600 m
Height of Upstream wall	5.27 m	Bottom Width	=	2.708 m	Length	=		5.840 m
Height of Downstream wall	6.67 m	Bottom Width	=	3.268 m	Length	=		9.840 m
Width of U/S head wall at box bottom level	=	2.5 m	Width of D/S head wall at box bottom			=		3.008 m
Width of U/S head wall at box top level	=	1.0 m	Width of D/S head wall at box top leve			=		1.480 m
Length of wing wall U/S	=	1.00 m	Length of wing wall D/S			=		1.000 m
Span	**=**	**3.00 m**	Wall thinkness " f "			=		0.420 m
Depth	**=**	**3.00 m**	Bottom slab offset " c "			=		0.900 m
Barrel length	**=**	**10.00 m**	Bottom slab thickness " e "			=		0.420 m
Top slab thickness " d "	=	0.40 m	PCC thickness			=		0.150 m

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
1	3.13	**Excavation for Structures** (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.)								
		Up stream head wall	Cum	1	5.99	2.86	5.42	92.852		
		Down stream head wall	Cum	1	9.99	3.42	3.49	119.239		
		Culvert beding	Cum	1	4.49	5.94	4.46	118.951		
		Catch pit	Cum	1	3.75	1.88	4.68	32.994		
		Apron	Cum	1	4.50	4.20	0.30	5.670		
		Total	Cum					369.706		
	I	Ordinary Soil A.Manual means (i) upto 3m depth	Cum	70%				258.794	357.00	92389.46
	II	Ordinary rock (not requiring blasting) A.Manual means (i) upto 3m depth	Cum	30%				110.912	447.00	49577.66
2	12.8-A	Provide M15 plain cement concrete levelling course below box bedding ,wingwalls, catch pits, cross drains etc. complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.								
		Up stream head wall footing	Cum	1	5.99	2.86	0.15	2.570		
		Down stream head wall footing	Cum	1	9.99	3.42	0.15	5.125		
		Box Bedding	Cum	1	4.49	5.94	0.15	4.001		
		Catch pit	Cum	1	3.75	2.03	0.15	1.142		
		Total	Cum					12.838	6824.00	87606.51

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
3	12.8-B	Provide M20 plain cement concrete levelling course in catch pit complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.	Cum	1	3.600	1.800	0.075	0.49	7782.00	3813.18
4	12.8-E	Plain/Reinforced cement concrete M25 in sub-structure complete as per drawing and technical specifications								
		base slab	Cum	1	10.00	5.64	0.420	23.688		
		side wall	Cum	2	10.00	0.42	3.00	25.200		
		top slab	Cum	1	10.00	3.84	0.400	15.360		
		Hunch	Cum	4	10.00	0.15	0.15	0.450		
		Wing wall	Cum	4	1.00	0.3	3.40	2.040		
		Total	Cum					66.738	8499.00	567206.26
5	12.40	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications								
		80 kg/Cum	MT	1.00				5.34	84490.00	451176.60
6	A	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete.								
		Up stream head wall	Cum	1	5.84	1.65	5.27	25.391		
		Down stream head wall	Cum	1	9.84	1.93	6.67	63.336		
		Deduction of box portion in U/S H/W	Cum	-1	5.84	1.75	3.82	-19.520		
		Deduction of box portion in D/S H/W	Cum	-1	5.84	2.24	3.82	-24.986		
		Parapet Wall	Cum	4	2.00	0.60	0.45	1.080		
		Catch pit Long wall	Cum	2	3.90	0.30	4.53	5.300		
		Catch pit short wall	Cum	1	1.80	0.30	4.53	2.446		
		Apron Side Wall	Cum	2	4.50	0.40	0.45	1.620		
		Apron Flooring	Cum	1	4.50	4.20	0.30	5.670		
		Apron toe Wall	Cum	1	4.20	0.50	0.50	1.050		
		Total	Cum					61.387	4934.00	302883.46
7	13.3	Plastering with cement mortar (1:3) in sub-structure as per Technical specifications								
		12mm thick plaster in CM 1:3 Long wall	Sqm	2	3.60		4.53	32.616		
		12mm thick plaster in CM 1:3 short wall	Sqm	1	1.80		4.53	8.154		
		Total	Sqm					40.770	166.20	6775.97

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
8	13.10	**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.	Cum	2	9.40	0.6	3.4	38.352	1291.00	49512.43
9	13.09	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification A -- Granular material	Cum	1	7.245	5.84	3.41	144.280	1251.00	180494.28
									Construction cost =	**1,791,435.81**
		Carriage of Materials								
5	1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
		For M15 grade concrete								
		a) Sand		0.450	12.838		Cum	5.777	105.00	606.585
		b) Aggregates		0.90	12.838		Cum	11.554	105.00	1,213.170
		c) Cement		0.280	12.838		Ton	3.595	215.00	772.925
		For M20 grade concrete								
		a) Sand		0.450	0.490		Cum	0.221	105.00	23.205
		b) Aggregates		0.90	0.490		Cum	0.441	105.00	46.305
		c) Cement		0.344	0.490		Ton	0.169	215.00	36.335
		For M25 grade concrete								
		a) Sand		0.450	66.738		Cum	30.032	105.00	3,153.360
		b) Aggregates		0.90	66.738		Cum	60.064	105.00	6,306.720
		c) Cement		0.403	66.738		Ton	26.895	215.00	5,782.425
		d) Steel		1.050	5.340		Ton	5.607	215.00	1,205.505
		For Plum concrete								
		a) Sand		0.45	61.387		Cum	27.624	105.00	2,900.520
		b) Aggregates		0.36	61.387		Cum	22.099	105.00	2,320.395
		c) Cement		0.28	61.387		Ton	17.188	215.00	3,695.420
		d) Masonry stone		0.54	61.387		Cum	33.149	105.00	3,480.645
		Back filling material		1.2	38.352		Cum	46.022	105.00	4,832.310
		Plastering with c.m. (1:3) for catch pit								
		a) Sand		0.015	40.770		Cum	0.612	105.00	64.260
		b) Cement		0.007	40.770		Ton	0.285	215.00	61.275

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
	1.6	Cost of Haulage Excluding Loading and Unloading		Lead		Unit Weight				
	(i)	Surfaced Road								
		a) Cement		135.00	Kms		T/Km	48.132	6.70	43535.394
		b) Steel		135.00	Kms		T/Km	5.607	6.70	5071.532
		c) Masonry stone		5.00	Kms	1.74	T/Km	80.078	6.70	2682.613
		d Stone Aggregates		55.00	Kms	1.74	T/Km	243.913	6.70	89881.941
		e) Sand		55.00	Kms	1.84	T/Km	118.249	6.70	43574.757
	(ii)	Case-II : Unsurfaced Gravelled Road								
		a) Cement		0.00	Kms		T/Km	48.132	8.40	0.000
		b) Steel		0.00	Kms		T/Km	5.607	8.40	0.000
		c) Masonry stone		0.00	Kms		T/Km	80.078	8.40	0.000
		d Stone Aggregates		2.00	Kms		T/Km	243.913	8.40	4097.738
		e) Sand		2.00	Kms		T/Km	118.249	8.40	1986.583

Carriage cost = 227331.92

Cost for Box culvert = 2018767.73

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

COST ESTIMATE FOR RCC BOX CULVERT TYPE-III

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Catch pit size Width X Length	1.80 m	x	4.60 m					
Catch pit wall thickness	0.30 m		Top width of wall			=		0.600 m
Height of Upstream wall	6.48 m	Bottom Width	=	3.192 m	Length	=		7.100 m
Height of Downstream wall	7.88 m	Bottom Width	=	3.752 m	Length	=		11.100 m
Width of U/S head wall at box bottom level	=	3.0 m	Width of D/S H/W at box bottom leve			=		3.492 m
Width of U/S head wall at box top level	=	1.0 m	Width of D/S H/W at box top level			=		1.480 m
Length of wing wall U/S	=	1.00 m	Length of wing wall D/S			=		1.000 m
Span	**=**	**4.00 m**	Wall thinkness " f "			=		0.550 m
Depth	**=**	**4.00 m**	Bottom slab offset " c "			=		1.200 m
Barrel length	**=**	**10.00 m**	Bottom slab thickness " e "			=		0.550 m
Top slab thickness " d "	=	0.48 m	PCC thickness			=		0.150 m

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
1	3.13	**Excavation for Structures** (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.)								
		Up stream head wall	Cum	1	7.25	3.34	6.63	160.545		
		Down stream head wall	Cum	1	11.25	3.90	4.09	179.449		
		Culvert beding	Cum	1	3.51	7.80	5.36	146.746		
		Catch pit	Cum	1	4.75	1.88	5.89	52.598		
		Apron	Cum	1	4.50	5.20	0.30	7.020		
		Total	Cum					546.358		
	I	Ordinary Soil A.Manual means (i) upto 3m depth	Cum	70%				382.451	357.00	136535.01
	II	Ordinary rock (not requiring blasting) A.Manual means (i) upto 3m depth	Cum	30%				163.907	447.00	73266.43
2	12.8-A	Provide M15 plain cement concrete levelling course below box bedding ,wingwalls, catch pits, cross drains etc. complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.								
		Up stream head wall footing	Cum	1	7.25	3.34	0.15	3.632		
		Down stream head wall footing	Cum	1	11.25	3.9	0.15	6.581		
		Box Bedding	Cum	1	3.51	7.8	0.15	4.107		
		Catch pit	Cum	1	4.75	2.03	0.15	1.446		
		Total	Cum					15.766	6824.00	107587.18

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
3	12.8-B	Provide M20 plain cement concrete levelling course in catch pit complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.	Cum	1	4.600	1.800	0.075	0.62	7782.00	4824.84
4	12.8-E	Plain/Reinforced cement concrete M25 in sub-structure complete as per drawing and technical specifications								
		base slab	Cum	1	10.00	7.5	0.550	41.250		
		side wall	Cum	2	10.00	0.55	4.00	44.000		
		top slab	Cum	1	10.00	5.1	0.480	24.480		
		Hunch	Cum	4	10.00	0.15	0.15	0.450		
		Wing wall	Cum	4	1.00	0.3	4.48	2.688		
		Total	Cum					112.868	8499.00	959265.13
5	12.40	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications								
		80 kg/Cum	MT	1.00				9.03	84490.00	762944.70
6	A	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete.								
		Up stream head wall	Cum	1	7.10	1.90	6.48	43.708		
		Down stream head wall	Cum	1	11.10	2.18	7.88	95.340		
		Deduction of box portion in U/S H/W	Cum	-1	7.10	2.00	5.03	-35.713		
		Deduction of box portion in D/S H/W	Cum	-1	7.10	2.49	5.03	-44.463		
		Parapet Wall	Cum	4	2.00	0.60	0.45	1.080		
		Catch pit Long wall	Cum	2	4.90	0.30	5.74	8.438		
		Catch pit short wall	Cum	1	1.80	0.30	5.74	3.100		
		Apron Side Wall	Cum	2	4.50	0.40	0.45	1.620		
		Apron Flooring	Cum	1	4.50	5.20	0.30	7.020		
		Apron toe Wall	Cum	1	5.20	0.50	0.50	1.300		
		Total	Cum					81.430	4934.00	401775.62
7	13.3	Plastering with cement mortar (1:3) in sub-structure as per Technical specifications								
		12mm thick plaster in CM 1:3 Long wall	Sqm	2	4.60		5.74	52.808		
		12mm thick plaster in CM 1:3 short wall	Sqm	1	1.80		5.74	10.332		
		Total	Sqm					63.140	166.20	10493.87

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
8	13.10	**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.	Cum	2	9.40	0.6	4.48	50.534	1291.00	65239.39
9	13.09	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification A -- Granular material	Cum	1	6.755	7.1	4.015	192.561	1251.00	240893.81
									Construction cost =	**2,762,825.98**
		Carriage of Materials								
5	1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
		For M15 grade concrete								
		a) Sand		0.450	15.77		Cum	7.097	105.00	745.185
		b) Aggregates		0.90	15.77		Cum	14.193	105.00	1,490.265
		c) Cement		0.280	15.77		Ton	4.416	215.00	949.440
		For M20 grade concrete								
		a) Sand		0.450	0.62		Cum	0.279	105.00	29.295
		b) Aggregates		0.90	0.62		Cum	0.558	105.00	58.590
		c) Cement		0.344	0.62		Ton	0.213	215.00	45.795
		For M25 grade concrete								
		a) Sand		0.450	112.87		Cum	50.792	105.00	5,333.160
		b) Aggregates		0.90	112.87		Cum	101.583	105.00	10,666.215
		c) Cement		0.403	112.87		Ton	45.487	215.00	9,779.705
		d) Steel		1.050	9.03		Ton	9.482	215.00	2,038.630
		For Plum concrete								
		a) Sand		0.45	81.43		Cum	36.644	105.00	3,847.620
		b) Aggregates		0.36	81.43		Cum	29.315	105.00	3,078.075
		c) Cement		0.28	81.43		Ton	22.800	215.00	4,902.000
		d) Masonry stone		0.54	81.43		Cum	43.972	105.00	4,617.060
		Back filling material		1.2	50.53		Cum	60.636	105.00	6,366.780
		Plastering with c.m. (1:3) for catch pit								
		a) Sand		0.015	63.14		Cum	0.947	105.00	99.435
		b) Cement		0.007	63.14		Ton	0.442	215.00	95.030

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
	1.6	Cost of Haulage Excluding Loading and Unloading		Lead		Unit Weight				
	(i)	Surfaced Road								
		a) Cement		135.00	Kms		T/Km	73.358	6.70	66352.311
		b) Steel		135.00	Kms		T/Km	9.482	6.70	8576.469
		c) Masonry stone		5.00	Kms	1.74	T/Km	105.507	6.70	3534.485
		d Stone Aggregates		55.00	Kms	1.74	T/Km	358.936	6.70	132267.916
		e) Sand		55.00	Kms	1.84	T/Km	176.197	6.70	64928.595
	(ii)	Case-II : Unsurfaced Gravelled Road								
		a) Cement		0.00	Kms		T/Km	73.358	8.40	0.000
		b) Steel		0.00	Kms		T/Km	9.482	8.40	0.000
		c) Masonry stone		0.00	Kms		T/Km	105.507	8.40	0.000
		d Stone Aggregates		2.00	Kms		T/Km	358.936	8.40	6030.125
		e) Sand		2.00	Kms		T/Km	176.197	8.40	2960.110

Carriage cost = 338792.29

Cost for Box culvert = 3101618.27

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

COST ESTIMATE FOR RCC BOX CULVERT TYPE-IV

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Catch pit size Width X Length	1.80 m	x	6.60 m					
Catch pit wall thickness	0.30 m		Top width of wall			=		0.600 m
Height of Upstream wall	7.00 m	Bottom Width	=	3.400 m	Length	=		9.600 m
Height of Downstream wall	8.4 m	Bottom Width	=	3.960 m	Length	=		11.600 m
Width of U/S head wall at box bottom level	=	3.2 m	Width of D/S head wall at box bottom			=		3.700 m
Width of U/S head wall at box top level	=	1.0 m	Width of D/S head wall at box top leve			=		1.480 m
Length of wing wall U/S	=	1.00 m	Length of wing wall D/S			=		1.000 m
Span	**=**	**6.00 m**	Wall thinkness " f "			=		0.800 m
Depth	**=**	**4.00 m**	Bottom slab offset " c "			=		1.800 m
Barrel length	**=**	**10.00 m**	Bottom slab thickness " e "			=		0.850 m
Top slab thickness " d "	=	0.70 m	PCC thickness			=		0.150 m

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
1	3.13	**Excavation for Structures** (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.)								
		Up stream head wall	Cum	1	9.75	3.55	7.15	247.479		
		Down stream head wall	Cum	1	11.75	4.11	4.35	210.072		
		Culvert beding	Cum	1	3.10	11.50	5.75	204.988		
		Catch pit	Cum	1	6.75	1.88	6.41	81.343		
		Apron	Cum	1	4.50	7.20	0.30	9.720		
		Total	Cum					753.602		
	I	Ordinary Soil A.Manual means (i) upto 3m depth	Cum	70%				527.521	357.00	188325.00
	II	Ordinary rock (not requiring blasting) A.Manual means (i) upto 3m depth	Cum	30%				226.081	447.00	101058.21
2	12.8-A	Provide M15 plain cement concrete levelling course below box bedding ,wingwalls, catch pits, cross drains etc. complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.								
		Up stream head wall footing	Cum	1	9.75	3.55	0.15	5.192		
		Down stream head wall footing	Cum	1	11.75	4.11	0.15	7.244		
		Box Bedding	Cum	1	3.1	11.5	0.15	5.348		
		Catch pit	Cum	1	6.75	2.03	0.15	2.055		
		Total	Cum					19.839	6824.00	135381.34

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
3	12.8-B	Provide M20 plain cement concrete levelling course in catch pit complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.	Cum	1	6.600	1.800	0.075	0.89	7782.00	6925.98
4	12.8-E	Plain/Reinforced cement concrete M25 in sub-structure complete as per drawing and technical specifications								
		base slab	Cum	1	10.00	11.2	0.850	95.200		
		side wall	Cum	2	10.00	0.8	4.00	64.000		
		top slab	Cum	1	10.00	7.6	0.700	53.200		
		Hunch	Cum	4	10.00	0.15	0.15	0.450		
		Wing wall	Cum	4	1.00	0.3	4.70	2.820		
		Total	Cum					215.670	8499.00	1832979.33
5	12.40	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications								
		80 kg/Cum	MT	1.00				17.25	84490.00	1457452.50
6	A	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete.								
		Up stream head wall	Cum	1	9.60	2.00	7.00	67.200		
		Down stream head wall	Cum	1	11.60	2.28	8.40	111.082		
		Deduction of box portion in U/S H/W	Cum	-1	9.60	2.10	5.55	-55.944		
		Deduction of box portion in D/S H/W	Cum	-1	9.60	2.59	5.55	-68.998		
		Parapet Wall	Cum	4	2.00	0.60	0.45	1.080		
		Catch pit Long wall	Cum	2	6.90	0.30	6.26	12.958		
		Catch pit short wall	Cum	1	1.80	0.30	6.26	3.380		
		Apron Side Wall	Cum	2	4.50	0.40	0.45	1.620		
		Apron Flooring	Cum	1	4.50	7.20	0.30	9.720		
		Apron toe Wall	Cum	1	7.20	0.50	0.50	1.800		
		Total	Cum					83.898	4934.00	413952.73
7	13.3	Plastering with cement mortar (1:3) in sub-structure as per Technical specifications								
		12mm thick plaster in CM 1:3 Long wall	Sqm	2	6.60		6.26	82.632		
		12mm thick plaster in CM 1:3 short wall	Sqm	1	1.80		6.26	11.268		
		Total	Sqm					93.900	166.20	15606.18

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
8	13.10	**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.	Cum	2	9.40	0.6	4.7	53.016	1291.00	68443.66
9	13.09	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification A -- Granular material	Cum	1	6.55	9.6	4.275	268.812	1251.00	336283.81
								Construction cost =		**4,556,408.74**
		Carriage of Materials								
5	1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
		For M15 grade concrete								
		a) Sand		0.450	19.839		Cum	8.928	105.00	937.440
		b) Aggregates		0.90	19.839		Cum	17.855	105.00	1,874.775
		c) Cement		0.280	19.839		Ton	5.555	215.00	1,194.325
		For M20 grade concrete								
		a) Sand		0.450	0.890		Cum	0.401	105.00	42.105
		b) Aggregates		0.90	0.890		Cum	0.801	105.00	84.105
		c) Cement		0.344	0.890		Ton	0.306	215.00	65.790
		For M25 grade concrete								
		a) Sand		0.450	215.67		Cum	97.052	105.00	10,190.460
		b) Aggregates		0.90	215.67		Cum	194.103	105.00	20,380.815
		c) Cement		0.403	215.67		Ton	86.915	215.00	18,686.725
		d) Steel		1.050	17.250		Ton	18.113	215.00	3,894.295
		For Plum concrete								
		a) Sand		0.45	83.90		Cum	37.755	105.00	3,964.275
		b) Aggregates		0.36	83.90		Cum	30.204	105.00	3,171.420
		c) Cement		0.28	83.90		Ton	23.492	215.00	5,050.780
		d) Masonry stone		0.54	83.90		Cum	45.306	105.00	4,757.130
		Back filling material		1.2	53.016		Cum	63.619	105.00	6,679.995
		Plastering with c.m. (1:3) for catch pit								
		a) Sand		0.015	93.90		Cum	1.409	105.00	147.945
		b) Cement		0.007	93.90		Ton	0.657	215.00	141.255

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
	1.6	Cost of Haulage Excluding Loading and Unloading		Lead		Unit Weight				
	(i)	Surfaced Road								
		a) Cement		135.00	Kms		T/Km	116.925	6.70	105758.66
		b) Steel		135.00	Kms		T/Km	18.113	6.70	16383.21
		c) Masonry stone		5.00	Kms	1.74	T/Km	110.697	6.70	3708.35
		d Stone Aggregates		55.00	Kms	1.74	T/Km	533.453	6.70	196577.43
		e) Sand		55.00	Kms	1.84	T/Km	267.803	6.70	98685.41
	(ii)	Case-II : Unsurfaced Gravelled Road								
		a) Cement		0.00	Kms		T/Km	116.925	8.40	0.00
		b) Steel		0.00	Kms		T/Km	18.113	8.40	0.00
		c) Masonry stone		0.00	Kms		T/Km	110.697	8.40	0.00
		d Stone Aggregates		2.00	Kms		T/Km	533.453	8.40	8962.01
		e) Sand		2.00	Kms		T/Km	267.803	8.40	4499.09

Carriage cost = 515837.80

Cost for Box culvert = 5072246.5

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

COST ESTIMATE FOR RCC BOX CULVERT TYPE-V

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

		Up stream Side				Down stream side		
Flexible Apporn	Length	=	3.20 m	Length	=	5.00 m
	Width	=	11.80 m	Width	=	11.80 m
	Depth	=	0.40 m	Depth	=	0.40 m
Curtain Wall	Length	=	18.20 m	Length	=	21.80 m
	Top Width	=	0.20 m	Width	=	0.20 m
	Bottom width	=	1.30 m	Bottom width	=	1.65 m
	Depth	=	2.00 m	Depth	=	2.50 m
RCC Box	**Span**	**=**	**8.000 m**	Key U/S length	=	8.00 m
	Depth	**=**	**6.000 m**	Key U/S Top width	=	1.20 m
	Barrel length	=	11.000 m	Key U/S bottom width	=	0.30 m
	Bottom slab offset " c "	**=**	**0.900 m**	Key U/S depth	=	1.20 m
	Top slab thickness " d "	**=**	**0.800 m**	Key D/S length	=	8.00 m
	Bottom slab thickness " e "	**=**	**0.970 m**	Key D/S Top width	=	1.20 m
	Wall thinkness " f "	**=**	**1.000 m**	Key D/S bottom width	=	0.30 m
	PCC thickness	=	0.150 m	Key D/S depth	=	1.20 m

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
1	3.13	**Excavation for Structures** (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.)								
		Curtain Wall U/S	Cum	1	18.40	1.50	2.10	57.96		
		Curtain Wall D/S	Cum	1	22.00	1.85	2.60	105.82		
		Culvert beding	Cum	1	8.60	12.10	1.62	168.58		
		Key U/S	Cum	1	8.00	0.75	1.20	7.20		
		Key U/S	Cum	1	8.00	0.75	1.20	7.20		
		Apron U/S	Cum	1	3.20	11.80	0.90	33.98		
		Apron D/S	Cum	1	5.00	11.80	0.90	53.10		
		Total	Cum					433.840		
	I	Ordinary Soil B. Mechanical Means (Depth upto 3 m)	Cum	100%				433.840	357.00	154880.88

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
2	12.8-A	Provide M15 plain cement concrete levelling course below box bedding ,wingwalls, catch pits, cross drains etc. complete as per Drawings and Technical Specification Clause 1500,1700 & 2100.								
		Curtain Wall U/S	Cum	1	18.40	1.50	0.10	2.760		
		Curtain Wall D/S	Cum	1	22.00	1.85	0.10	4.070		
		Culvert beding	Cum	1	8.60	12.10	0.15	15.609		
		Key U/S	Cum	1	8.00	2.15	0.15	2.580		
		Key D/S	Cum	1	8.00	2.15	0.15	2.580		
		Curtain toe Wall U/S	Cum	1	18.20	0.75	2.00	27.300		
		Curtain toe Wall D/S	Cum	1	21.80	0.93	2.50	50.685		
		Total	Cum					105.584	6824.00	720505.22
3	12.8-E	Plain/Reinforced cement concrete M25 in sub-structure complete as per drawing and technical specifications								
		Base slab	Cum	1	11.00	11.80	0.97	125.906		
		Side wall	Cum	2	11.00	1.00	6.00	132.000		
		Top slab	Cum	1	11.00	10.00	0.80	88.000		
		Hunch	Cum	4	11.00	0.15	0.08	0.528		
		Key U/S	Cum	1	8.00	0.75	0.23	1.380		
		Key D/S	Cum	1	8.00	0.75	0.23	1.380		
		Return wall -I	Cum	4	0.90	0.30	7.10	7.668		
		Parapet wall	Cum	2	8.00	0.35	0.9	5.040		
		Total	Cum					361.902	8499.00	3075805.10
4	12.40	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications								
		100 kg/Cum	MT	1.00				36.19	84490.00	3057693.10
5	13.10	**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.	Cum	2	10.40	0.60	6.00	74.88	1291.00	96670.08
6	13.09	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification								
		A -- Granular material	Cum	1	9.80	0.90	6.00	52.92	1251.00	66202.92

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
7	15.8	Providing and laying Flooring complete as per drawing and Technical specifications laid over cement concrete bedding.								
	A	Rubble stone laid in cement mortar 1:3	Cum							
		Apron U/S	Cum	1	3.20	11.80	0.40	15.10		
		Apron D/S	Cum	1	5.00	11.80	0.40	23.60		
		Total	Cum					38.70	6140.00	237618.00
8	4.1	Construction of granular sub-base by providing the material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading on prepared surface and compacting with plate vibratory to achieve the desired density, complete as per clause 401)								
		Culvert beding	Cum	1	11.00	12.10	0.20	26.62		
		Apron U/S	Cum	1	3.20	11.80	0.20	7.55		
		Apron D/S	Cum	1	5.00	11.80	0.20	11.80		
		Total	Cum					45.97	2816.00	129451.52
									Construction cost =	**7,538,826.82**
		Carriage of Materials								
9	1.1	Loading and unloading by manual means	**Unit of reqd**		**Total quantity**					
		For M15 grade concrete								
		a) Sand		0.450	105.584		Cum	47.513	105.000	4,988.865
		b) Aggregates		0.90	105.584		Cum	95.026	105.000	9,977.730
		c) Cement		0.280	105.584		Ton	29.564	215.000	6,356.260
		For M25 grade concrete								
		a) Sand		0.450	361.90		Cum	162.855	105.000	17,099.775
		b) Aggregates		0.90	361.90		Cum	325.710	105.000	34,199.550
		c) Cement		0.403	361.90		Ton	145.846	215.000	31,356.890
		d) Steel		1.050	36.190		Ton	38.000	215.000	8,170.000
		For Masonry works 1:3 for walls								
		a) Sand		0.32	38.70		Cum	12.384	105.000	1,300.320
		b) Aggregates		0.20	38.70		Cum	7.740	105.000	812.700
		c) Cement		0.15	38.70		Ton	5.805	215.000	1,248.075
		d) Masonry stone		0.95	38.70		Cum	36.765	105.000	3,860.325
		Filter media		1.2	74.880		Cum	89.856	105.000	9,434.880
		Granular Material								
		a) Sand		0.384	98.89		Cum	37.974	105.000	3,987.270
		b) Aggregates		0.893	98.89		Cum	88.309	105.000	9,272.445

Sl. No.	Ref to SOR	Description	A/U	nos.	Length	Width	Depth	Quantity	Rate	Amount
10	1.6	Cost of Haulage Excluding Loading and Unloading								
	(i)	Surfaced Road		Lead		Unit Weight				
		a) Cement		135.00	Kms		T/Km	181.215	6.70	163,908.968
		b) Steel		135.00	Kms		T/Km	38.000	6.70	34,371.000
		c) Masonry stone		5.00	Kms	1.74	T/Km	63.971	6.70	2,143.029
		d Stone Aggregates		55.00	Kms	1.74	T/Km	899.206	6.70	331,357.411
		e) Sand		55.00	Kms	1.84	T/Km	645.071	6.70	237,708.664
	(ii)	Case-II : Unsurfaced Gravelled Road								
		a) Cement		0.00	Kms		T/Km	181.215	8.40	0.000
		b) Steel		0.00	Kms		T/Km	38.000	8.40	0.000
		c) Masonry stone		0.00	Kms		T/Km	63.971	8.40	0.000
		d Stone Aggregates		2.00	Kms		T/Km	899.206	8.40	15,106.661
		e) Sand		2.00	Kms		T/Km	645.071	8.40	10,837.193

Carriage cost = 937498.01

Cost for Box culvert = 8476324.83

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

DETAILED COST CALCULATION OF CHUTE TYPE-I

Length (L) = 10.00
Clear Width (W) = 1.85
Height of Chute Wall (H) 0.60

Sr. No	Ref to SOR	Item of Work	A/U	Nos	Length (M)	Breadth (M)	Height (M)	Quantity	Rate	Amount
1	**2.3**	**Clearing and Grubbing Road Land.** (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.)								
	(i)	**By Manual Means:-**								
	A	**In area of light jungle**	Ha	1.00	10.00	3.65		0.0037	67001.00	247.90
2	3.11	**Excavation for Structures** (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	Ordinary Soil (A) Manual means	Cum	1	10.00	2.65	0.70	18.55	357.00	6622.35
3	12.8	Plain/Reinforced cement concrete in open foundation as per drawing and technical specifications								
	A	PCC Grade M15	Cum	1	10.00	2.65	0.10	2.65	6824.00	18083.60
4	A	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete.								
		Chute Bed	Cum	1	10.00	1.85	0.30	5.55		
		Chute Walls	Cum	2	10.00	0.60	0.30	3.60		
								9.15	4934.00	45146.10

Sr. No	Ref to SOR	Item of Work	A/U	Nos	Length (M)	Breadth (M)	Height (M)	Quantity	Rate	Amount
5	13.09	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification A -- Granular material ***Inside Chute Walls***	Cum	2	10.00	0.10	0.60	1.200	1251.00	1501.20
6	Ch-1	***Carriage of Materials***								
	1.1	Loading and unloading of stone aggregates	Cum					2.491	105.00	261.56
		Loading and unloading of masonry stone	Cum					10.065	105.00	1056.83
		Loading and unloading of sand	Cum					4.130	105.00	433.65
	1.3	Loading and unloading of cement by manual means and stacking	Tonne					1.983	215.00	426.35
	1.6	Cost of Haulage Excluding Loading and Unloading								
	(i)	Surfaced Road								
		a) Sand	ton. km	55.00				7.599	6.70	2800.23
		b) Aggregates	ton. km	55.00				4.334	6.70	1597.08
		c) Cement	ton. km	135.00				1.983	6.70	1793.62
		d) Masonry stone	ton. km	5.00				17.513	6.70	586.69
	(ii)	Case-II : Unsurfaced Gravelled Road					*Unit wt*			
		a) Cement	ton. km	0.00				1.983	8.40	0.00
		c) Stone Aggregates	ton. km	2.00			1.74	4.334	8.40	72.81
		d) Masonry stone	ton. km	0.00			1.74	17.513	8.40	0.00
		b) Sand	ton. km	2.00			1.84	7.599	8.40	127.66

Total Cost for 10Rm of Chute Type-I = Rs. 80,757.6

Therefore, Rate per Rm = Rs. 8,075.76

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

DETAILED COST CALCULATION OF CHUTE TYPE-II

Length (L) = 10.00
Clear Width (W) = 2.7
Height of Chute Wall (H) 0.60

Sr. No	Ref to SOR	Item of Work	A/U	Nos	Length (M)	Breadth (M)	Height (M)	Quantity	Rate	Amount
1	**2.3**	**Clearing and Grubbing Road Land.** (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.)								
	(i)	**By Manual Means:-**								
	A	**In area of light jungle**	Ha	1.00	10.00	4.50		0.0045	67001.00	301.50
2	3.11	**Excavation for Structures** (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	Ordinary Soil (A) Manual means	Cum	1	10.00	3.50	0.70	24.5	357.00	8746.50
3	12.8	Plain/Reinforced cement concrete in open foundation as per drawing and technical specifications								
	A	PCC Grade M15	Cum	1	10.00	3.50	0.10	3.50	6824.00	23884.00
4	A	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete.								
		Chute Bed	Cum	1	10.00	2.70	0.30	8.10		
		Chute Walls	Cum	2	10.00	0.60	0.30	3.60		
		Total						11.70	4934.00	57727.80

Sr. No	Ref to SOR	Item of Work	A/U	Nos	Length (M)	Breadth (M)	Height (M)	Quantity	Rate	Amount
5	13.09	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification A -- Granular material ***Inside Chute Walls***	Cum	2	10.00	0.10	0.60	1.200	1251.00	1501.20
6	Ch-1	***Carriage of Materials***								
	1.1	Loading and unloading of stone aggregates	Cum					3.290	105.00	345.45
		Loading and unloading of masonry stone	Cum					12.870	105.00	1351.35
		Loading and unloading of sand	Cum					5.331	105.00	559.76
	1.3	Loading and unloading of cement by manual means and stacking	Tonne					2.560	215.00	550.40
	1.4	Cost of Haulage Excluding Loading and Unloading								
	(i)	Surfaced Road								
		a) Sand	ton. km	55.00				9.809	6.70	3614.62
		b) Aggregates	ton. km	55.00				5.725	6.70	2109.66
		c) Cement	ton. km	135.00				2.560	6.70	2315.52
		d) Masonry stone	ton. km	5.00				22.394	6.70	750.20
	(ii)	Case-II : Unsurfaced Gravelled Road								
		a) Cement	ton. km	0.00			*Unit wt*	2.560	8.40	0.00
		c) Stone Aggregates	ton. km	2.00			1.74	5.725	8.40	96.18
		d) Masonry stone	ton. km	0.00			1.74	22.394	8.40	0.00
		b) Sand	ton. km	2.00			1.84	9.809	8.40	164.79

Total Cost for 10Rm of Chute Type-II = Rs. 104,018.93

Therefore, Rate per Rm = Rs. 10,401.89

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

DETAILED COST CALCULATION OF CHUTE TYPE-III

Length (L) = 10.00
Clear Width (W) = 3.2
Height of Chute Wall (H) 0.60

Sr. No	Ref to SOR	Item of Work	A/U	Nos	Length (M)	Breadth (M)	Height (M)	Quantity	Rate	Amount
1	**2.3**	**Clearing and Grubbing Road Land.** (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.)								
	(i)	**By Manual Means:-**								
	A	**In area of light jungle**	Ha	1.00	10.00	5.00		0.0050	67001.00	335.01
2	3.11	**Excavation for Structures** (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	Ordinary Soil (A) Manual means	Cum	1.00	10.00	4.00	0.70	28.00	357.00	9996.00
3	12.8	Plain/Reinforced cement concrete in open foundation as per drawing and technical specifications								
	A	PCC Grade M15	Cum	1.00	10.00	4.00	0.10	4.00	6824.00	27296.00
4	A	Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete.								
		Chute Bed	Cum	1.00	10.00	3.20	0.30	9.60		
		Chute Walls	Cum	2.00	10.00	0.60	0.30	3.60		
							Total =	13.20	4934.00	65128.80

Sr. No	Ref to SOR	Item of Work	A/U	Nos	Length (M)	Breadth (M)	Height (M)	Quantity	Rate	Amount
5	13.09	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification A -- Granular material								
		Inside Chute Walls	Cum	2.00	10.00	0.10	0.60	1.200	1251.00	1501.20
6	Ch-1	***Carriage of Materials***								
	1.1	Loading and unloading of stone aggregates	Cum					3.760	105.00	394.80
		Loading and unloading of masonry stone	Cum					14.520	105.00	1524.60
		Loading and unloading of sand	Cum					6.037	105.00	633.89
	1.3	Loading and unloading of cement by manual means and stacking	Tonne					2.900	215.00	623.50
	1.4	Cost of Haulage Excluding Loading and Unloading								
	(i)	Surfaced Road								
		a) Sand	ton. km	55.00				11.108	6.70	4093.30
		b) Aggregates	ton. km	55.00				6.542	6.70	2410.73
		c) Cement	ton. km	135.00				2.900	6.70	2623.05
		d) Masonry stone	ton. km	5.00				25.265	6.70	846.38
	(ii)	Case-II : Unsurfaced Gravelled Road								
		a) Cement	ton. km	0.00			*Unit wt*	2.900	8.40	0.00
		c) Stone Aggregates	ton. km	2.00			1.74	6.542	8.40	109.91
		d) Masonry stone	ton. km	0.00			1.74	25.265	8.40	0.00
		b) Sand	ton. km	2.00			1.84	11.108	8.40	186.61

Total Cost for 10Rm of Chute Type-III = Rs. 117,703.78

Therefore, Rate per Rm = Rs. 11,770.38

COST ESTIMATE BRIDGE AT KM 63+335		
Sr. No.	**Description**	**Amount (Rs)**
	Span Arrangement = 1X20+1X48	
1	**Foundation**	**9,325,060.18**
2	**Sub Structure**	**12,948,152.66**
3	**Super Structure**	**45,208,613.25**
4	**Launching & Erection @ 15% of 3**	**6,781,291.99**
5	**Carriage of Material**	**970,815.72**
	Grand Total	**75,233,933.79**
	Say	**75,234,000.00**

(Rupees seven crore fifty two lakh thirty four thousand) only

ESTIMATE COST FOR BRIDGE AT KM 63+335

Item No.	SOR ref	Description	Unit	Rate (Rs)	Quantity	Amount (Rs)
A		**Foundation**				
1.0	**12.1 -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				
	I	**Ordinary soil (Manual Means)**				
		(i) Depth upto 3 m	Cum	173.00	2459.54	425500.62
		(ii) 3 m to 6 m depth	Cum	222.00	791.13	175629.97
	III	Hard rock (requiring blasting)	Cum	613.00	104.71	64185.82
2.0	12.8-A	Providing and laying of PCC M 15 levelling course 150 mm thick below the foundation	Cum	6,824.00	71.90	490652.42
3.0		Providing and laying of PCC M 15 in toe portion below SDR Level	Cum	6,824.00	153.98	1050762.43
4.0	12.8-G	Plain/Reinforced cement concrete M30 in open foundation for abutment wall complete as per drawing and technical specifications	Cum	8,522.00	292.30	2490980.60
5.0	12.40	Supplying, fitting and placing uncoated HYSD bar reinforcement in foundation complete as per drawing and Technical specifications	MT	84,490.00	54.77	4627348.32
		Total Foundation				**9325060.18**
B		**Sub Structure**				
1.00	13.5	Plain/Reinforced Cement Concrete in open foundation complete as per Drawing and Technical specifications				
	G-(p)-C-I	a)RCC Grade M 30 upto 5 m	Cum	9,058.00	99.20	898515.32
	G-(q)-C-I	b)RCC Grade M 30 above 5 m and upto 10 m	Cum	9,313.00	99.20	923810.24
	G-(r)-C-I	c)RCC Grade M 30 above 10 m	Cum	9,675.00	132.26	1279625.48
2.00	13.6	Supplying, fitting and placing uncoated HYSD bar reinforcement in substructure complete as per drawing and Technical specifications	MT	84,689.00	63.46	5374607.49
3.00	13.8	Providing weep holes in stone 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 foce. Complete as per drawing and Technical Specifications	Nos	2,033.00	156.00	317148.00
4.00	13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification (A. Granular material)	Cum	1,251.00	465.38	582187.13
5.00	13.10	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the rerquirements laid down in clause 2504.2.2 of MOSRT&H specifications to a thickness of not less than 600mm with smaller size towards the soil and bigger size towards the wall and provided over the enire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical specifications	Cum	1,291.00	89.62	115695.81

Item No.	SOR ref	Description	Unit	Rate (Rs)	Quantity	Amount (Rs)
6.00	13.13	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.	tonne capacity	472.00	7200.00	3398400.00
7.00	13.16	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.	cubic centimetre	1.42	40960.00	58163.20
		Total Sub Structure				**12948152.66**
C		**Super Structure**				
1.00	14.1	Furnishing and placing reinforced/Prestressed cement concrete in superstructure as per drawing and Technical specifications				
	C-(ii)-(r)-C-1	RCC Grade M 30	Cum	11,160.00	155.27	1732792.77
	E-(i)-(p)-C-1	RCC Grade M 40	Cum	10,689.00	112.10	1198224.47
	F-(ii)-(r)-C-1	RCC Grade M 45	Cum	50,458.00	529.40	26712220.23
2.00	14.2	Supplying, fitting and placing HYSD bar reinforcement in superstructure complete as per drawing and Technical specifications	MT	86,265.00	112.76	9727551.30
3.00	14.3	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	MT	200095.00	21.18	4237172.86
4.00	14.5	Providing and laying 56mm 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 reqired level and slope after cleaning the surface including providing anti-skid surface with bitumen precoated fine grained hard stone chipping of 9.50mm nominal size at the rate of 0.005 cum per 10 Sqm ans 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 C protuding 1mm to 4mm over mastiv surfaces all complete as per clause 515.	SQM	484.00	813.86	393905.82
5.00	14.9	Drainage spouts complete as per drawing and Technical Specifications	Nos	2063.00	30.00	61890.00
6.00	14.10	PCC M 15 grade levelling course below approach slab complete as per drawing and Technical	Cum	6563.00	3.83	25152.70
7.00	14.11	Reinforced cement concrete approach slab in RCC M 30 grade including reinforcement and form work complete as per drawing and Technical specifications	Cum	12210.00	25.83	315384.30

Item No.	SOR ref	Description	Unit	Rate (Rs)	Quantity	Amount (Rs)
8.00	14.18-(iii)	Providing and fixing in position 20mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10m to cater for a horizontal movement upto 20mm covered with sealant complete as per drawing and Technical specifications	RM	198.00	24.60	4870.80
9.00	14.22	Providing nad laying of a strip seal expansion joint catering to maximum horizontal movement upto 70mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring	RM	15374.00	52.00	799448.00
		Total Super Structure				**45208613.25**

Carriage of Materials

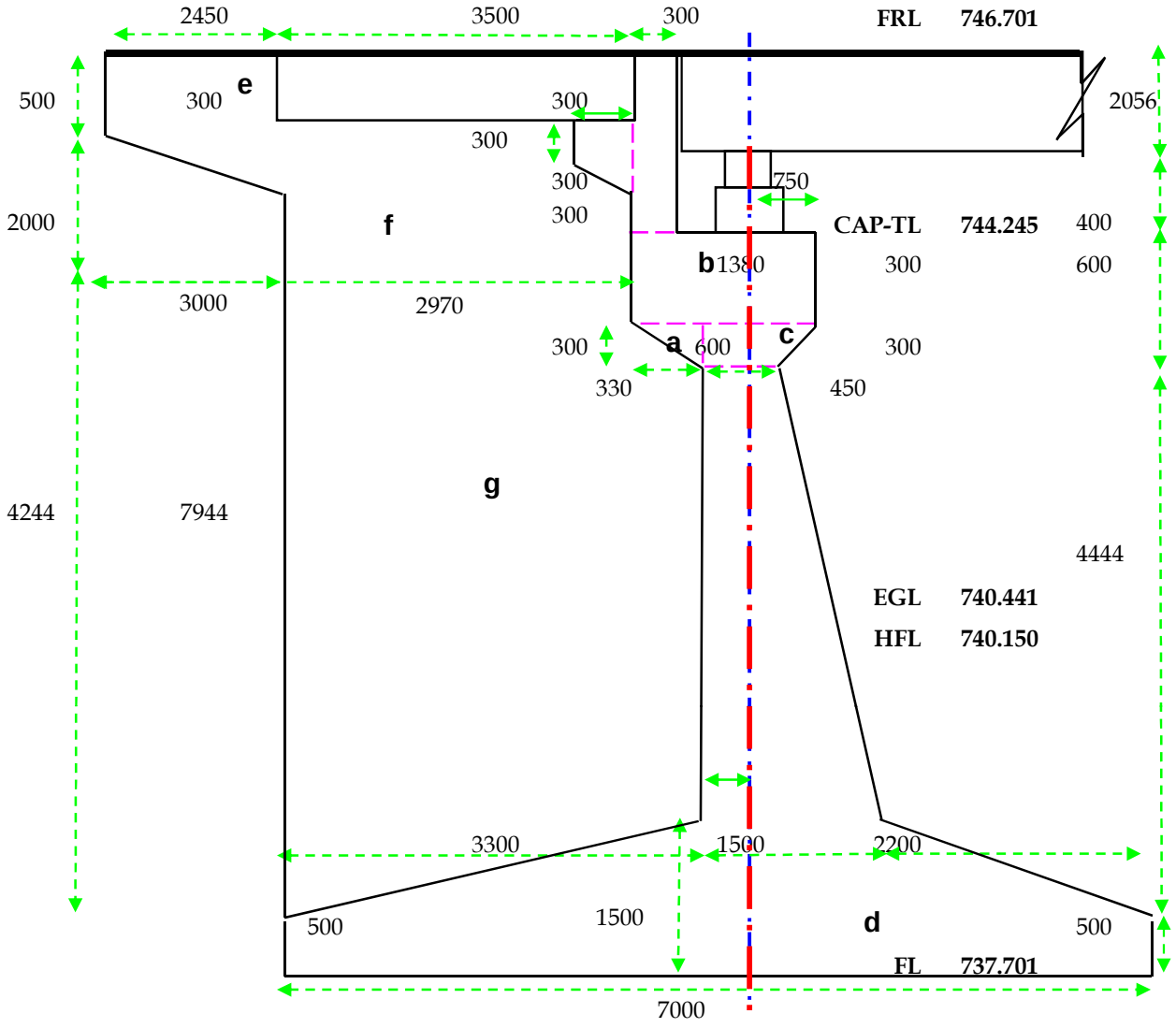
Sr.No.	SOR reference	Description	Unit	Unit of requirement	Total quantity	Unit weight	Carriage distance	Quantity	Rate in Rs	Amount in Rs
1.0	**1.1**	**Loading and unloading of stone boulder/stone aggregates/sand**								
a		**Loading and unloading of stone aggregates**								
		M15 grade concrete	**Cum**	0.89	229.71			204.45	105.00	21466.77
		M30 grade concrete	**Cum**	0.90	804.05			723.65	105.00	75982.80
		M40 grade concrete	**Cum**	0.90	112.10			100.89	105.00	10593.34
		M45 grade concrete	**Cum**	0.90	529.40			476.46	105.00	50027.84
b		**Loading and unloading of sand**								
		M15 grade concrete	**Cum**	0.445	229.71			102.22	105.00	10733.38
		M30 grade concrete	**Cum**	0.450	804.05			361.82	105.00	37991.40
		M40 grade concrete	**Cum**	0.450	112.10			50.44	105.00	5296.67
		M45 grade concrete	**Cum**	0.450	529.40			238.23	105.00	25013.92
c	**1.3**	**Loading and unloading of cement by manual means and stacking**								
		M15 grade concrete	**Cum**	0.320	229.71			73.51	215.00	15804.32
		M30 grade concrete	**Cum**	0.420	804.05			337.70	215.00	72605.78
		M40 grade concrete	**Cum**	0.450	112.10			50.44	215.00	10845.56
		M45 grade concrete	**Cum**	0.450	529.40			238.23	215.00	51218.98
		Steel	**Tonne**	1.050	252.17			264.78	215.00	56927.44
2.0	**1.4**	**Cost of Haulage Excluding Loading and Unloading**								
	(i)	**Surfaced Road**								
		a) Cement	**Ton. km**				135.00	73.51	6.70	66488.40
		b) Stone Aggregates	**Ton. km**				55.00	204.45	6.70	75338.13
		c) Sand	**Ton. km**				55.00	102.22	6.70	37669.06
		d) Steel	**Ton. km**				135.00	264.78	6.70	239492.41

Sr.No.	SOR reference	Description	Unit	Unit of requirement	Total quantity	Unit weight	Carriage distance	Quantity	Rate in Rs	Amount in Rs
	(ii)	**Unsurface road**								
		a) Cement	**Ton. km**				0.00	73.51	8.40	0.00
		b) Stone Aggregates	**Ton. km**			1.74	2.00	204.45	8.40	5976.35
		c) Sand	**Ton. km**			1.84	2.00	102.22	8.40	3159.91
		d) Steel	**Ton. km**				0.00	264.78	8.40	0.00
2.0		**Wearing coat**								
a	**1.1**	Loading and unloading of stone aggregates	**Cum**	0.0135				97.374	105.00	10224.24
b	**1.1**	Loading and unloading of Lime stone dust filler with calcium carbonate	**Cum**	0.0050				36.064	105.00	3786.76
c	**1.3**	Loading/Unloading & Carriage cost of Bitument for wearing coat	**Tonnes**	0.0028				20.196	215.00	4342.15
	1.4	Cost of Haulage Excluding Loading and Unloading								
	(i)	**Surface road**								
a		Bitumens	**Ton. km**				135.00	20.20	6.70	18267.31
b		Line stone dust	**Ton. km**			1.80	135.00	36.06	6.70	58716.37
	(ii)	**Unsurface road**								
a		Bitumens	**Ton. km**				0.00	36.06	8.40	0.00
b		Stone Aggregates	**Ton. km**			1.74	2.00	97.374	8.40	2846.43
c		Lime stone dust	**Ton. km**			1.80	0.00	36.064	8.40	0.00
		Grand Total cost for carriage of material								**970815.72**

QUANTITY CALCULATION FOR ABUTMENT WALL (A1)

Design Data:		
Number of spans	= 1	
Span Length	= 20.56	m
Centre to Centre of span length	= 20.00	m
Number of traffic lanes	= 2	
Overall width of carriageway	= 10.5	m
Overall width bridge	= 13.00	m
Road Crest Level	= 746.701	m
Percentage of camber	= 2.50	%
Depth of T beam	= 2.000	m
Vertical Clearance	= 4.495	m
Soffit level	= 744.645	m
Bottom Level of bearing (Top of pedastal)	= 744.445	m
Top level of abutment cap	= 744.245	m
Bottom of abutment cap	= 743.645	m
H.F.L	= **740.150**	m
Scour level	= **739.701**	m
Existing groung level	= **740.441**	m
Abutment stem bottom Level	**= 739.201**	m
Foundation level	**= 737.701**	m
Number of main girders	= 4	
Width of cap excluding dirt wall	= 1.08	m
Length of bearing	= 0.6	m
Width of bearing	= 0.6	m
Thickness of bearing	= 0.2	m
Depth of bearing pedastal	= 0.2	m
Depth of abutment cap	= 0.6	m
Depth of abutment wall	= 4.444	m
Number of bearings per support	= 1	
Wearing coat thickness	= 0.056	m
Thickness of return wall	= 0.35	m
Bearing capacity of bed rock	= 300	KN/m^2
Foundation strata	Weathered rock	
Angle of Skew θ	= 0	Degree
Cos q ∓ Sin q 0 =		
Length of span skew	= 20.56	m
Length of abutment wall	= 13	m
Rare slope of stem wall with respect Vertical	= 0	Degree

Abutment Figure



SIDE VIEW OF ABUTMENT WALL A1

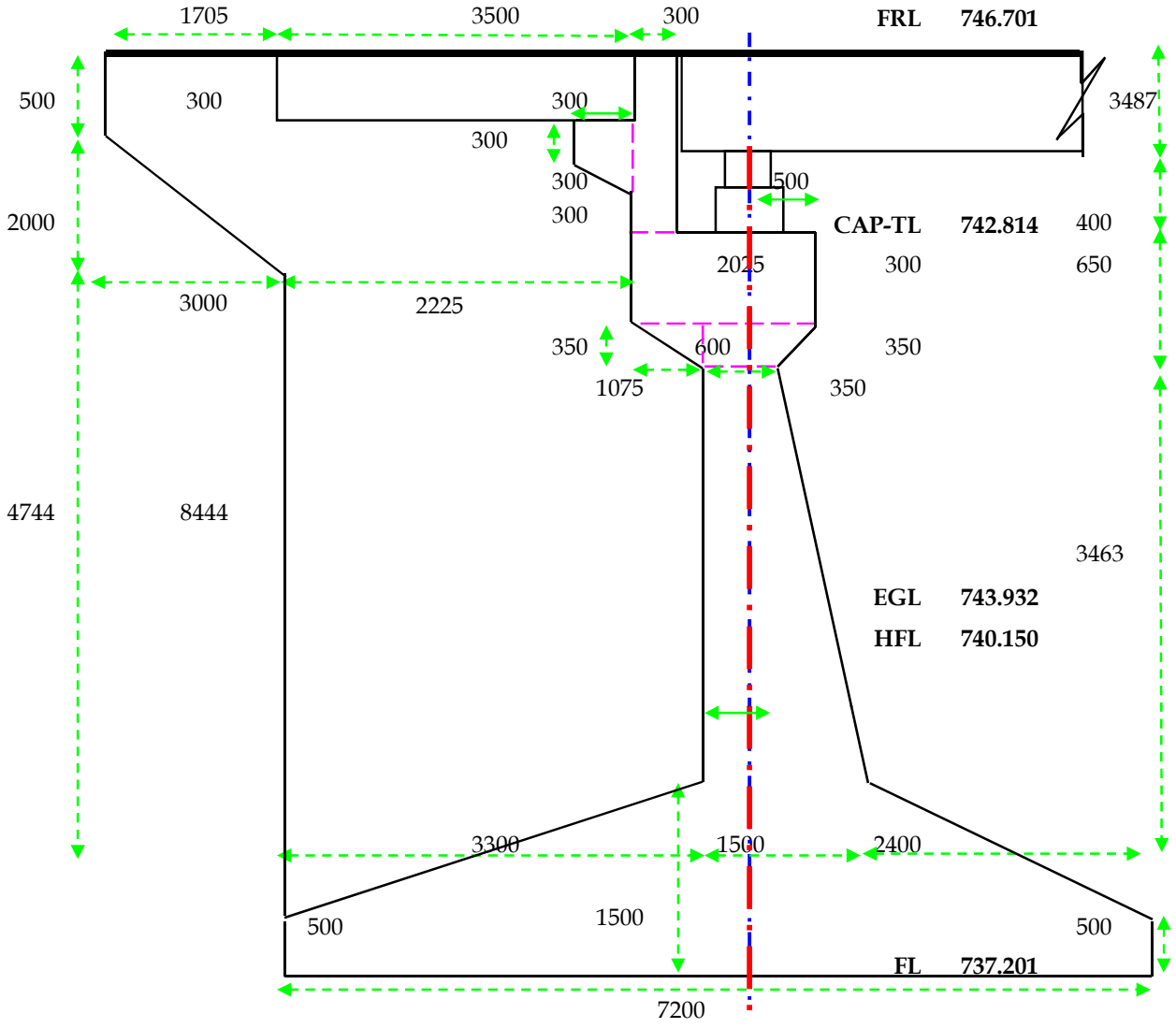
Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	Earthwork for footing						
	up to 3m height from top	Cum	1	10.080	16.080	3.000	486.26
	3m to 6m height from top	Cum	1	7.190	13.190	-0.110	-10.43
	6m & above from top	Cum	1	7.300	13.300	0.000	0.00
	Total quantity	Cum`					475.83
2	Lean concrete M15 PCC	Cum	1	7.300	13.300	0.150	14.56
3	M15 PCC over toe slab	Cum	1	13.300	2.200	1.000	29.26
4	Footing Slab M30	Cum	1	13.000	7.000	1.000	91.00
	M30 grade concrete for footing	Cum					91.000
	Steel @ 180 kg /Cum	MT					16.380

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
5	**Back fill with filter media**	Cum	1	11.500	0.600	6.244	**43.084**
6	**Back fill with granular media**	Cum	1	11.500	2.700	7.244	**224.926**
7	**Dirt Wall M30**	Cum	1	13.000	0.300	2.400	9.360
8	**Bracket of dirt wall M30**	Cum	1	13.000	0.300	0.450	1.755
9	**Bearing pedestal M30**	Cum	4	0.600	0.600	0.200	0.288
	Seismic arrestor-1 M30	Cum	3	0.500	0.400	1.420	0.852
	Seismic arrestor-2 M30	Cum	2	0.600	0.400	1.420	0.682
10	**Abutment Cap M30**						
	Haunch below dirt wall	Cum	1	13.000	0.990	0.300	1.931
	Full width cap	Cum	1	13.000	1.38	0.300	5.382
11	**Stem M30**	Cum	1	13.000	1.050	4.444	60.661
12	**Wing wall M30**						
	Top rectangular portion	Cum	2	2.450	0.350	0.500	0.858
	Bottom Triangular part	Cum	2	3.000	0.350	1.000	2.100
13	**Return wall M30**						
	Dirt wall part	Cum	2	2.970	0.500	2.700	8.019
	Cap part	Cum	2	3.135	0.500	0.300	0.941
	Stem Part	Cum	2	3.300	0.750	4.744	23.483
14	Front Counter fort	Cum	3	1.100	0.000	2.200	0.000
15	Rear counterfort	Cum	3	1.815	0.000	4.744	0.000
16	Return wall counterfort	Cum	4	1.125	0.000	6.244	0.000
	M30 grade concrete for Substructure	**Cum**					**116.31**
	Steel @ 180 kg /Cum	**MT**					**20.94**
17	**Weep hole**	No	1	78.00			78.00
18	**Bearing**						
	POT CUM PTFE	No	4			4.00	4.00
	Seismic arrestor	Cu cm	5	32.00	20.00	3.20	10240.00
19	**Expansion joint for 50mm**	Rm	1	13.00			13.00
20	**Premoulded expansion joint**	Rm	1	12.30			12.30
21	**Approach slab M30**	Cum	1	3.50	12.30	0.30	12.92
22	**PCC below approach slab M15**	Cum	1	3.65	3.50	0.15	1.92

QUANTITY CALCULATION FOR ABUTMENT WALL (A2)

Design Data:			
Number of spans	=	1	
Span Length	=	49.95	m
Centre to Centre of span length	=	48.00	m
Number of traffic lanes	=	2	
Overall width of carriageway	=	10.5	m
Overall width bridge	=	13.0	m
Road Crest Level	=	746.701	m
Percentage of camber	=	2.50	%
Depth of composite I girder	=	3.431	m
Vertical Clearance	=	3.064	m
Soffit level	=	743.214	m
Bottom Level of bearing (Top of pedastal)	=	743.014	m
Top level of abutment cap	=	742.814	m
Bottom of abutment cap	=	742.164	m
H.F.L	=	**740.150**	m
Scour level	=	**739.401**	m
Existing groung level	=	**743.932**	m
Abutment stem bottom Level	**=**	**738.701**	m
Foundation level	**=**	**737.201**	m
Number of main girders	=	4	
Width of cap excluding dirt wall	=	1.675	m
Length of bearing	=	0.8	m
Width of bearing	=	0.8	m
Thickness of bearing	=	0.2	m
Depth of bearing pedastal	=	0.2	m
Depth of abutment cap	=	0.65	m
Depth of abutment wall	=	3.463	m
Number of bearings per support	=	1	
Wearing coat thickness	=	0.056	m
Thickness of return wall	=	0.35	m
Bearing capacity of bed rock	=	300	KN/m^2
Foundation strata		Weathered rock	
Angle of Skew θ	=	0	Degree
Cos q ∓ Sin q 0 =			
Length of span skew	=	49.95	m
Length of abutment wall	=	13	m
Rare slope of stem wall with respect Vertical	=	0	Degree

Abutment Figure



SIDE VIEW OF ABUTMENT WALL A2

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	Earthwork for footing						
	up to 3m height from top	Cum	1	18.262	24.062	3.000	1318.26
	3m to 6m height from top	Cum	1	12.262	18.062	3.000	664.43
	6m & above from top	Cum	1	8.381	14.181	0.881	104.71
	Total quantity	Cum`					2087.40
2	Lean concrete M15 PCC	Cum	1	7.500	13.300	0.150	14.96
3	M15 PCC over toe slab	Cum	1	13.300	2.400	1.200	38.30
4	Footing Slab M30	Cum	1	13.000	7.200	1.000	93.60
	M30 grade concrete for footing	Cum					93.600
	Steel @ 180 kg /Cum	MT					16.848
5	Back fill with filter media	Cum	1	11.500	0.600	6.744	46.534

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
6	**Back fill with granular media**	Cum	1	11.500	2.700	7.744	**240.451**
7	**Dirt Wall M30**	Cum	1	13.000	0.300	3.831	14.941
8	**Bracket of dirt wall M30**	Cum	1	13.000	0.300	0.450	1.755
9	**Bearing pedestal M30**	Cum	4	0.800	0.800	0.200	0.512
	Seismic arrestor-1 M30	Cum	3	0.500	0.400	1.420	0.852
	Seismic arrestor-2 M30	Cum	2	0.600	0.400	1.420	0.682
10	**Abutment Cap M30**						
	Haunch below dirt wall	Cum	1	13.000	1.313	0.350	2.986
	Full width cap	Cum	1	13.000	2.025	0.300	7.898
11	**Stem M30**	Cum	1	13.000	1.050	3.463	47.270
12	**Wing wall M30**						
	Top rectangular portion	Cum	2	1.705	0.350	0.500	0.597
	Bottom Triangular part	Cum	2	3.000	0.350	1.000	2.100
13	**Return wall M30**						
	Dirt wall part	Cum	2	2.225	0.500	4.131	9.191
	Cap part	Cum	2	2.763	0.500	0.350	0.967
	Stem Part	Cum	2	3.300	0.750	5.244	25.958
14	Front Counter fort	Cum	3	1.200	0.000	2.400	0.000
15	Rear counterfort	Cum	3	2.188	0.000	3.813	0.000
16	Return wall counterfort	Cum	4	1.125	0.000	6.744	0.000
	M30 grade concrete for Substructure	**Cum**					**115.71**
	Steel @ 180 kg /Cum	**MT**					**20.83**
17	**Weep hole**	No	1	78.00			78.00
18	**Bearing**						
	POT CUM PTFE	No	4			4.00	4.0
	Seismic arrestor	Cu cm	5	32.00	20.00	3.20	10240.00
19	**Expansion joint for 50mm**	Rm	1	13.00			13.00
20	**Premoulded expansion joint**	Rm	1	12.30			12.30
21	**Approach slab M30**	Cum	1	3.50	12.30	0.30	12.92
22	**PCC below approach slab M15**	Cum	1	3.65	3.50	0.15	1.92

QUANTITY CALCULATION FOR PIER

Sr.No.	Description			Unit	Nos.	Length	Width	Depth	Quantity
1	**Earthwork for foundation**								
		OGL	**Footing Lvl**						
	Pier -1	736.486	732.387						
	Up to 3m height from top			Cum	1	13.00	16.80	3.00	655.02
	3m to 6m height from top			Cum	1	8.75	12.55	1.25	137.13
	6m & above from top			Cum	1	7.50	11.30	0.00	0.00
2	**Lean concrete M15 PCC**								
	Pier -1			Cum	1	7.50	11.30	0.5	42.38
	Total quantity			**Cum**					**42.38**
3	**PCC filling upto rock level**								
	Pier -1	PCC Filling		Cum	1	7.20	11.00	1.75	138.60
		Footing portion top		Cum	-1	4.60	8.40	1.25	-48.30
		Pier portion		Cum	-1	7.77		0.50	-3.88
	Total quantity			**Cum**					**86.42**
4	**Footing M30**								
	Pier -1	**Bottom portion**		Cum	1	7.20	11.00	0.75	59.4
		Top portion		Cum	1	4.60	8.40	1.25	48.3
	Total quantity			**Cum**					**107.700**
	Steel @ 200 kg /Cum			**MT**					**21.540**
5	**Stem M30**								
		Pier Bot level	**Pier Top level**						
	Pier -1	734.387	741.314						
		Section-1		Cum	1	7.767		6.93	53.803
6	**Pier Cap M30**								
	Pier -1								
	Top rectangular			Cum	1	11.170	3.000	0.750	12.57
	Bottom Trapezoidal			Cum	1	8.835	2.400	1.000	21.20
7	**Bearing pedestal M30**								
	Pier -1								
	RHS			Cum	4	0.800	0.800	0.200	0.51
	LHS			Cum	4	0.800	0.800	1.631	4.18
	Seismic arrestor-1 M30								
	RHS			Cum	3	0.500	0.000	1.374	0.00
	LHS			Cum	3	0.500	0.866	2.859	3.71
	Seismic arrestor-2 M30								
	RHS			Cum	2	0.600	0.400	1.374	0.66
	LHS			Cum	2	0.700	0.500	2.859	2.00
8	**M30 grade concrete for Substructure**			**Cum**					**98.64**
	Steel @ 220 kg /Cum			**MT**					**21.70**
9	**Bearing**			No					
	POT-CUM PTFE			No	8			8	8
	Seismic arrestor			Cu cm	10	32.00	20.00	3.20	20480.00
10	**Expansion joint for 50mm**			Rm	2	13.00			26.00

QUANTITY CALCULATION FOR SUPER STRUCTURE

Design Data: **No of span**

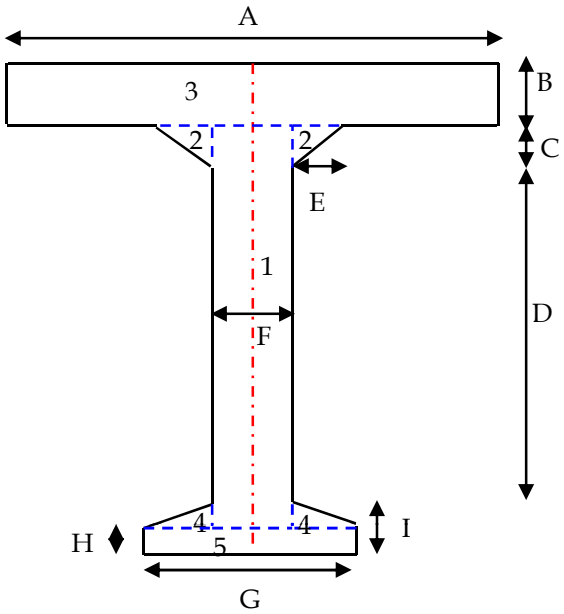
Span Length -Type-1	=	1	49.95	m
Span Length -Type-2	=	1	20.56	
Overall width of carriageway	=		10.5	m
Overall width bridge	=		13.0	m

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	**RCC Crash Barrier**	Rm	2	77.51	0.34	1.05	54.94
2	**Safety Kerb M40**	Cum	2	77.51	1.25	0.30	57.16
3	**Drainage spout**	No	2	15.00			30.00
4	**Wearing coat in Asphaltic concrete 56 mm thick**	Sqm	1	77.51	10.50		813.86
5	**50 m Span**						
a	**Main Girder RCC M45**						
	For end portion	Cum	2.00	3.65	2.725		19.90
	for tapered portion	Cum	2.00	2.75	2.036		11.20
	for middle portion	Cum	1.00	36.00	1.347		48.51
	Quantity per girder	Cum					79.60
	Total Quantity	Cum	4.00				318.42
	Deck Slab	Cum	1.00	48.800	13.000	0.266	168.43
	End Slab portion	Cum	2.00	0.575	13.000	0.445	6.65
b	**Cross girders M45**	Cum	3.000	8.190	0.300	2.660	19.61
c	**End Cross Girder M45**	Cum	2.000	6.580	0.450	2.750	16.29
	Total quantity for single span	**Cum**					**529.40**
	Total Nos of span	**Cum**	1.00				529.40
5	**20 m Span T beam**						
	Main Girder RCC M30 for 20 span						
a	**Inner Girder**						
	For end portion	Cum	4	1.780	1.839		13.09
	for tapered portion	Cum	4	1.625	1.644		10.69
	for middle portion	Cum	2	13.750	1.450		39.86
b	**Outer Girder**						
	For end portion	Cum	4	1.780	2.128		15.15
	for tapered portion	Cum	4	1.625	1.958		12.73
	for middle portion	Cum	2	13.750	1.789		49.19
c	**Cross girders M30**	Cum	3	7.449	1.263	0.325	9.17
d	**End Cross Girder M30**	Cum	2	6.552	1.263	0.325	5.38
	Total Quantity per span	Cum					155.27
	Total quantity for 20 m span	**Cum**	**1**				**155.27**
7	**Total Quantity M45 Concrete**	**Cum**					**529.40**
8	**Total Quantity M40 Concrete**	**Cum**					**112.10**
9	**Total Quantity M30 Concrete**	**Cum**					**155.27**
10	**Steel @ 180 kg /Cum for PSC & 160 kg/Cum for RCC**	**MT**					**112.76**
11	**Prestress steel @ 40 kg /Cum**	**MT**					**21.18**

Section properties RCC T-beam Girder for 20.00 m span

Second Moment of Inertia of girder for Running Section (Inner Girder)

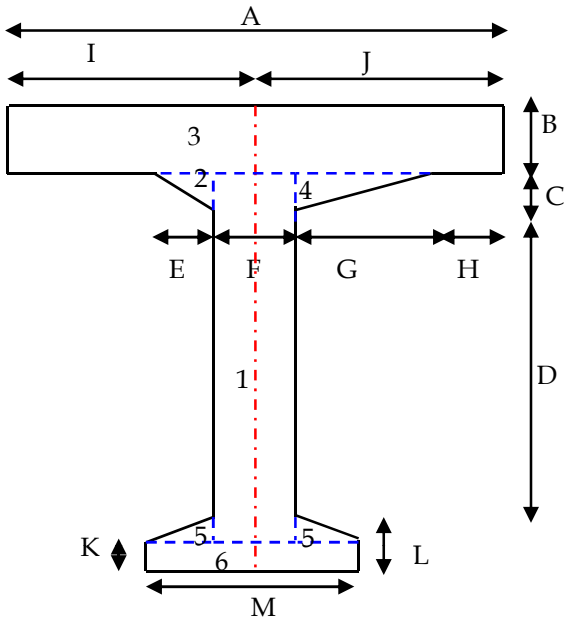
Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.325	1.485	0.482	0.992	0.479	0.475	0.08860
2	Top Hunch	0.300	0.150	0.045	1.685	0.076	0.128	0.000056
3	Top Flange	2.800	0.266	0.743	1.867	1.388	2.592	0.00437
4	Bottom Hunch	0.150	0.150	0.023	0.300	0.007	0.002	0.000028
5	Bottom Flange	0.625	0.250	0.156	0.125	0.020	0.002	0.00081
	Total			**1.450**		**1.969**	**3.199**	**0.094**



Depth of Girder		=	2.000	m
A =	2.800	**Y =**	1.359	m
B =	0.266	**I =**	3.293	m^4
C =	0.150	**I_z =**	0.616	m^4
D =	1.185	**Z_t =**	0.961	m^3
E =	0.300	**Z_b =**	0.46	m^3
F =	0.325	**A =**	1.450	m^2
G=	0.625			
H=	0.250			
I=	0.400			

Second Moment of Inertia of girder for Running Section (Outer Girder)

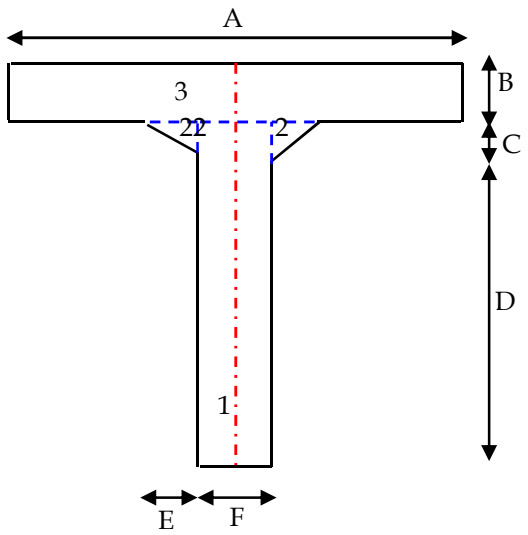
Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.325	1.485	0.482	0.992	0.479	0.475	0.088602
2	Top Hunch	0.300	0.150	0.023	1.685	0.038	0.064	0.000028
3	Top Flange	3.700	0.266	0.982	1.867	1.834	3.425	0.005771
4	Top Hunch	1.638	0.150	0.123	1.685	0.207	0.348	0.000154
5	Bottom Hunch	0.150	0.150	0.023	0.300	0.007	0.002	0.000028
6	Bottom Flange	0.625	0.250	0.156	0.125	0.020	0.002	0.000814
	Total			**1.789**	**6.654**	**2.584**	**4.317**	**0.095**



Depth of Girder		=	2.000	m
A =	3.700	**Y =**	1.445	m
B =	0.266	**I =**	4.413	m^4
C =	0.150	**I_z =**	0.678	m^4
D =	1.185	**Z_t =**	1.222	m^3
E =	0.300	**Z_b =**	0.47	m^3
F =	0.325	**A =**	1.789	m^2
G =	1.638			
H =	0.500	**K =**	0.250	
I =	1.400	**L =**	0.400	
J =	2.300	**M =**	0.625	

Second Moment of Inertia of girder for Support Section (Inner Girder)

Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.625	1.735	1.084	0.867	0.940	0.815	0.271783
2	Top Hunch	0.150	0.075	0.011	1.710	0.019	0.033	0.000004
3	Top Flange	2.800	0.266	0.743	1.867	1.388	2.592	0.004367
	Total			**1.839**	**4.444**	**2.347**	**3.440**	**0.276153**

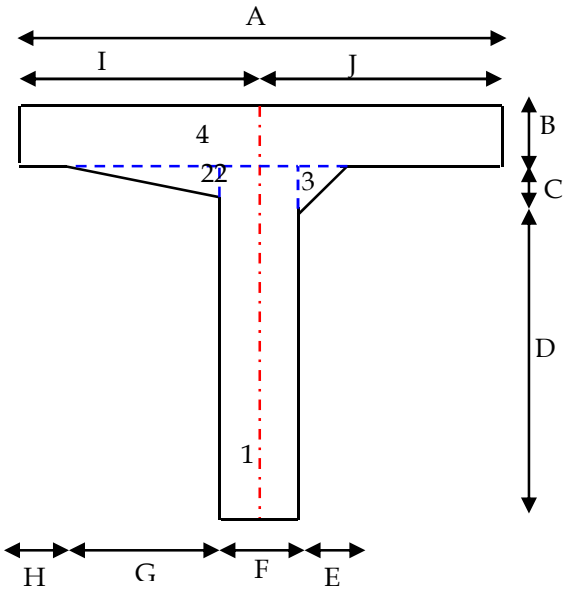


Depth of Girder = 2.000 m

A =	2.800	**Y =**	1.277 m
B =	0.266	**I =**	3.717 m^4
C =	0.075	**I_z =**	0.719 m^4
D =	1.660	**Z_t =**	0.995 m^3
E =	0.15	**Z_b =**	0.57 m^3
F =	0.625	**A =**	1.839 m^2

Second Moment of Inertia of girder for Support Section (Outer Girder)

Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.625	1.735	1.084	0.867	0.940	0.815	0.271783
2	Top Hunch	1.488	0.075	0.056	1.710	0.095	0.163	0.000017
3	Top Hunch	0.150	0.075	0.006	1.710	0.010	0.016	0.000002
4	Top Flange	3.700	0.266	0.982	1.867	1.834	3.425	0.005771
	Total			**2.128**		**2.879**	**4.420**	**0.277572**

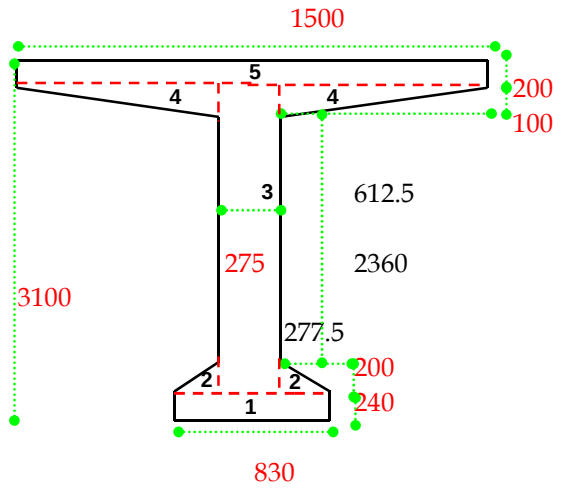


Depth of Girder = 2.000 m

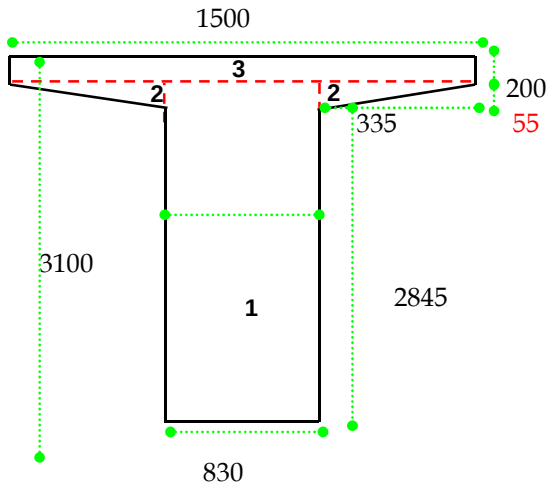
A =	3.700	**I =**	2.300
B =	0.266	**J =**	1.400
C =	0.075	**Y =**	1.354 m
D =	1.660	**I =**	4.698 m^4
E =	0.15	**I_z =**	0.798 m^4
F =	0.625	**Z_t =**	1.236 m^3
G =	1.4875	**Z_b =**	0.59 m^3
H =	0.500	**A =**	2.128 m^2

SECTION PROPERTY FOR 48.0 M SPAN

1 Running Section



2 Support Section



Second Moment of Inertia of girder for Running Section

Sr.No	Description	Length in mm	Depth in mm	Area mm^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Bottom Flange	830	240	1.99E+05	1.20E+02	2.39E+07	2.87E+09	9.56E+08
2	Bottom Hunch	277.5	200	5.55E+04	3.07E+02	1.70E+07	5.22E+09	1.23E+08
3	Web	275	2660	7.32E+05	1.57E+03	1.15E+09	1.80E+12	4.31E+11
4	Top Hunch	612.5	100	6.13E+04	2.87E+03	1.76E+08	5.03E+11	3.40E+07
5	Top Flange	1500	200	3.00E+05	3.00E+03	9.00E+08	2.70E+12	1.00E+09
				1.35E+06	**7.86E+03**	**2.26E+09**	**5.01E+12**	**4.33E+11**

Depth of Girder	=	3100.00	mm	3.100 m
Area **A**	=	1347450.00	mm^2	1.347 m^2
CG from bottom **Y**	=	1680.92	mm	1.681 m
$I = AY^2 + Iself$	=	5.45E+12	mm^4	5.448 m^4
$Iz=I- AxY^2$	=	1.64E+12	mm^4	1.641 m^4

Second Moment of Inertia of girder for Support Section

Sr.No	Description	Length in mm	Depth in mm	Area mm^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Bottom Flange	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	Bottom Hunch	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1	Web	830	2900	2.41E+06	1.45E+03	3.49E+09	5.06E+12	1.69E+12
2	Top Hunch	335.0	55	1.84E+04	2.88E+03	5.31E+07	1.53E+11	3.10E+06
3	Top Flange	1500	200	3.00E+05	3.00E+03	9.00E+08	2.70E+12	1.00E+09
				2.73E+06	**7.33E+03**	**4.44E+09**	**7.91E+12**	**1.69E+12**

Depth of Girder	=	3100.00	mm	3.100 m
Area **A**	=	2725425.00	mm^2	2.725 m^2
CG from bottom **Y**	=	1630.29	mm	1.630 m
$I = AY^2 + Iself$	=	9.60E+12	mm^4	9.602 m^4
$Iz=I- AxY^2$	=	2.36E+12	mm^4	2.358 m^4

COST ESTIMATE OVER BRIDGE NO-66+695		
Sr. No.	**Description**	**Amount (Rs)**
	Span Arrangement = 1X15+1X90+1X15	
1	**Foundation**	**22,045,361.29**
2	**Sub Structure**	**19,897,111.03**
3	**Super Structure**	**76,861,510.79**
4	**Launching & Erection @ 25% of 3**	**19,215,377.70**
5	**Carriage of Material**	**1,587,048.32**
	Grand Total	**139,606,409.13**
	Say	**139,607,000.00**

(Rupees thirteen crore ninety six lakh seven thousand) only

ESTIMATE COST FOR BRIDGE NO-08

Item No.	SOR ref	Description	Unit	Rate (Rs)	Quantity	Amount (Rs)
A		**Foundation**				
1.0	**12.1 -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				
	I	**Ordinary soil (Manual Means)**				
		(i) Depth upto 3 m	Cum	173.00	8084.78	1398666.87
		(ii) 3 m to 6 m depth	Cum	222.00	4832.77	1072875.12
	III	Hard rock (requiring blasting)	Cum	613.00	3354.11	2056069.65
2.0	12.8-A	Providing and laying of PCC M 15 levelling course 150 mm thick below the foundation	Cum	6,824.00	64.83	442399.92
3.0		Providing and laying of PCC M 15 in toe portion below SDR Level	Cum	6,824.00	229.57	1566586.50
4.0	12.8-G	Plain/Reinforced cement concrete M30 in open foundation for abutment wall complete as per drawing and technical specifications	Cum	8,522.00	619.65	5280657.30
5.0	12.40	Supplying, fitting and placing uncoated HYSD bar reinforcement in foundation complete as per drawing and Technical specifications	MT	84,490.00	121.06	10228105.93
		Total Foundation				**22045361.29**
B		**Sub Structure**				
1.00	13.5	Plain/Reinforced Cement Concrete in open foundation complete as per Drawing and Technical specifications				
	G-(p)-C-I	a)RCC Grade M 30 upto 5 m	Cum	9,058.00	202.72	1836251.59
	G-(q)-C-I	b)RCC Grade M 30 above 5 m and upto 10 m	Cum	9,313.00	202.72	1887945.58
	G-(r)-C-I	c)RCC Grade M 30 above 10 m	Cum	9,675.00	270.30	2615107.69
2.00	13.6	Supplying, fitting and placing uncoated HYSD bar reinforcement in substructure complete as per drawing and Technical specifications	MT	84,689.00	141.10	11949906.78
3.00	13.8	Providing weep holes in stone 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 foce. Complete as per drawing and Technical Specifications	Nos	2,033.00	156.00	317148.00
4.00	13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification (A. Granular material)	Cum	1,251.00	358.58	448582.58
5.00	13.10	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the rerquirements laid down in clause 2504.2.2 of MOSRT&H specifications to a thickness of not less than 600mm with smaller size towards the soil and bigger size towards the wall and provided over the enire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical specifications	Cum	1,291.00	77.91	100588.01

Item No.	SOR ref	Description	Unit	Rate (Rs)	Quantity	Amount (Rs)
6.00	13.16	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.	cubic centim etre	1.42	522240.00	741580.80
		Total Sub Structure				**19897111.03**
C		**Super Structure**				
1.00	14.1	Furnishing and placing reinforced/Prestressed cement concrete in superstructure as per drawing and Technical specifications				
	C(ii)(r)C1	RCC Grade M 30	Cum	11,160.00	436.43	4870532.29
	E(iii)(r)C1	RCC Grade M 40	Cum	60,120.00	709.63	42662721.43
2.00	14.2	Supplying, fitting and placing HYSD bar reinforcement in superstructure complete as per drawing and Technical specifications	MT	86,265.00	252.13	21750151.49
3.00	14.3	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	MT	200095.00	28.39	5679705.42
4.00	14.5	Providing and laying 56mm 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 reqired level and slope after cleaning the surface including providing anti-skid surface with bitumen precoated fine grained hard stone chipping of 9.50mm nominal size at the rate of 0.005 cum per 10 Sqm ans 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 C protuding 1mm to 4mm over mastiv surfaces all complete as per clause 515.	SQM	484.00	1343.79	650394.36
5.00	14.9	Drainage spouts complete as per drawing and Technical Specifications	Nos	2063.00	50.00	103150.00
6.00	14.10	PCC M 15 grade levelling course below approach slab complete as per drawing and Technical	Cum	6563.00	3.83	25152.70
7.00	14.11	Reinforced cement concrete approach slab in RCC M 30 grade including reinforcement and form work complete as per drawing and Technical specifications	Cum	12210.00	25.83	315384.30
8.00	14.18-(iii)	Providing and fixing in position 20mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10m to cater for a horizontal movement upto 20mm covered with sealant complete as per drawing and Technical specifications	RM	198.00	24.60	4870.80
9.00	14.22	Providing nad laying of a strip seal expansion joint catering to maximum horizontal movement upto 70mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring	RM	15374.00	52.00	799448.00
		Total Super Structure				**76861510.79**

Carriage of Materials

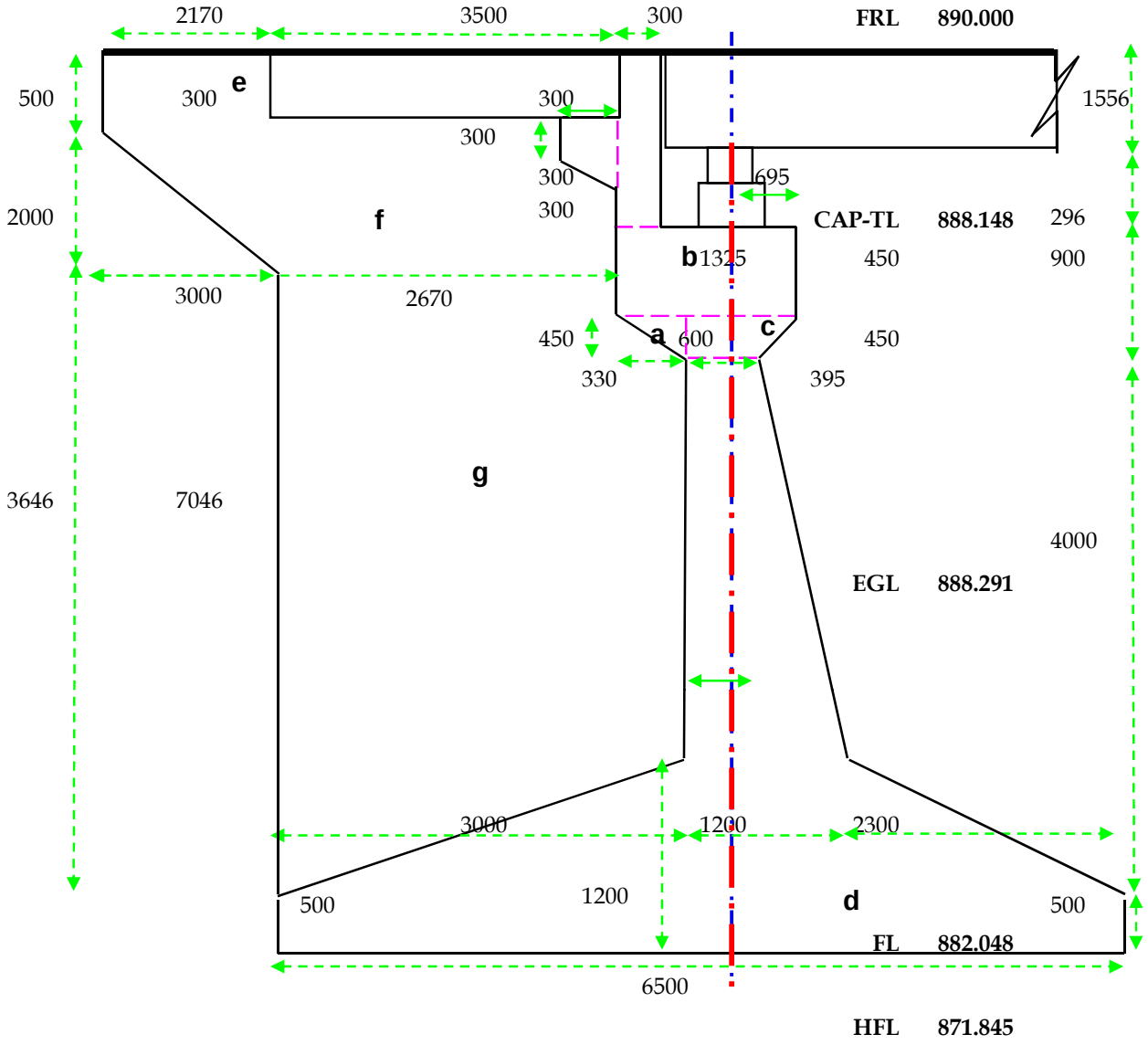
Sr.No.	SOR reference	Description	Unit	Unit of requirement	Total quantity	Unit weight	Carriage distance	Quantity	Rate in Rs	Amount in Rs
1.0	**1.1**	**Loading and unloading of stone boulder/stone aggregates/sand**								
a		**Loading and unloading of stone aggregates**								
		M15 grade concrete	**Cum**	0.89	298.23			265.43	105.00	27869.84
		M30 grade concrete	**Cum**	0.90	1757.65			1581.88	105.00	166097.55
		M40 grade concrete	**Cum**	0.90	709.63			638.66	105.00	67059.67
b		**Loading and unloading of sand**								
		M15 grade concrete	**Cum**	0.445	298.23			132.71	105.00	13934.92
		M30 grade concrete	**Cum**	0.450	1757.65			790.94	105.00	83048.78
		M40 grade concrete	**Cum**	0.450	709.63			319.33	105.00	33529.83
c	**1.3**	**Loading and unloading of cement by manual means and stacking**								
		M15 grade concrete	**Tonne**	0.320	298.23			95.43	215.00	20518.40
		M30 grade concrete	**Tonne**	0.420	1757.65			738.21	215.00	158715.44
		M40 grade concrete	**Tonne**	0.450	709.63			319.33	215.00	68656.33
		Steel	**Tonne**	1.050	514.29			540.01	215.00	116101.47
2.0	**1.4**	**Cost of Haulage Excluding Loading and Unloading**								
	(i)	**Surfaced Road**								
		a) Cement	**Ton. km**				135.00	95.43	6.70	86320.45
		b) Stone Aggregates	**Ton. km**				55.00	265.43	6.70	97809.86
		c) Sand	**Ton. km**				55.00	132.71	6.70	48904.93
		d) Steel	**Ton. km**				135.00	540.01	6.70	488436.19

Sr.No.	SOR reference	Description	Unit	Unit of requirement	Total quantity	Unit weight	Carriage distance	Quantity	Rate in Rs	Amount in Rs
	(ii)	**Unsurface road**								
		a) Cement	**Ton. km**				0.00	95.43	8.40	0.00
		b) Stone Aggregates	**Ton. km**			1.74	2.00	265.43	8.40	7758.96
		c) Sand	**Ton. km**			1.84	2.00	132.71	8.40	4102.44
		d) Steel	**Ton. km**				0.00	540.01	8.40	0.00
2.0		**Wearing coat**								
a	**1.1**	Loading and unloading of stone aggregates	**Cum**	0.0135				97.374	105.00	10224.24
b	**1.1**	Loading and unloading of Lime stone dust filler with calcium carbonate	**Cum**	0.0050				36.064	105.00	3786.76
c	**1.3**	Loading/Unloading & Carriage cost of Bitument for wearing coat	**Tonnes**	0.0028				20.196	215.00	4342.15
	1.4	Cost of Haulage Excluding Loading and Unloading								
	(i)	**Surface road**								
a		Bitumens	**Ton. km**				135.00	20.20	6.70	18267.31
b		Line stone dust	**Ton. km**			1.80	135.00	36.06	6.70	58716.37
	(ii)	**Unsurface road**								
a		Bitumens	**Ton. km**				0.00	36.06	8.40	0.00
b		Stone Aggregates	**Ton. km**			1.74	2.00	97.374	8.40	2846.43
c		Lime stone dust	**Ton. km**			1.80	0.00	36.064	8.40	0.00
		Grand Total cost for carriage of material								**1587048.32**

QUANTITY CALCULATION FOR ABUTMENT WALL (A1)

Design Data:		
Number of spans	= 1	
Span Length	= 15.56	m
Centre to Centre of span length	= 15.00	m
Number of traffic lanes	= 2	
Overall width of carriageway	= 10.5	m
Overall width bridge	= 13.00	m
Road Crest Level	= 890.000	m
Percentage of camber	= 2.50	%
Depth of T Beam girder	= 1.500	m
Vertical Clearance	= 16.599	m
Soffit level	= 888.444	m
Bottom Level of bearing (Top of pedastal)	= 888.244	m
Top level of abutment cap	= 888.148	m
Bottom of abutment cap	= 887.248	m
H.F.L	= **871.845**	m
Scour level	= **884.048**	m
Existing groung level	= **888.291**	m
Abutment stem bottom Level	**= 883.248**	m
Foundation level	**= 882.048**	m
Number of main girders	= 4	
Width of cap excluding dirt wall	= 1.025	m
Length of bearing	= 0.5	m
Width of bearing	= 0.4	m
Thickness of bearing	= 0.2	m
Depth of bearing pedastal	= 0.096	m
Depth of abutment cap	= 0.9	m
Depth of abutment wall	= 4.000	m
Number of bearings per support	= 1	
Wearing coat thickness	= 0.056	m
Thickness of return wall	= 0.35	m
Bearing capacity of bed rock	= 400	KN/m^2
Foundation strata	Weathered rock	
Angle of Skew θ	= 0	Degree
Cos q ∓ Sin q 0 =		
Length of span skew	= 15.56	m
Length of abutment wall	= 13	m
Rare slope of stem wall with respect Vertical	= 0	Degree

Abutment Figure



SIDE VIEW OF ABUTMENT WALL A1

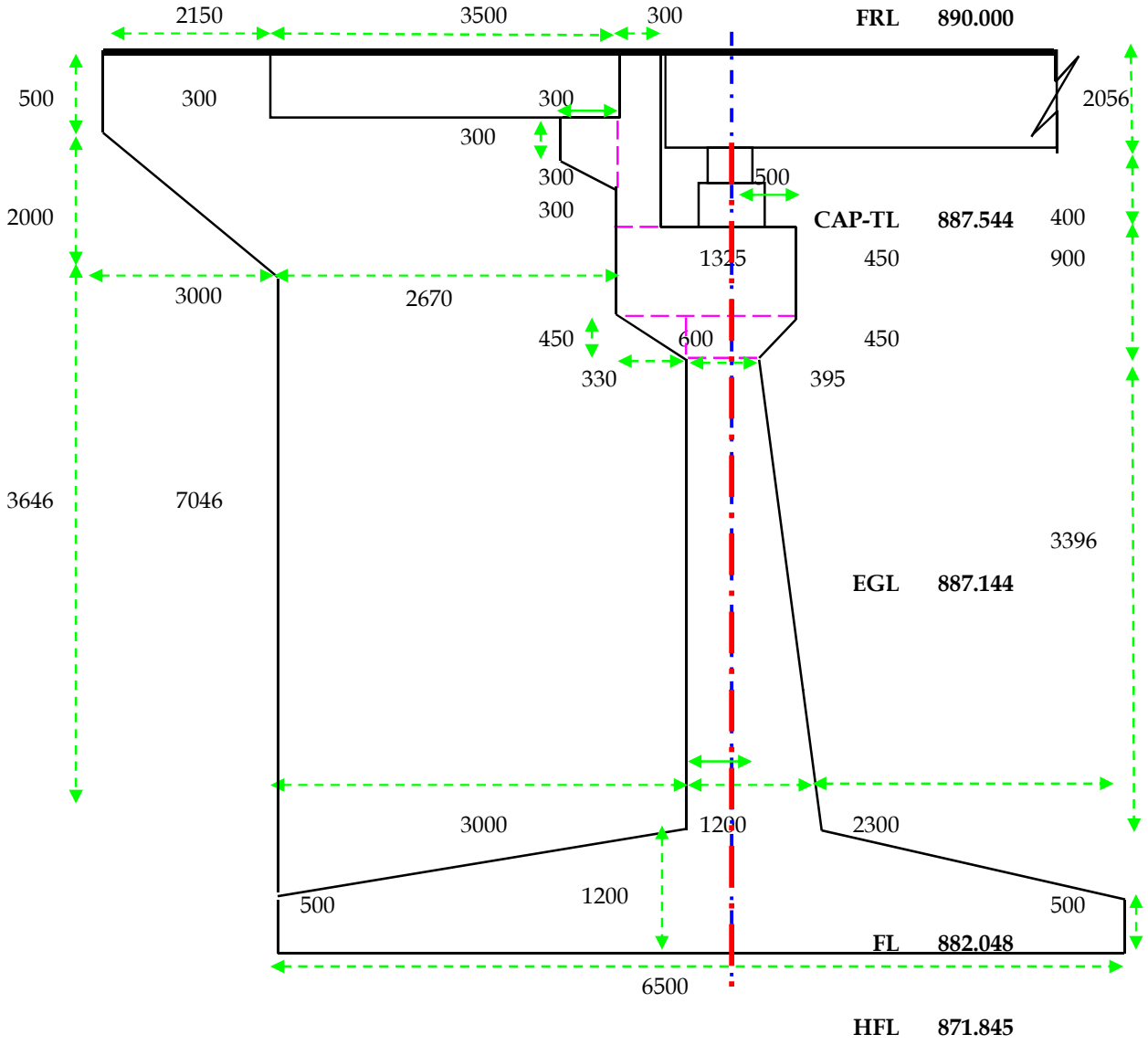
Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	Earthwork for footing						
	up to 3m height from top	Cum	1	16.586	23.086	3.000	1148.71
	3m to 6m height from top	Cum	1	10.586	17.086	3.000	542.62
	6m & above from top	Cum	1	7.193	13.693	0.393	38.71
	Total quantity	Cum`					1730.04
2	Lean concrete M15 PCC	Cum	1	6.800	13.300	0.150	13.57
3	M15 PCC over toe slab	Cum	1	13.300	2.300	1.150	35.18
4	Footing Slab M30	Cum	1	13.000	6.500	0.850	71.83
	M30 grade concrete for footing	Cum					71.825
	Steel @ 180 kg /Cum	MT					12.929

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
5	**Back fill with filter media**	Cum	1	11.500	0.600	5.646	**38.957**
6	**Back fill with granular media**	Cum	1	11.500	2.400	6.496	**179.290**
7	**Dirt Wall M30**	Cum	1	13.000	0.300	1.796	7.004
8	**Bracket of dirt wall M30**	Cum	1	13.000	0.300	0.450	1.755
9	**Bearing pedestal M30**	Cum	4	0.500	0.400	0.096	0.077
	Seismic arrestor-1 M30	Cum	3	0.500	0.400	1.420	0.852
	Seismic arrestor-2 M30	Cum	2	0.600	0.400	1.420	0.682
10	**Abutment Cap M30**						
	Haunch below dirt wall	Cum	1	13.000	0.963	0.450	2.815
	Full width cap	Cum	1	13.000	1.325	0.450	7.751
11	**Stem M30**	Cum	1	13.000	0.900	4.000	46.800
12	**Wing wall M30**						
	Top rectangular portion	Cum	2	2.170	0.350	0.500	0.760
	Bottom Triangular part	Cum	2	3.000	0.350	1.000	2.100
13	**Return wall M30**						
	Dirt wall part	Cum	2	2.670	0.500	2.246	5.997
	Cap part	Cum	2	2.835	0.500	0.450	1.276
	Stem Part	Cum	2	3.000	0.750	3.996	17.982
	M30 grade concrete for Substructure	**Cum**					**95.85**
	Steel @ 180 kg /Cum	**MT**					**17.25**
14	**Weep hole**	No	1	78.00			78.00
15	**Bearing**						
	ELASTOMERIC Bearing	Cu cm	4	50.00	40.00	9.60	76800.00
	Seismic arrestor	Cu cm	5	32.00	20.00	3.20	10240.00
16	**Expansion joint for 50mm**	Rm	1	13.00			13.00
17	**Premoulded expansion joint**	Rm	1	12.30			12.30
18	**Approach slab M30**	Cum	1	3.50	12.30	0.30	12.92
19	**PCC below approach slab M15**	Cum	1	3.65	3.50	0.15	1.92

QUANTITY CALCULATION FOR ABUTMENT WALL (A2)

Design Data:			
Number of spans	=	1	
Span Length	=	15.56	m
Centre to Centre of span length	=	15.00	m
Number of traffic lanes	=	2	
Overall width of carriageway	=	10.5	m
Overall width bridge	=	13.0	m
Road Crest Level	=	890.000	m
Percentage of camber	=	2.50	%
Depth of T Beam girder	=	2.000	m
Vertical Clearance	=	16.099	m
Soffit level	=	887.944	m
Bottom Level of bearing (Top of pedastal)	=	887.744	m
Top level of abutment cap	=	887.544	m
Bottom of abutment cap	=	886.644	m
H.F.L	=	**871.845**	m
Scour level	=	**884.048**	m
Existing groung level	=	**887.144**	m
Abutment stem bottom Level	**=**	**883.248**	m
Foundation level	**=**	**882.048**	m
Number of main girders	=	4	
Width of cap excluding dirt wall	=	1.025	m
Length of bearing	=	0.5	m
Width of bearing	=	0.4	m
Thickness of bearing	=	0.2	m
Depth of bearing pedastal	=	0.2	m
Depth of abutment cap	=	0.9	m
Depth of abutment wall	=	3.396	m
Number of bearings per support	=	1	
Wearing coat thickness	=	0.056	m
Thickness of return wall	=	0.35	m
Bearing capacity of bed rock	=	400	KN/m^2
Foundation strata		Weathered rock	
Angle of Skew θ	=	0	Degree
Cos q ∓ Sin q 0 =			
Length of span skew	=	15.56	m
Length of abutment wall	=	13	m
Rare slope of stem wall with respect Vertical	=	0	Degree

Abutment Figure



SIDE VIEW OF ABUTMENT WALL A2

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	Earthwork for footing						
	up to 3m height from top	Cum	1	14.292	20.792	3.000	891.48
	3m to 6m height from top	Cum	1	9.046	15.546	2.246	315.85
	6m & above from top	Cum	1	6.800	13.300	0.000	0.00
	Total quantity	Cum`					1207.33
2	Lean concrete M15 PCC	Cum	1	6.800	13.300	0.150	13.57
3	M15 PCC over toe slab	Cum	1	13.300	2.300	1.150	35.18
4	Footing Slab M30	Cum	1	13.000	6.500	0.850	71.83
	M30 grade concrete for footing	Cum					71.825
	Steel @ 180 kg /Cum	MT					12.929
5	Back fill with filter media	Cum	1	11.500	0.600	5.646	38.957

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
6	**Back fill with granular media**	Cum	1	11.500	2.400	6.496	**179.290**
7	**Dirt Wall M30**	Cum	1	13.000	0.300	2.400	9.360
8	**Bracket of dirt wall M30**	Cum	1	13.000	0.300	0.450	1.755
9	**Bearing pedestal M30**	Cum	4	0.500	0.400	0.200	0.160
	Seismic arrestor-1 M30	Cum	3	0.500	0.400	1.420	0.852
	Seismic arrestor-2 M30	Cum	2	0.600	0.400	1.420	0.682
10	**Abutment Cap M30**						
	Haunch below dirt wall	Cum	1	13.000	0.963	0.450	2.815
	Full width cap	Cum	1	13.000	1.325	0.450	7.751
11	**Stem M30**	Cum	1	13.000	0.900	3.396	39.733
12	**Wing wall M30**						
	Top rectangular portion	Cum	2	3.000	0.350	0.500	1.050
	Bottom Triangular part	Cum	2	3.000	0.350	1.000	2.100
13	**Return wall M30**						
	Dirt wall part	Cum	2	2.670	0.500	2.850	7.610
	Cap part	Cum	2	2.835	0.500	0.450	1.276
	Stem Part	Cum	2	3.000	0.750	3.996	17.982
	M30 grade concrete for Substructure	**Cum**					**93.13**
	Steel @ 180 kg /Cum	**MT**					**16.76**
14	**Weep hole**	No	1	78.00			78.00
15	**Bearing**						
	ELASTOMERIC Bearing	Cu cm	4	50.00	40.00	9.60	76800.00
	Seismic arrestor	Cu cm	5	32.00	20.00	3.20	10240.00
16	**Expansion joint for 50mm**	Rm	1	13.00			13.00
17	**Premoulded expansion joint**	Rm	1	12.30			12.30
18	**Approach slab M30**	Cum	1	3.50	12.30	0.30	12.92
19	**PCC below approach slab M15**	Cum	1	3.65	3.50	0.15	1.92

QUANTITY CALCULATION FOR PIER

Sr.No.	Description			Unit	Nos.	Length	Width	Depth	Quantity
1	**Earthwork for foundation**								
		OGL	Footing Lvl						
	Pier -1	880.462	868.794						
	Up to 3m height from top			Cum	1	30.936	32.836	3.000	3047.44
	3m to 6m height from top			Cum	1	24.936	26.836	3.000	2007.55
	6m & above from top			Cum	1	16.118	18.018	5.818	1689.63
	Pier -2	880.330	868.794						
	Up to 3m height from top			Cum	1	30.672	32.572	3.000	2997.15
	3m to 6m height from top			Cum	1	24.672	26.572	3.000	1966.75
	6m & above from top			Cum	1	15.986	17.886	5.686	1625.77
2	**Lean concrete M15 PCC**								
	Pier -1			Cum	1	10.30	12.20	0.15	18.85
	Pier -2			Cum	1	10.30	12.20	0.15	18.85
	Total quantity			**Cum**					**37.70**
3	**PCC filling upto rock level**								
	Pier -1	PCC filling		Cum	1	10.00	11.90	1.50	178.50
		Deduction pier		Cum	-1				-98.89
	Pier -2	PCC filling		Cum	1	10.00	11.90	1.50	178.50
		Deduction pier		Cum	-1				-98.89
	Total quantity			**Cum**					**159.21**
4	**Footing M30**								
	Pier -1	**Bottom portion**		Cum	1	10.00	11.90	2.00	238.00
	Pier -2	**Bottom portion**		Cum	1	10.00	11.90	2.00	238.00
	Total quantity			**Cum**					**476.00**
	Steel @ 200 kg/Cum			**MT**					**95.20**
5	**Stem M30**								
		Pier Bot level	**Pier Top level**						
	Pier -1	870.794	886.398						
		Section-1		Cum	1	7.017		7.50	52.629
		Section-2		Cum	1	10.142		5.98	60.647
		End block		Cum	1	9.700	4.80	2.12	98.893
	Pier -2	870.794	892.726						
		Section-1		Cum	1	7.017		7.50	52.629
		Section-2		Cum	1	10.142		5.98	60.647
		End block		Cum	1	9.700	4.80	2.12	98.893
6	**Pier Cap M30**								
	Pier -1								
	Top rectangular			Cum	1	11.170	2.300	0.750	9.63
	Bottom Trapezoidal			Cum	1	8.835	2.050	1.000	18.11
	Pier -2								
	Top rectangular			Cum	1	11.170	2.300	0.750	9.63
	Bottom Trapezoidal			Cum	1	8.835	2.050	1.000	18.11
7	**Bearing pedestal M30**								
	Pier -1								
	RHS			Cum	4	0.700	0.600	0.200	0.34
	LHS			Cum	4	0.700	0.600	0.200	0.34
	Seismic arrestor-1 M30								
	RHS			Cum	3	0.500	0.400	1.316	0.79
	LHS			Cum	3	0.500	0.400	1.316	0.79
	Seismic arrestor-2 M30								

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
	RHS	Cum	2	0.600	0.400	1.316	0.63
	LHS	Cum	2	0.600	0.400	1.316	0.63
	Pier -2						
	RHS	Cum	4	0.600	0.600	0.200	0.29
	LHS	Cum	4	0.600	0.600	0.200	0.29
	Seismic arrestor-1 M30						
	RHS	Cum	3	0.500	0.400	1.316	0.79
	LHS	Cum	3	0.500	0.400	1.316	0.79
	Seismic arrestor-2 M30						
	RHS	Cum	2	0.600	0.400	1.316	0.63
	LHS	Cum	2	0.600	0.400	1.316	0.63
8	**M30 grade concrete for Substructure**	**Cum**					**486.76**
	Steel @ 220 kg /Cum	**MT**					**107.09**
9	**Bearing**						
	ELASTOMERIC BEARING	Cu cm	16	50	40	10	307200.00
	Seismic arrestor	Cu cm	20	32.00	20.00	3.20	40960.00
10	**Expansion joint for 50mm**	Rm	2	13.00			26.00

QUANTITY CALCULATION FOR SUPER STRUCTURE

Design Data: **No of span**

Span Length -Type-1	=	1	89.86	m
Span Length -Type-2	=	2	15.56	
Overall width of carriageway	=		10.5	m
Overall width bridge	=		13.0	m

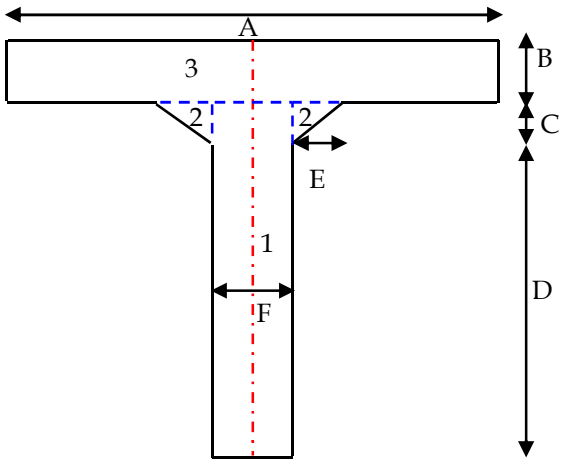
Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	**RCC Crash Barrier M40**	Rm	2	127.98	0.34	1.05	90.71
2	**Safety Kerb M40**	Cum	2	127.98	1.25	0.30	94.39
3	**Drainage spout**	No	2	25.00			50.00
4	**Wearing coat in Asphaltic concrete 56 mm thick**	Sqm	1	127.98	10.50		1343.79
5	**Rib**						
a	**Main Girder RCC M40**						
	Main Rib mid portion	Cum	4.00	76.900	0.900	1.000	276.84
	Main Rib Support portion	Cum	8.00	14.900	0.900	1.375	147.51
	Cross beam-1 (Connecting to Rib)	Cum	21.00	1.900	0.600	0.600	14.36
	Cross beam-2 (Connecting to Pier-1)	Cum	2.00	5.700	1.050	1.386	16.59
	Cross beam-3(Connecting to Pier-2)	Cum	2.00	5.700	1.050	1.145	13.71
b	**Pier on arch Rib**						
	Pier on arch Rib-1	Cum	8.00	0.900	0.900	6.745	43.71
	Cross beam	Cum	3.00	1.900	0.600	0.600	2.05
	Pier on arch Rib-2	Cum	8.00	0.900	0.900	1.507	9.77
	Total quantity for single span	**Cum**					**524.54**
	Total Nos of span	**Cum**	**1**				**524.54**
6	**15 m Span T beam End span**						
	Main Girder RCC M30 for 15 span						
a	**Inner Girder**						
	For end portion	Cum	2	0.980	1.526		2.991
	for tapered portion	Cum	2	0.900	1.358		2.444
	for middle portion	Cum	1	11.800	1.190		14.037
b	**Outer Girder**						
	For end portion	Cum	2	0.980	1.815		3.558
	for tapered portion	Cum	2	0.900	1.672		3.010
	for middle portion	Cum	1	11.800	1.529		18.041
c	**Cross girders M30**	Cum	1	7.425	0.325	0.769	1.856
d	**End Cross Girder M30**	Cum	2	6.525	0.325	0.769	3.262
	Total Quantity per span	Cum					49.199
	Total quantity for 15 m span	**Cum**	**2**				**98.398**
7	**Span-1 (End Span)**						
a	**Inner Girder**						
	For end portion at start	Cum	1	0.980	1.526		1.496
	For end portion at end	Cum	1	0.850	1.526		1.297
	For tapered portion	Cum	2	0.900	1.358		2.444
	For middle portion	Cum	1	11.650	1.190		13.859
b	**Outer Girder**						
	For end portion at start	Cum	1	0.980	1.815		1.779
	For end portion at end	Cum	1	1.500	1.815		2.723
	For tapered portion	Cum	2	0.900	1.672		3.010
	For middle portion	Cum	1	11.650	1.529		17.811
c	**Cross girders M30**	Cum	3	7.449	0.325	0.769	5.585
d	**End Cross Girder M30**	Cum	1	6.552	0.325	0.769	1.638

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
	Total Quantity per span	Cum					51.642
	Total quantity for 15 m span	**Cum**	**2**				**103.284**
8	**Span-2 (Intermediate Span)**						
a	**Inner Girder**						
	For end portion	Cum	2	0.850	1.526		2.595
	For tapered portion	Cum	2	0.900	1.358		2.444
	For middle portion	Cum	1	11.500	1.190		13.681
b	**Outer Girder**						
	For end portion	Cum	2	0.850	1.815		3.086
	For tapered portion	Cum	2	0.900	1.672		3.010
	For middle portion	Cum	1	11.500	1.529		17.582
c	**Cross girders M30**	Cum	1	7.449	0.325	1.269	3.072
d	**End Cross Girder M30**	Cum	1	6.552	0.600	1.669	6.561
	Total Quantity per span	Cum					52.031
	Total quantity for 15 m span	**Cum**	**2**				**104.061**
9	**Span-3 (Central Span)**						
a	**Inner Girder**						
	For end portion	Cum	2	0.850	1.526		2.59
	for tapered portion	Cum	2	0.900	1.358		2.44
	for middle portion	Cum	1	23.140	1.190		27.53
b	**Outer Girder**						
	For end portion	Cum	2	0.850	1.815		3.09
	for tapered portion	Cum	2	0.900	1.672		3.01
	for middle portion	Cum	1	11.150	1.529		17.05
c	**Cross girders M30**	Cum	1	7.449	1.269	0.325	3.07
d	**End Cross Girder M30**	Cum	1	6.552	1.669	0.600	6.56
	Total Quantity per span	Cum					65.34
	Total quantity for 14.65 m span	**Cum**	**2**				**130.69**
10	**Total Quantity M40 Concrete**	**Cum**					**709.63**
11	**Total Quantity M35 Concrete**	**Cum**					**436.43**
12	**Steel @ 220 kg /Cum**	**MT**					**252.13**
13	**Prestress steel @ 40 kg /Cum**	**MT**					**28.39**

Section properties RCC T-beam Girder for 15.00 m span

Second Moment of Inertia of girder for Running Section (Inner Girder)

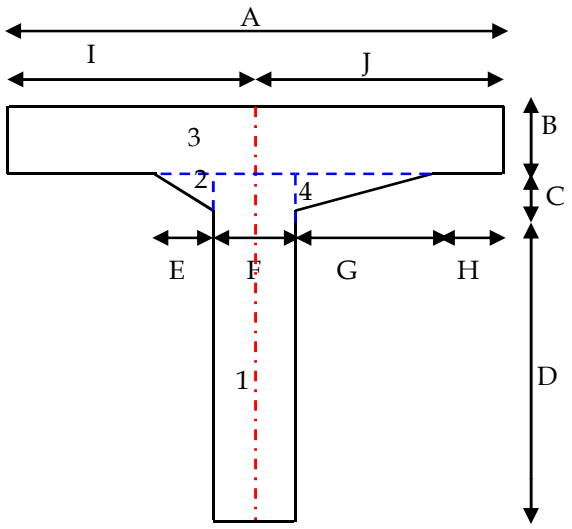
Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.325	1.235	0.401	0.617	0.248	0.153	0.05095
2	Top Hunch	0.300	0.150	0.045	1.185	0.053	0.063	0.000056
3	Top Flange	2.800	0.266	0.743	1.367	1.016	1.390	0.00437
	Total			**1.190**		**1.317**	**1.606**	**0.055**



Depth of Girder		=	1.500	m
A =	2.800	**Y =**	1.108	m
B =	0.266	**I =**	1.662	m^4
C =	0.150	**I_z =**	0.202	m^4
D =	1.085	**Z_t =**	0.516	m^3
E =	0.300	**Z_b =**	0.19	m^3
F =	0.325	**A =**	1.190	m^2

Second Moment of Inertia of girder for Running Section (Outer Girder)

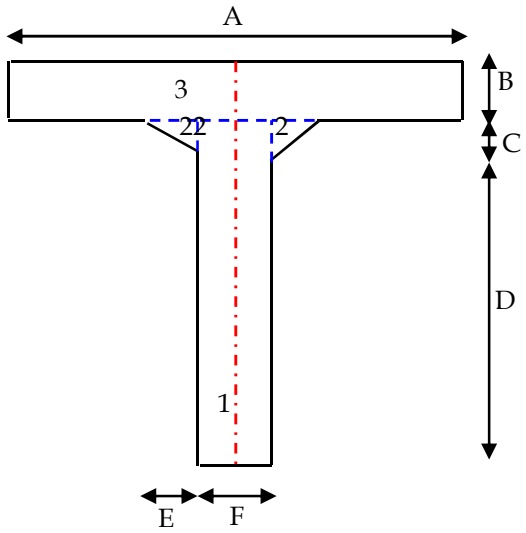
Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.325	1.235	0.401	0.617	0.248	0.153	0.050954
2	Top Hunch	0.300	0.150	0.023	1.185	0.027	0.032	0.000028
3	Top Flange	3.700	0.266	0.982	1.367	1.343	1.836	0.005771
4	Top Hunch	1.638	0.150	0.123	1.185	0.145	0.172	0.000154
	Total			**1.529**	**4.354**	**1.763**	**2.193**	**0.057**



Depth of Girder		=	1.500	m
A =	3.700	**Y =**	1.154	m
B =	0.266	**I =**	2.251	m^4
C =	0.150	**I_z =**	0.215	m^4
D =	1.085	**Z_t =**	0.622	m^3
E =	0.300	**Z_b =**	0.19	m^3
F =	0.325	**A =**	1.529	m^2
G =	1.638	**I =**	1.400	
H =	0.500	**J =**	2.300	

Second Moment of Inertia of girder for Support Section (Inner Girder)

Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.625	1.235	0.772	0.617	0.476	0.294	0.097988
2	Top Hunch	0.150	0.075	0.011	1.210	0.014	0.016	0.000004
3	Top Flange	2.800	0.266	0.743	1.367	1.016	1.390	0.004367
	Total			**1.526**	**3.194**	**1.506**	**1.700**	**0.102358**

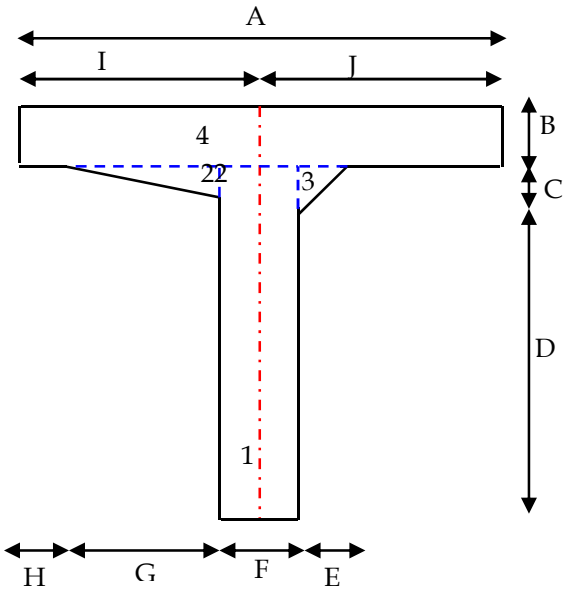


Depth of Girder = 1.500 m

A =	2.800	**Y =**	0.987 m
B =	0.266	**I =**	1.803 m^4
C =	0.075	**I_z =**	0.317 m^4
D =	1.160	**Z_t =**	0.618 m^3
E =	0.15	**Z_b =**	0.33 m^3
F =	0.625	**A =**	1.526 m^2

Second Moment of Inertia of girder for Support Section (Outer Girder)

Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.625	1.235	0.772	0.617	0.476	0.294	0.097988
2	Top Hunch	1.488	0.075	0.056	1.210	0.067	0.082	0.000017
3	Top Hunch	0.150	0.075	0.006	1.210	0.007	0.008	0.000002
4	Top Flange	3.700	0.266	0.982	1.367	1.343	1.836	0.005771
	Total			**1.815**		**1.894**	**2.220**	**0.103778**



Depth of Girder = 1.500 m

A =	3.700	**I =**	2.300
B =	0.266	**J =**	1.400
C =	0.075	**Y =**	1.044 m
D =	1.160	**I =**	2.324 m^4
E =	0.15	**I_z =**	0.346 m^4
F =	0.625	**Z_t =**	0.759 m^3
G =	1.4875	**Z_b =**	0.34 m^3
H =	0.500	**A =**	1.815 m^2

COST ESTIMATE BRIDGE AT KM 70+090		
Sr. No.	**Description**	**Amount (Rs)**
	Span Arrangement = 1X48	
1	**Foundation**	**6,828,199.08**
2	**Sub Structure**	**17,074,959.55**
3	**Super Structure**	**41,337,468.53**
4	**Launching & Erection @ 15% of 3**	**6,200,620.28**
5	**Carriage of Material**	**759,833.84**
	Grand Total	**72,201,081.29**
	Say	**72,202,000.00**

(Rupees seven crore twenty two lakh two thousand) only

ESTIMATE COST FOR BRIDGE AT KM 70+090

Item No.	SOR ref	Description	Unit	Rate (Rs)	Quantity	Amount (Rs)
A		**Foundation**				
1.0	**12.1 -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				
	I	**Ordinary soil (Manual Means)**				
		(i) Depth upto 3 m	Cum	173.00	4108.71	710806.54
		(ii) 3 m to 6 m depth	Cum	222.00	2439.60	541592.16
	III	Hard rock (requiring blasting)	Cum	613.00	210.44	129002.13
2.0	12.8-A	Providing and laying of PCC M 15 levelling course 150 mm thick below the foundation	Cum	6,824.00	45.49	310396.46
3.0		Providing and laying of PCC M 15 in toe portion below SDR Level	Cum	6,824.00	0.00	0.00
4.0	12.8-G	Plain/Reinforced cement concrete M30 in open foundation for abutment wall complete as per drawing and technical specifications	Cum	8,522.00	216.45	1844586.90
5.0	12.40	Supplying, fitting and placing uncoated HYSD bar reinforcement in foundation complete as per drawing and Technical specifications	MT	84,490.00	38.96	3291814.89
		Total Foundation				**6828199.08**
B		**Sub Structure**				
1.00	13.5	Plain/Reinforced Cement Concrete in open foundation complete as per Drawing and Technical specifications				
	G-(p)-C-I	a)RCC Grade M 30 upto 5 m	Cum	9,058.00	150.15	1360101.05
	G-(q)-C-I	b)RCC Grade M 30 above 5 m and upto 10 m	Cum	9,313.00	150.15	1398390.49
	G-(r)-C-I	c)RCC Grade M 30 above 10 m	Cum	9,675.00	200.21	1936995.31
2.00	13.6	Supplying, fitting and placing uncoated HYSD bar reinforcement in substructure complete as per drawing and Technical specifications	MT	84,689.00	90.09	7629869.59
3.00	13.8	Providing weep holes in stone 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 foce. Complete as per drawing and Technical Specifications	Nos	2,033.00	208.00	422864.00
4.00	13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification (A. Granular material)	Cum	1,251.00	1885.82	2359160.02
5.00	13.10	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the rerquirements laid down in clause 2504.2.2 of MOSRT&H specifications to a thickness of not less than 600mm with smaller size towards the soil and bigger size towards the wall and provided over the enire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical specifications	Cum	1,291.00	185.36	239297.49

Item No.	SOR ref	Description	Unit	Rate (Rs)	Quantity	Amount (Rs)
6.00	13.13	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.	tonne capacity	472.00	3600.00	1699200.00
7.00	13.16	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.	cubic centimetre	1.42	20480.00	29081.60
		Total Sub Structure				**17074959.55**
C		**Super Structure**				
1.00	14.1	Furnishing and placing reinforced/Prestressed cement concrete in superstructure as per drawing and Technical specifications				
	E-(i)-(p)-C-1	RCC Grade M 40	Cum	10,689.00	82.36	880388.13
	F-(ii)-(r)-C-1	RCC Grade M 45	Cum	50,458.00	527.26	26604711.38
2.00	14.2	Supplying, fitting and placing HYSD bar reinforcement in superstructure complete as per drawing and Technical specifications	MT	86,265.00	99.19	8556437.84
3.00	14.3	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	MT	200095.00	21.09	4220119.49
4.00	14.5	Providing and laying 56mm 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 reqired level and slope after cleaning the surface including providing anti-skid surface with bitumen precoated fine grained hard stone chipping of 9.50mm nominal size at the rate of 0.005 cum per 10 Sqm ans 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 C protuding 1mm to 4mm over mastiv surfaces all complete as per clause 515.	SQM	484.00	597.98	289419.90
5.00	14.9	Drainage spouts complete as per drawing and Technical Specifications	Nos	2063.00	20.00	41260.00
6.00	14.10	PCC M 15 grade levelling course below approach slab complete as per drawing and Technical	Cum	6563.00	3.83	25152.70
7.00	14.11	Reinforced cement concrete approach slab in RCC M 30 grade including reinforcement and form work complete as per drawing and Technical specifications	Cum	12210.00	25.83	315384.30

Item No.	SOR ref	Description	Unit	Rate (Rs)	Quantity	Amount (Rs)
8.00	14.18-(iii)	Providing and fixing in position 20mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10m to cater for a horizontal movement upto 20mm covered with sealant complete as per drawing and Technical specifications	RM	198.00	24.60	4870.80
9.00	14.22	Providing nad laying of a strip seal expansion joint catering to maximum horizontal movement upto 70mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring	RM	15374.00	26.00	399724.00
		Total Super Structure				**41337468.53**

Carriage of Materials

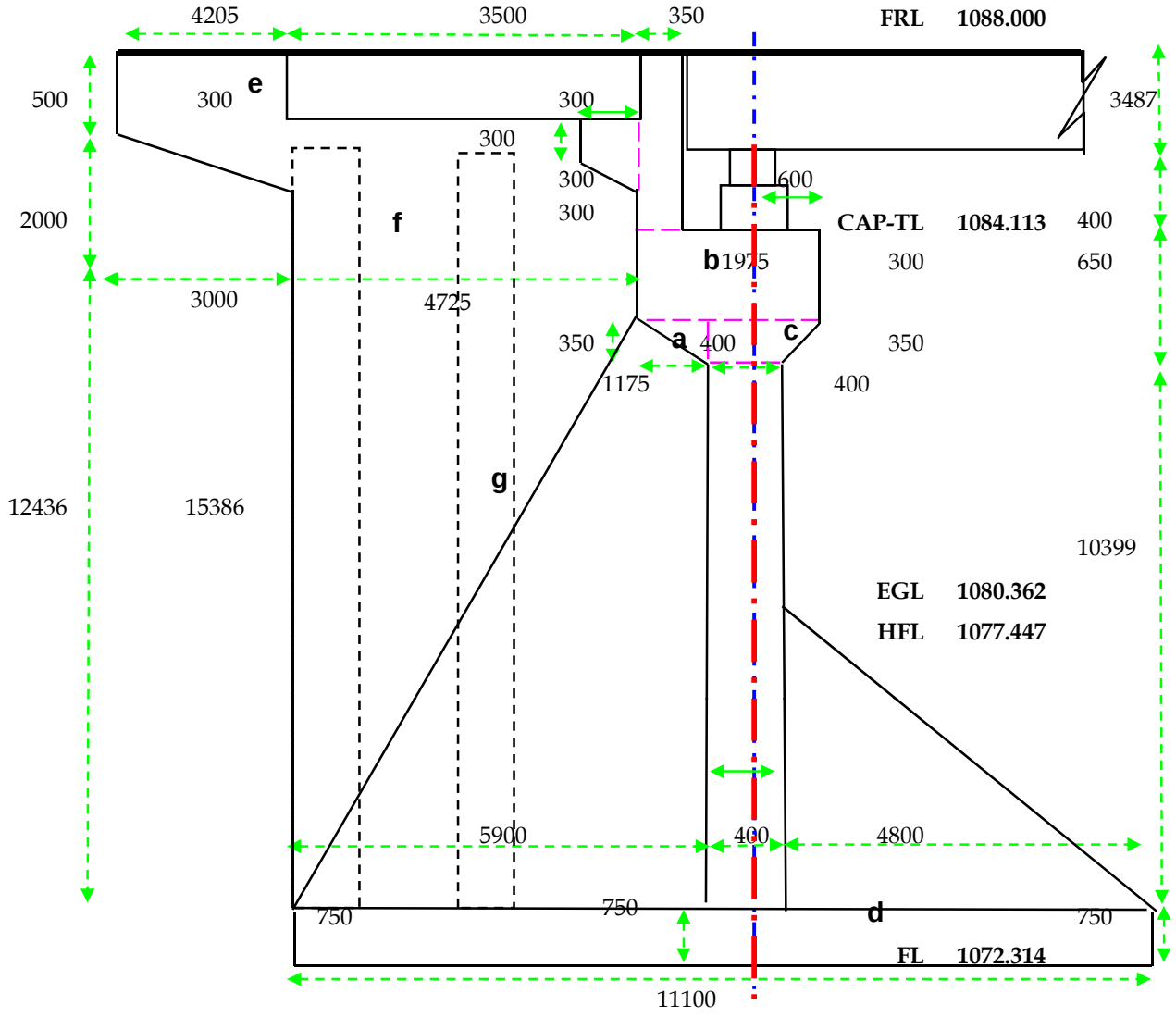
Sr.No.	SOR reference	Description	Unit	Unit of requirement	Total quantity	Unit weight	Carriage distance	Quantity	Rate in Rs	Amount in Rs
1.0	**1.1**	**Loading and unloading of stone boulder/stone aggregates/sand**								
a		**Loading and unloading of stone aggregates**								
		M15 grade concrete	**Cum**	0.89	49.32			43.89	105.00	4608.81
		M30 grade concrete	**Cum**	0.90	742.80			668.52	105.00	70194.18
		M40 grade concrete	**Cum**	0.90	82.36			74.13	105.00	7783.39
		M45 grade concrete	**Cum**	0.90	527.26			474.54	105.00	49826.49
b		**Loading and unloading of sand**								
		M15 grade concrete	**Cum**	0.445	49.32			21.95	105.00	2304.41
		M30 grade concrete	**Cum**	0.450	742.80			334.26	105.00	35097.09
		M40 grade concrete	**Cum**	0.450	82.36			37.06	105.00	3891.70
		M45 grade concrete	**Cum**	0.450	527.26			237.27	105.00	24913.25
c	**1.3**	**Loading and unloading of cement by manual means and stacking**								
		M15 grade concrete	**Cum**	0.320	49.32			15.78	215.00	3393.11
		M30 grade concrete	**Cum**	0.420	742.80			311.97	215.00	67074.44
		M40 grade concrete	**Cum**	0.450	82.36			37.06	215.00	7968.71
		M45 grade concrete	**Cum**	0.450	527.26			237.27	215.00	51012.84
		Steel	**Tonne**	1.050	249.33			261.80	215.00	56286.75
2.0	**1.4**	**Cost of Haulage Excluding Loading and Unloading**								
	(i)	**Surfaced Road**								
		a) Cement	**Ton. km**				135.00	15.78	6.70	14274.75
		b) Stone Aggregates	**Ton. km**				55.00	43.89	6.70	16174.74
		c) Sand	**Ton. km**				55.00	21.95	6.70	8087.37
		d) Steel	**Ton. km**				135.00	261.80	6.70	236797.03

Sr.No.	SOR reference	Description	Unit	Unit of requirement	Total quantity	Unit weight	Carriage distance	Quantity	Rate in Rs	Amount in Rs
	(ii)	**Unsurface road**								
		a) Cement	**Ton. km**				0.00	15.78	8.40	0.00
		b) Stone Aggregates	**Ton. km**			1.74	2.00	43.89	8.40	1283.09
		c) Sand	**Ton. km**			1.84	2.00	21.95	8.40	678.42
		d) Steel	**Ton. km**				0.00	261.80	8.40	0.00
2.0		**Wearing coat**								
a	**1.1**	Loading and unloading of stone aggregates	**Cum**	0.0135				97.374	105.00	10224.24
b	**1.1**	Loading and unloading of Lime stone dust filler with calcium carbonate	**Cum**	0.0050				36.064	105.00	3786.76
c	**1.3**	Loading/Unloading & Carriage cost of Bitument for wearing coat	**Tonnes**	0.0028				20.196	215.00	4342.15
	1.4	Cost of Haulage Excluding Loading and Unloading								
	(i)	**Surface road**								
a		Bitumens	**Ton. km**				135.00	20.20	6.70	18267.31
b		Line stone dust	**Ton. km**			1.80	135.00	36.06	6.70	58716.37
	(ii)	**Unsurface road**								
a		Bitumens	**Ton. km**				0.00	36.06	8.40	0.00
b		Stone Aggregates	**Ton. km**			1.74	2.00	97.374	8.40	2846.43
c		Lime stone dust	**Ton. km**			1.80	0.00	36.064	8.40	0.00
		Grand Total cost for carriage of material								**759833.84**

QUANTITY CALCULATION FOR ABUTMENT WALL (A1)

Design Data:			
Number of spans	=	1	
Span Length	=	49.95	m
Centre to Centre of span length	=	48.00	m
Number of traffic lanes	=	2	
Overall width of carriageway	=	10.5	m
Overall width bridge	=	13.00	m
Road Crest Level	=	1088.000	m
Percentage of camber	=	2.50	%
Depth of composite I girder	=	3.431	m
Vertical Clearance	=	7.066	m
Soffit level	=	1084.513	m
Bottom Level of bearing (Top of pedastal)	=	1084.313	m
Top level of abutment cap	=	1084.113	m
Bottom of abutment cap	=	1083.463	m
H.F.L	=	**1077.447**	m
Scour level	=	**1073.814**	m
Existing groung level	=	**1080.362**	m
Abutment stem bottom Level	**=**	**1073.064**	m
Foundation level	**=**	**1072.314**	m
Number of main girders	=	4	
Width of cap excluding dirt wall	=	1.625	m
Length of bearing	=	0.8	m
Width of bearing	=	0.8	m
Thickness of bearing	=	0.2	m
Depth of bearing pedastal	=	0.2	m
Depth of abutment cap	=	0.65	m
Depth of abutment wall	=	10.399	m
Number of bearings per support	=	1	
Wearing coat thickness	=	0.056	m
Thickness of return wall	=	0.35	m
Bearing capacity of bed rock	=	250	KN/m^2
Foundation strata		Weathered rock	
Angle of Skew θ	=	0	Degree
Cos q ∓ Sin q 0 =			
Length of span skew	=	49.95	m
Length of abutment wall	=	13	m
Rare slope of stem wall with respect Vertical	=	0	Degree

Abutment Figure



SIDE VIEW OF ABUTMENT WALL A1

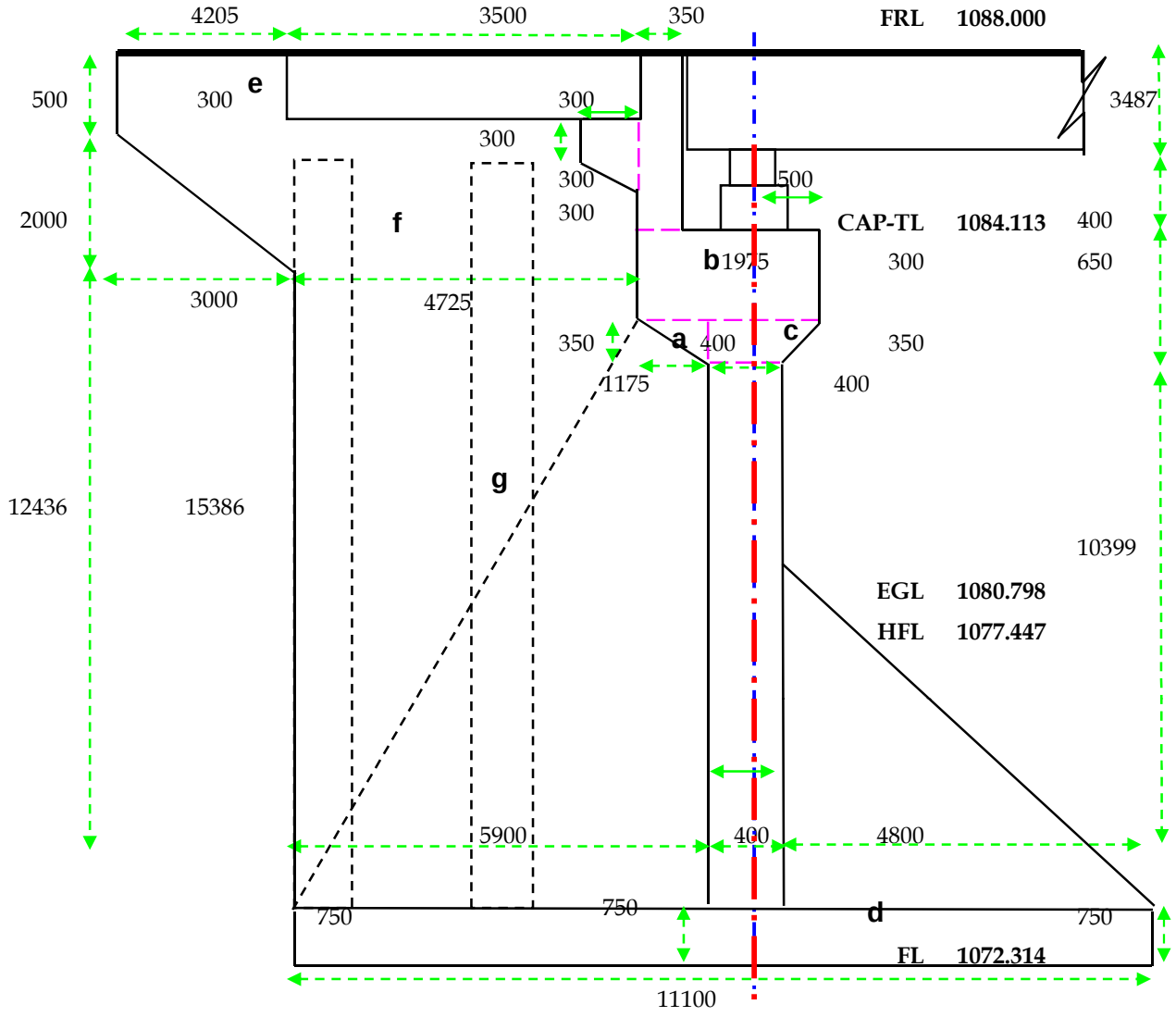
Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	Earthwork for footing						
	up to 3m height from top	Cum	1	24.796	26.696	3.000	1985.86
	3m to 6m height from top	Cum	1	18.796	20.696	3.000	1167.01
	6m & above from top	Cum	1	13.598	15.498	2.198	463.21
	Total quantity	Cum`					3616.08
2	Lean concrete M15 PCC	Cum	1	11.4	13.3	0.15	22.74
3	M15 PCC over toe slab	Cum	1	13.3	0	0.75	0.00
4	Footing Slab M30	Cum	1	13.00	11.1	0.75	108.225
	M30 grade concrete for footing	Cum					108.225
	Steel @ 180 kg /Cum	MT					19.481
5	Back fill with filter media	Cum	1	10.700	0.600	14.436	92.679

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
6	**Back fill with granular media**	Cum	1	10.700	5.900	14.936	**942.910**
7	**Dirt Wall M30**	Cum	1	13.000	0.350	3.831	17.431
8	**Bracket of dirt wall M30**	Cum	1	13.000	0.300	0.450	1.755
9	**Bearing pedestal M30**	Cum	4	1.000	0.600	0.200	0.480
	Seismic arrestor-1 M30	Cum	3	0.500	0.400	1.370	0.822
	Seismic arrestor-2 M30	Cum	2	0.600	0.400	1.370	0.658
10	**Abutment Cap M30**						
	Haunch below dirt wall	Cum	1	13.000	1.188	0.350	2.702
	Full width cap	Cum	1	13.000	1.975	0.300	7.703
11	**Stem M30**	Cum	1	13.000	0.400	10.399	54.075
12	**Wing wall M30**						
	Top rectangular portion	Cum	2	3.500	0.350	0.500	1.225
	Bottom Triangular part	Cum	2	3.000	0.350	1.000	2.100
13	**Return wall M30**						
	Dirt wall part	Cum	2	4.725	0.400	4.131	15.615
	Cap part	Cum	2	5.313	0.400	0.350	1.488
	Stem Part	Cum	2	5.900	0.400	12.436	58.698
14	Front Counter fort	Cum	3	2.400	0.400	4.800	13.824
15	Rear counterfort	Cum	3	3.538	0.400	10.749	45.630
16	Return wall counterfort	Cum	4	1.125	0.400	14.436	25.985
	M30 grade concrete for Substructure	**Cum**					**250.19**
	Steel @ 180 kg /Cum	**MT**					**45.03**
17	**Weep hole**	No	1	104.00			104.00
18	**Bearing**						
	POT CUM PTFE	No	4			4.00	4.00
	Seismic arrestor	Cu cm	5	32.00	20.00	3.20	10240.00
19	**Expansion joint for 50mm**	Rm	1	13.00			13.00
20	**Premoulded expansion joint**	Rm	1	12.30			12.30
21	**Approach slab M30**	Cum	1	3.50	12.30	0.30	12.92
22	**PCC below approach slab M15**	Cum	1	3.65	3.50	0.15	1.92

QUANTITY CALCULATION FOR ABUTMENT WALL (A2)

Design Data:		
Number of spans	= 1	
Span Length	= 49.95	m
Centre to Centre of span length	= 48.00	m
Number of traffic lanes	= 2	
Overall width of carriageway	= 10.5	m
Overall width bridge	= 13.0	m
Road Crest Level	= 1088.000	m
Percentage of camber	= 2.50	%
Depth of composite I girder	= 3.431	m
Vertical Clearance	= 7.066	m
Soffit level	= 1084.513	m
Bottom Level of bearing (Top of pedastal)	= 1084.313	m
Top level of abutment cap	= 1084.113	m
Bottom of abutment cap	= 1083.463	m
H.F.L	= **1077.447**	m
Scour level	= **1074.514**	m
Existing groung level	= **1080.798**	m
Abutment stem bottom Level	**= 1073.064**	m
Foundation level	**= 1072.314**	m
Number of main girders	= 4	
Width of cap excluding dirt wall	= 1.625	m
Length of bearing	= 0.8	m
Width of bearing	= 0.8	m
Thickness of bearing	= 0.2	m
Depth of bearing pedastal	= 0.2	m
Depth of abutment cap	= 0.65	m
Depth of abutment wall	= 10.399	m
Number of bearings per support	= 1	
Wearing coat thickness	= 0.056	m
Thickness of return wall	= 0.35	m
Bearing capacity of bed rock	= 250	KN/m^2
Foundation strata	Weathered rock	
Angle of Skew θ	= 0	Degree
Cos q ∓ Sin q 0 =		
Length of span skew	= 49.95	m
Length of abutment wall	= 13	m
Rare slope of stem wall with respect Vertical	= 0	Degree

Abutment Figure



SIDE VIEW OF ABUTMENT WALL A2

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	Earthwork for footing						
	up to 3m height from top	Cum	1	25.668	27.568	3.000	2122.85
	3m to 6m height from top	Cum	1	19.668	21.568	3.000	1272.60
	6m & above from top	Cum	1	14.034	15.934	2.634	589.01
	Total quantity	Cum`					3984.45
2	Lean concrete M15 PCC	Cum	1	11.4	13.3	0.15	22.74
3	M15 PCC over toe slab	Cum	1	13.3	0	1.45	0.00
4	Footing Slab M30	Cum	1	13.0	11.1	0.75	108.225
	M30 grade concrete for footing	Cum					108.225
	Steel @ 180 kg /Cum	MT					19.481

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
5	**Back fill with filter media**	Cum	1	10.700	0.600	14.436	**92.679**
6	**Back fill with granular media**	Cum	1	10.700	5.900	14.936	**942.910**
7	**Dirt Wall M30**	Cum	1	13.000	0.350	3.831	17.431
8	**Bracket of dirt wall M30**	Cum	1	13.000	0.300	0.450	1.755
9	**Bearing pedestal M30**	Cum	4	1.000	0.600	0.200	0.480
	Seismic arrestor-1 M30	Cum	3	0.500	0.400	1.270	0.762
	Seismic arrestor-2 M30	Cum	2	0.600	0.400	1.270	0.610
10	**Abutment Cap M30**						
	Haunch below dirt wall	Cum	1	13.000	1.188	0.350	2.702
	Full width cap	Cum	1	13.000	1.975	0.300	7.703
11	**Stem M30**	Cum	1	13.000	0.400	10.399	54.075
12	**Wing wall M30**						
	Top rectangular portion	Cum	2	4.205	0.350	0.500	1.472
	Bottom Triangular part	Cum	2	3.000	0.350	1.000	2.100
13	**Return wall M30**						
	Dirt wall part		2	4.725	0.400	4.131	15.615
	Cap part		2	5.313	0.400	0.350	1.488
	Stem Part	Cum	2	5.900	0.400	12.436	58.698
14	Front Counter fort	Cum	3	2.400	0.400	4.800	13.824
15	Rear counterfort	Cum	3	3.538	0.400	10.749	45.630
16	Return wall counterfort	Cum	4	1.125	0.400	14.436	25.985
	M30 grade concrete for Substructure	**Cum**					**250.33**
	Steel @ 180 kg/Cum	**MT**					**45.06**
17	**Weep hole**	No	1	104.00			104.00
18	**Bearing**						
	POT CUM PTFE	No	4			4.00	4.0
	Seismic arrestor	Cu cm	5	32.00	20.00	3.20	10240.00
19	**Expansion joint for 50mm**	Rm	1	13.00			13.00
20	**Premoulded expansion joint**	Rm	1	12.30			12.30
21	**Approach slab M30**	Cum	1	3.50	12.30	0.30	12.92
22	**PCC below approach slab M15**	Cum	1	3.65	3.50	0.15	1.92

QUANTITY CALCULATION FOR SUPER STRUCTURE

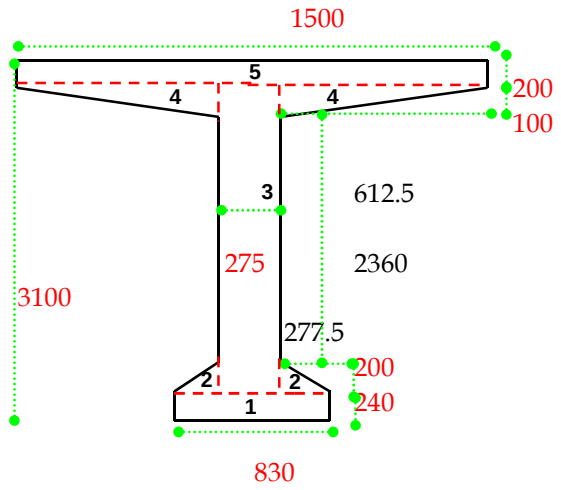
Design Data: **No of span**

Span Length -Type-1	=	1	49.95	m
Overall width of carriageway	=		10.5	m
Overall width bridge	=		13.0	m

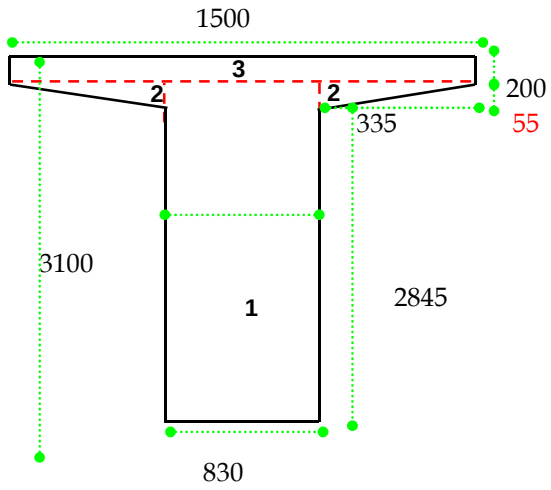
Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	**RCC Crash Barrier**	Rm	2	56.95	0.34	1.05	40.36
2	**Safety Kerb M40**	Cum	2	56.95	1.25	0.30	42.00
3	**Drainage spout**	No	2	10.00			20.00
4	**Wearing coat in Asphaltic concrete 56 mm thick**	Sqm	1	56.95	10.50		597.98
5	**50 m Span**						
a	**Main Girder RCC M45**						
	For end portion	Cum	2.00	3.65	2.725		19.90
	for tapered portion	Cum	2.00	2.75	2.036		11.20
	for middle portion	Cum	1.00	36.00	1.347		48.51
	Quantity per girder	Cum					79.60
	Total Quantity	Cum	4.00				318.42
	Deck Slab	Cum	1.00	48.800	13.000	0.266	168.43
	End Slab portion	Cum	2.00	0.575	13.000	0.445	6.65
b	**Cross girders M45**	Cum	3.000	7.300	0.300	2.660	17.48
c	**End Cross Girder M45**	Cum	2.000	6.580	0.450	2.750	16.29
	Total quantity for single span	**Cum**					**527.26**
	Total Nos of span	**Cum**	1.00				527.26
7	**Total Quantity M40 Concrete**	**Cum**					**527.26**
8	**Total Quantity M40 Concrete**	**Cum**					**82.36**
9	**Steel @ 180 kg /Cum for PSC & 160 kg/Cum for RCC**	**MT**					**99.19**
10	**Prestress steel @ 40 kg /Cum**	**MT**					**21.09**

SECTION PROPERTY FOR 48.0 M SPAN

1 Running Section



2 Support Section



Second Moment of Inertia of girder for Running Section

Sr.No	Description	Length in mm	Depth in mm	Area mm^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Bottom Flange	830	240	1.99E+05	1.20E+02	2.39E+07	2.87E+09	9.56E+08
2	Bottom Hunch	277.5	200	5.55E+04	3.07E+02	1.70E+07	5.22E+09	1.23E+08
3	Web	275	2660	7.32E+05	1.57E+03	1.15E+09	1.80E+12	4.31E+11
4	Top Hunch	612.5	100	6.13E+04	2.87E+03	1.76E+08	5.03E+11	3.40E+07
5	Top Flange	1500	200	3.00E+05	3.00E+03	9.00E+08	2.70E+12	1.00E+09
				1.35E+06	**7.86E+03**	**2.26E+09**	**5.01E+12**	**4.33E+11**

Depth of Girder	=	3100.00 mm	3.100 m
Area **A**	=	1347450.00 mm^2	1.347 m^2
CG from bottom **Y**	=	1680.92 mm	1.681 m
$I = AY^2 + Iself$	=	5.45E+12 mm^4	5.448 m^4
$Iz=I- AxY^2$	=	1.64E+12 mm^4	1.641 m^4

Second Moment of Inertia of girder for Support Section

Sr.No	Description	Length in mm	Depth in mm	Area mm^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Bottom Flange	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	Bottom Hunch	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1	Web	830	2900	2.41E+06	1.45E+03	3.49E+09	5.06E+12	1.69E+12
2	Top Hunch	335.0	55	1.84E+04	2.88E+03	5.31E+07	1.53E+11	3.10E+06
3	Top Flange	1500	200	3.00E+05	3.00E+03	9.00E+08	2.70E+12	1.00E+09
				2.73E+06	**7.33E+03**	**4.44E+09**	**7.91E+12**	**1.69E+12**

Depth of Girder	=	3100.00 mm	3.100 m
Area **A**	=	2725425.00 mm^2	2.725 m^2
CG from bottom **Y**	=	1630.29 mm	1.630 m
$I = AY^2 + Iself$	=	9.60E+12 mm^4	9.602 m^4
$Iz=I- AxY^2$	=	2.36E+12 mm^4	2.358 m^4

COST ESTIMATE FOR BRIDGE AT -KM 70+620		
Sr. No.	**Description**	**Amount (Rs)**
	Span Arrangement = 1X70	
1	**Foundation**	**22,618,820.13**
2	**Sub Structure**	**11,684,051.46**
3	**Super Structure**	**48,510,087.85**
4	**Launching & Erection @ 25% of 3**	**12,127,521.96**
5	**Carriage of Material**	**1,071,670.67**
	Grand Total	**96,012,152.07**
	Say	**96,013,000.00**

(Rupees nine crore sixy lakh thirteen thousand) only

ESTIMATE COST FOR BRIDGE AT -KM 70+620

Item No.	SOR ref	Description	Unit	Rate (Rs)	Quantity	Amount (Rs)
A		**Foundation**				
1.0	**12.1 -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				
	I	**Ordinary soil (Manual Means)**				
		(i) Depth upto 3 m	Cum	173.00	2569.13	444458.80
		(ii) 3 m to 6 m depth	Cum	222.00	1219.93	270824.21
	III	Hard rock (requiring blasting)	Cum	613.00	972.18	595946.49
2.0	12.8-A	Providing and laying of PCC M 15 levelling course 150 mm thick below the foundation	Cum	6,824.00	64.24	438366.94
3.0		Providing and laying of PCC M 15 in toe portion below SDR Level	Cum	6,824.00	0.00	0.00
4.0	12.8-G	Plain/Reinforced cement concrete M30 in open foundation for abutment wall complete as per drawing and technical specifications	Cum	8,522.00	604.50	5151549.00
5.0	12.40	Supplying, fitting and placing uncoated HYSD bar reinforcement in foundation complete as per drawing and Technical specifications	MT	84,490.00	186.03	15717674.70
		Total Foundation				**22618820.13**
B		**Sub Structure**				
1.00	13.5	Plain/Reinforced Cement Concrete in open foundation complete as per Drawing and Technical specifications				
	G-(p)-C-I	a)RCC Grade M 30 upto 5 m	Cum	9,058.00	121.56	1101135.42
	G-(q)-C-I	b)RCC Grade M 30 above 5 m and upto 10 m	Cum	9,313.00	121.56	1132134.48
	G-(r)-C-I	c)RCC Grade M 30 above 10 m	Cum	9,675.00	162.09	1568188.00
2.00	13.6	Supplying, fitting and placing uncoated HYSD bar reinforcement in substructure complete as per drawing and Technical specifications	MT	84,689.00	72.94	6177128.99
3.00	13.8	Providing weep holes in stone 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 foce. Complete as per drawing and Technical Specifications	Nos	2,033.00	184.00	374072.00
4.00	13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification (A. Granular material)	Cum	1,251.00	758.30	948632.81
5.00	13.10	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the rerquirements laid down in clause 2504.2.2 of MOSRT&H specifications to a thickness of not less than 600mm with smaller size towards the soil and bigger size towards the wall and provided over the enire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical specifications	Cum	1,291.00	105.01	135566.15

Item No.	SOR ref	Description	Unit	Rate (Rs)	Quantity	Amount (Rs)
6.00	13.16	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.	cubic centim etre	1.42	174080.00	247193.60
		Total Sub Structure				**11684051.46**
C		**Super Structure**				
1.00	14.1	Furnishing and placing reinforced/Prestressed cement concrete in superstructure as per drawing and Technical specifications				
	C(ii)(r)C1	RCC Grade M 30	Cum	11,160.00	278.22	3104954.17
	E(iii)(r)C1	RCC Grade M 40	Cum	60,120.00	446.88	26866143.04
2.00	14.2	Supplying, fitting and placing HYSD bar reinforcement in superstructure complete as per drawing and Technical specifications	MT	86,265.00	159.52	13761108.40
3.00	14.3	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	MT	200095.00	17.88	3576700.53
4.00	14.5	Providing and laying 56mm 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 reqired level and slope after cleaning the surface including providing anti-skid surface with bitumen precoated fine grained hard stone chipping of 9.50mm nominal size at the rate of 0.005 cum per 10 Sqm ans 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 C protuding 1mm to 4mm over mastiv surfaces all complete as per clause 515.	SQM	484.00	814.38	394159.92
5.00	14.9	Drainage spouts complete as per drawing and Technical Specifications	Nos	2063.00	30.00	61890.00
6.00	14.10	PCC M 15 grade levelling course below approach slab complete as per drawing and Technical	Cum	6563.00	3.83	25152.70
7.00	14.11	Reinforced cement concrete approach slab in RCC M 30 grade including reinforcement and form work complete as per drawing and Technical specifications	Cum	12210.00	25.83	315384.30
8.00	14.18-(iii)	Providing and fixing in position 20mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10m to cater for a horizontal movement upto 20mm covered with sealant complete as per drawing and Technical specifications	RM	198.00	24.60	4870.80
9.00	14.22	Providing nad laying of a strip seal expansion joint catering to maximum horizontal movement upto 70mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring	RM	15374.00	26.00	399724.00
		Total Super Structure				**48510087.85**

Carriage of Materials

Sr.No.	SOR reference	Description	Unit	Unit of requirement	Total quantity	Unit weight	Carriage distance	Quantity	Rate in Rs	Amount in Rs
1.0	**1.1**	**Loading and unloading of stone boulder/stone aggregates/sand**								
a		**Loading and unloading of stone aggregates**								
		M15 grade concrete	**Cum**	0.89	68.07			60.58	105.00	6361.28
		M30 grade concrete	**Cum**	0.90	1313.77			1182.39	105.00	124151.10
		M40 grade concrete	**Cum**	0.90	446.88			402.19	105.00	42229.72
b		**Loading and unloading of sand**								
		M15 grade concrete	**Cum**	0.445	68.07			30.29	105.00	3180.64
		M30 grade concrete	**Cum**	0.450	1313.77			591.20	105.00	62075.55
		M40 grade concrete	**Cum**	0.450	446.88			201.09	105.00	21114.86
c	**1.3**	**Loading and unloading of cement by manual means and stacking**								
		M15 grade concrete	**Tonne**	0.320	68.07			21.78	215.00	4683.32
		M30 grade concrete	**Tonne**	0.420	1313.77			551.78	215.00	118633.27
		M40 grade concrete	**Tonne**	0.450	446.88			201.09	215.00	43235.19
		Steel	**Tonne**	1.050	418.49			439.41	215.00	94474.19
2.0	**1.4**	**Cost of Haulage Excluding Loading and Unloading**								
	(i)	**Surfaced Road**								
		a) Cement	**Ton. km**				135.00	21.78	6.70	19702.61
		b) Stone Aggregates	**Ton. km**				55.00	60.58	6.70	22325.07
		c) Sand	**Ton. km**				55.00	30.29	6.70	11162.53
		d) Steel	**Ton. km**				135.00	439.41	6.70	397450.72

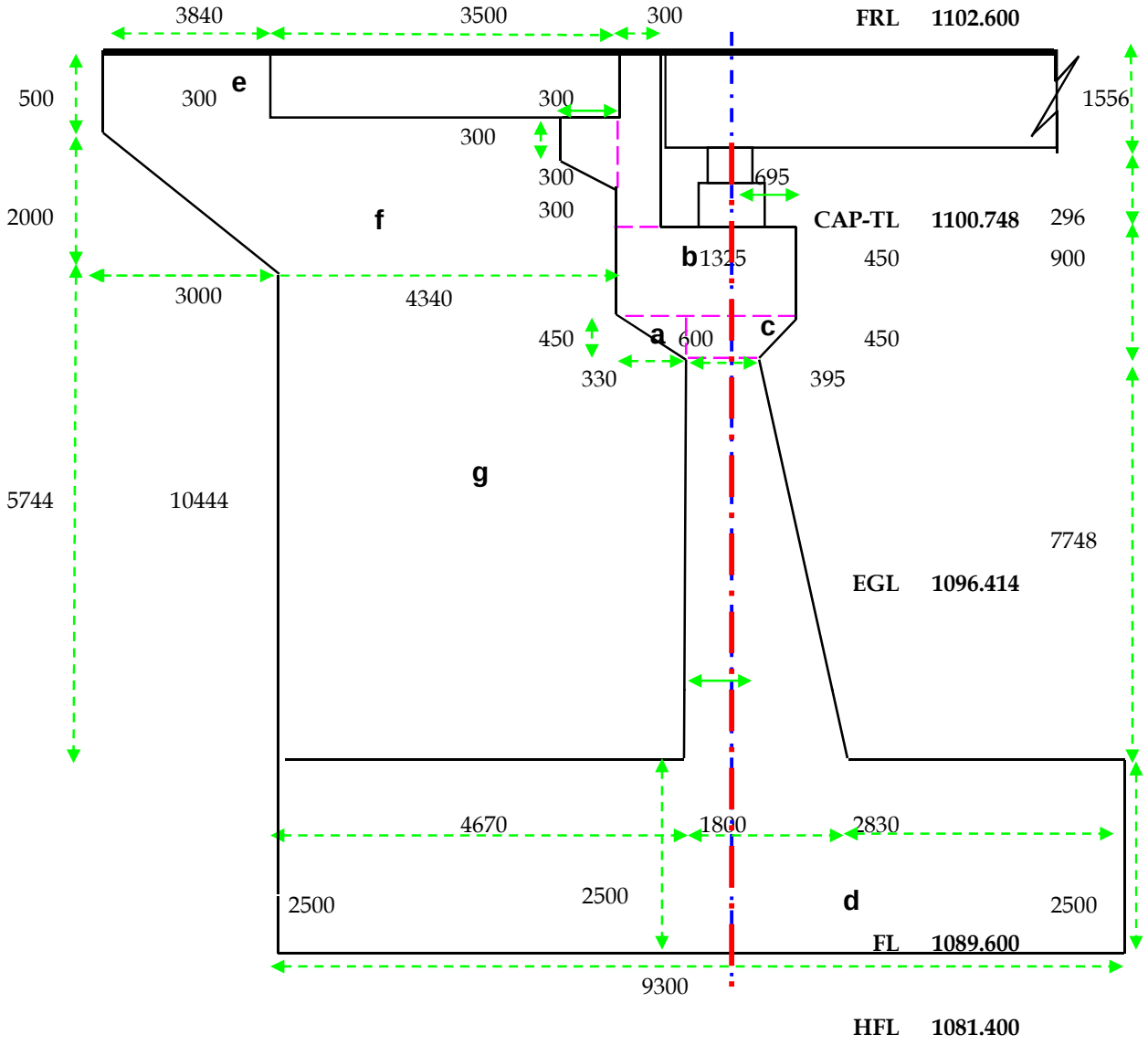
Sr.No.	SOR reference	Description	Unit	Unit of requirement	Total quantity	Unit weight	Carriage distance	Quantity	Rate in Rs	Amount in Rs
	(ii)	**Unsurface road**								
		a) Cement	**Ton. km**				0.00	21.78	8.40	0.00
		b) Stone Aggregates	**Ton. km**			1.74	2.00	60.58	8.40	1770.98
		c) Sand	**Ton. km**			1.84	2.00	30.29	8.40	936.38
		d) Steel	**Ton. km**				0.00	439.41	8.40	0.00
2.0		**Wearing coat**								
a	**1.1**	Loading and unloading of stone aggregates	**Cum**	0.0135				97.374	105.00	10224.24
b	**1.1**	Loading and unloading of Lime stone dust filler with calcium carbonate	**Cum**	0.0050				36.064	105.00	3786.76
c	**1.3**	Loading/Unloading & Carriage cost of Bitument for wearing coat	**Tonnes**	0.0028				20.196	215.00	4342.15
	1.4	Cost of Haulage Excluding Loading and Unloading								
	(i)	**Surface road**								
a		Bitumens	**Ton. km**				135.00	20.20	6.70	18267.31
b		Line stone dust	**Ton. km**			1.80	135.00	36.06	6.70	58716.37
	(ii)	**Unsurface road**								
a		Bitumens	**Ton. km**				0.00	36.06	8.40	0.00
b		Stone Aggregates	**Ton. km**			1.74	2.00	97.374	8.40	2846.43
c		Lime stone dust	**Ton. km**			1.80	0.00	36.064	8.40	0.00
		Grand Total cost for carriage of material								**1071670.67**

QUANTITY CALCULATION FOR ABUTMENT WALL (A1)

Design Data:

Number of spans	= 1	
Span Length	= 15.56	m
Centre to Centre of span length	= 15.00	m
Number of traffic lanes	= 2	
Overall width of carriageway	= 10.5	m
Overall width bridge	= 13.00	m
Road Crest Level	= 1102.600	m
Percentage of camber	= 2.50	%
Depth of T Beam girder	= 1.500	m
Vertical Clearance	= 19.644	m
Soffit level	= 1101.044	m
Bottom Level of bearing (Top of pedastal)	= 1100.844	m
Top level of abutment cap	= 1100.748	m
Bottom of abutment cap	= 1099.848	m
H.F.L	= **1081.400**	m
Scour level	= **1091.600**	m
Existing groung level	= **1096.414**	m
Abutment stem bottom Level	**= 1092.100**	m
Foundation level	**= 1089.600**	m
Number of main girders	= 4	
Width of cap excluding dirt wall	= 1.025	m
Length of bearing	= 0.5	m
Width of bearing	= 0.4	m
Thickness of bearing	= 0.2	m
Depth of bearing pedastal	= 0.096	m
Depth of abutment cap	= 0.9	m
Depth of abutment wall	= 7.748	m
Number of bearings per support	= 1	
Wearing coat thickness	= 0.056	m
Thickness of return wall	= 0.35	m
Bearing capacity of bed rock	= 400	KN/m^2
Foundation strata	Weathered rock	
Angle of Skew θ	= 0	Degree
Cos q ∓ Sin q 0 =		
Length of span skew	= 15.56	m
Length of abutment wall	= 13	m
Rare slope of stem wall with respect Vertical	= 0	Degree

Abutment Figure



SIDE VIEW OF ABUTMENT WALL A1

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	Earthwork for footing						
	up to 3m height from top	Cum	1	20.528	24.228	3.000	1492.06
	3m to 6m height from top	Cum	1	14.528	18.228	3.000	794.45
	6m & above from top						
	For raft	Cum	1	10.564	14.264	0.964	145.26
	For Toe Step	Cum	5	4.000	14.264	1.500	427.92
	Total quantity	Cum`					2859.69
2	Lean concrete M15 PCC	Cum	1	9.600	13.300	0.150	19.15
	For Toe Step-1	Cum	1	13.300	2.500	0.150	4.99
	For Toe Step-2 to 5	Cum	4	13.300	2.000	0.150	15.96
3	M15 PCC over toe slab	Cum	1	13.300	2.830	0.000	0.00
4	Footing Slab M30	Cum	1	13.000	9.300	2.500	302.25

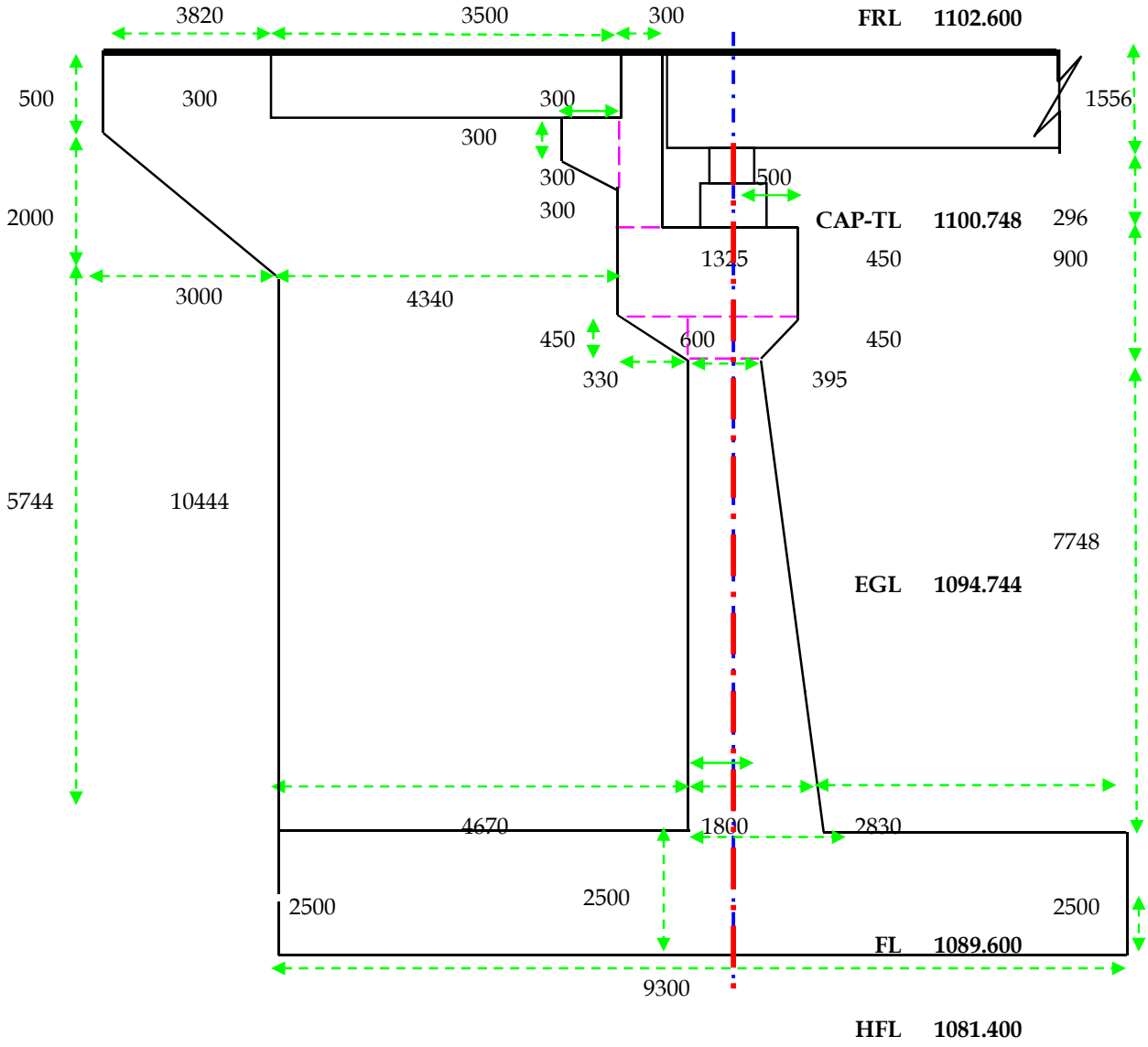
Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
	For Toe Step-1	Cum	1	13.000	4.000	1.500	78.00
	For Toe Step-2 to 5	Cum	4	13.000	3.500	1.500	273.00
	M30 grade concrete for footing	**Cum**					**653.250**
	Steel @ 180 kg/Cum	**MT**					**117.585**
5	**Back fill with filter media**	Cum	1	11.300	0.600	7.744	**52.504**
6	**Back fill with granular media**	Cum	1	11.300	4.070	8.244	**379.150**
7	**Dirt Wall M30**	Cum	1	13.000	0.300	1.796	7.004
8	**Bracket of dirt wall M30**	Cum	1	13.000	0.300	0.450	1.755
9	**Bearing pedestal M30**	Cum	4	0.500	0.400	0.096	0.077
	Seismic arrestor-1 M30	Cum	3	0.500	0.400	1.420	0.852
	Seismic arrestor-2 M30	Cum	2	0.600	0.400	1.420	0.682
10	**Abutment Cap M30**						
	Haunch below dirt wall	Cum	1	13.000	0.963	0.450	2.815
	Full width cap	Cum	1	13.000	1.325	0.450	7.751
11	**Stem M30**	Cum	1	13.000	1.200	7.748	120.869
12	**Wing wall M30**						
	Top rectangular portion	Cum	2	3.840	0.350	0.500	1.344
	Bottom Triangular part	Cum	2	3.000	0.350	1.000	2.100
13	**Return wall M30**						
	Dirt wall part	Cum	2	4.340	0.500	2.246	9.748
	Cap part	Cum	2	4.505	0.500	0.450	2.027
	Stem Part	Cum	2	4.670	0.850	5.744	45.602
	M30 grade concrete for Substructure	**Cum**					**202.63**
	Steel @ 180 kg/Cum	**MT**					**36.47**
14	**Weep hole**	No	1	92.00			92.00
15	**Bearing**						
	ELASTOMERIC Bearing	Cu cm	4	50.00	40.00	9.60	76800.00
	Seismic arrestor	Cu cm	5	32.00	20.00	3.20	10240.00
16	**Expansion joint for 50mm**	Rm	1	13.00			13.00
17	**Premoulded expansion joint**	Rm	1	12.30			12.30
18	**Approach slab M30**	Cum	1	3.50	12.30	0.30	12.92
19	**PCC below approach slab M15**	Cum	1	3.65	3.50	0.15	1.92

QUANTITY CALCULATION FOR ABUTMENT WALL (A2)

Design Data:

Number of spans	= 1	
Span Length	= 15.56	m
Centre to Centre of span length	= 15.00	m
Number of traffic lanes	= 2	
Overall width of carriageway	= 10.5	m
Overall width bridge	= 13.0	m
Road Crest Level	= 1102.600	m
Percentage of camber	= 2.50	%
Depth of T Beam girder	= 1.500	m
Vertical Clearance	= 19.644	m
Soffit level	= 1101.044	m
Bottom Level of bearing (Top of pedastal)	= 1100.948	m
Top level of abutment cap	= 1100.748	m
Bottom of abutment cap	= 1099.848	m
H.F.L	= **1081.400**	m
Scour level	= **1091.600**	m
Existing groung level	= **1094.744**	m
Abutment stem bottom Level	**= 1092.100**	m
Foundation level	**= 1089.600**	m
Number of main girders	= 4	
Width of cap excluding dirt wall	= 1.025	m
Length of bearing	= 0.7	m
Width of bearing	= 0.6	m
Thickness of bearing	= 0.096	m
Depth of bearing pedastal	= 0.2	m
Depth of abutment cap	= 0.9	m
Depth of abutment wall	= 7.748	m
Number of bearings per support	= 1	
Wearing coat thickness	= 0.056	m
Thickness of return wall	= 0.35	m
Bearing capacity of bed rock	= 400	KN/m^2
Foundation strata	Weathered rock	
Angle of Skew θ	= 0	Degree
Cos q ∓ Sin q 0 =		
Length of span skew	= 15.56	m
Length of abutment wall	= 13	m
Rare slope of stem wall with respect Vertical	= 0	Degree

Abutment Figure



SIDE VIEW OF ABUTMENT WALL A2

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	Earthwork for footing						
	up to 3m height from top	Cum	1	17.188	20.888	3.000	1077.07
	3m to 6m height from top	Cum	1	11.894	15.594	2.294	425.48
	6m & above from top	Cum	1	9.600	13.300	0.000	0.00
	For Toe Step	Cum	5	4.000	13.300	1.500	399.00
	Total quantity	Cum`					1901.55
2	Lean concrete M15 PCC	Cum	1	9.600	13.300	0.150	19.15
	For Toe Step-1	Cum	1	13.300	2.500	0.150	4.99
3	M15 PCC over toe slab	Cum	1	13.300	2.830	0.000	0.00
4	Footing Slab M30	Cum	1	13.000	9.300	2.500	302.25
	For Toe Step-1	Cum	1	13.000	4.000	1.500	78.00

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
	M30 grade concrete for footing	**Cum**					**380.250**
	Steel @ 180 kg /Cum	**MT**					**68.445**
5	**Back fill with filter media**	Cum	1	11.300	0.600	7.744	**52.504**
6	**Back fill with granular media**	Cum	1	11.300	4.070	8.244	**379.150**
7	**Dirt Wall M30**	Cum	1	13.000	0.300	1.796	7.004
8	**Bracket of dirt wall M30**	Cum	1	13.000	0.300	0.450	1.755
9	**Bearing pedestal M30**	Cum	4	0.700	0.600	0.200	0.336
	Seismic arrestor-1 M30	Cum	3	0.500	0.400	1.420	0.852
	Seismic arrestor-2 M30	Cum	2	0.600	0.400	1.420	0.682
10	**Abutment Cap M30**						
	Haunch below dirt wall	Cum	1	13.000	0.963	0.450	2.815
	Full width cap	Cum	1	13.000	1.325	0.450	7.751
11	**Stem M30**	Cum	1	13.000	1.200	7.748	120.869
12	**Wing wall M30**						
	Top rectangular portion	Cum	2	3.000	0.350	0.500	1.050
	Bottom Triangular part	Cum	2	3.000	0.350	1.000	2.100
13	**Return wall M30**						
	Dirt wall part	Cum	2	4.340	0.500	2.246	9.748
	Cap part	Cum	2	4.505	0.500	0.450	2.027
	Stem Part	Cum	2	4.670	0.850	5.744	45.602
	M30 grade concrete for Substructure	**Cum**					**202.59**
	Steel @ 180 kg /Cum	**MT**					**36.47**
14	**Weep hole**	No	1	92.00			92.00
15	**Bearing**						
	ELASTOMERIC Bearing	Cu cm	4	50.00	40.00	9.60	76800.00
	Seismic arrestor	Cu cm	5	32.00	20.00	3.20	10240.00
16	**Expansion joint for 50mm**	Rm	1	13.00			13.00
17	**Premoulded expansion joint**	Rm	1	12.30			12.30
18	**Approach slab M30**	Cum	1	3.50	12.30	0.30	12.92
19	**PCC below approach slab M15**	Cum	1	3.65	3.50	0.15	1.92

QUANTITY CALCULATION FOR SUPER STRUCTURE

Design Data: **No of span**

Span Length -Type-1	=	1	70.56	m
Overall width of carriageway	=		10.5	m
Overall width bridge	=		13.0	m

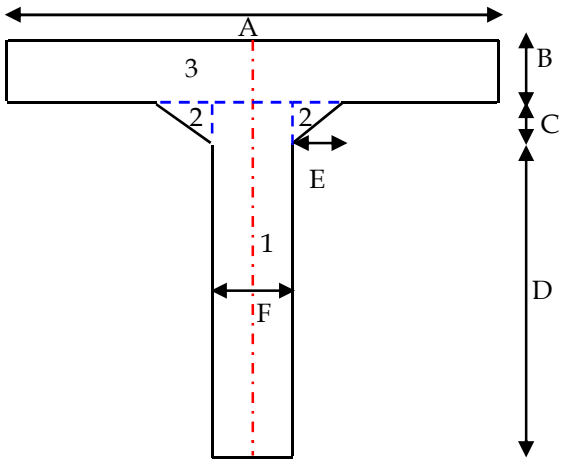
Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	**RCC Crash Barrier M40**	Rm	2	77.56	0.34	1.05	54.97
2	**Safety Kerb M40**	Cum	2	77.56	1.25	0.30	57.20
3	**Drainage spout**	No	2	15.00			30.00
4	**Wearing coat in Asphaltic concrete 56 mm thick**	Sqm	1	77.56	10.50		814.38
5	**Rib**						
a	**Main Girder RCC M40**						
	Main Rib mid portion	Cum	4.00	62.300	0.900	1.000	224.28
	Main Rib Support portion	Cum	8.00	4.900	0.900	1.375	48.51
	Cross beam-1 (Connecting to Rib)	Cum	15.00	1.900	0.600	0.600	10.26
	Cross beam-2 (Connecting to Pier-1)	Cum	2.00	5.700	1.050	1.386	16.59
	Cross beam-3(Connecting to Pier-2)	Cum	2.00	5.700	1.050	1.145	13.71
b	**Pier on arch Rib**						
	Pier on arch Rib-1	Cum	8.00	0.900	0.900	3.114	20.18
	Pier on arch Rib-2	Cum	8.00	0.900	0.900	0.182	1.18
	Total quantity for single span	**Cum**					**334.70**
	Total Nos of span	**Cum**	**1**				**334.70**
6	**Span-1 (End Span)**						
a	**Inner Girder**						
	For end portion at start	Cum	1	0.980	1.526		1.496
	For end portion at end	Cum	1	0.850	1.526		1.297
	For tapered portion	Cum	2	0.900	1.358		2.444
	For middle portion	Cum	1	11.650	1.190		13.859
b	**Outer Girder**						
	For end portion at start	Cum	1	0.980	1.815		1.779
	For end portion at end	Cum	1	1.500	1.815		2.723
	For tapered portion	Cum	2	0.900	1.672		3.010
	For middle portion	Cum	1	11.650	1.529		17.811
c	**Cross girders M30**	Cum	1	7.449	0.325	0.769	1.862
d	**End Cross Girder M30**	Cum	1	6.552	0.325	0.769	1.638
	Total Quantity per span	Cum					47.919
	Total quantity for 15 m span	**Cum**	**2**				**95.837**
7	**Span-2 (Intermediate Span)**						
a	**Inner Girder**						
	For end portion	Cum	2	0.850	1.526		2.595
	For tapered portion	Cum	2	0.900	1.358		2.444
	For middle portion	Cum	1	11.500	1.190		13.681
b	**Outer Girder**						
	For end portion	Cum	2	0.850	1.815		3.086
	For tapered portion	Cum	2	0.900	1.672		3.010
	For middle portion	Cum	1	11.500	1.529		17.582
c	**Cross girders M30**	Cum	1	7.449	0.325	1.269	3.072
d	**End Cross Girder M30**	Cum	1	6.552	0.600	1.669	6.561
	Total Quantity per span	Cum					52.031
	Total quantity for 15 m span	**Cum**	**2**				**104.061**
8	**Span-3 (Central Span)**						

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
a	**Inner Girder**						
	For end portion	Cum	1	0.850	1.526		1.30
	for tapered portion	Cum	1	0.900	1.358		1.22
	for middle portion	Cum	1	3.250	1.190		3.87
b	**Outer Girder**						
	For end portion	Cum	2	0.850	1.815		3.09
	for tapered portion	Cum	2	0.900	1.672		3.01
	for middle portion	Cum	1	11.150	1.529		17.05
c	**Cross girders M30**	Cum	1	7.449	1.269	0.325	3.07
d	**End Cross Girder M30**	Cum	1	6.552	1.669	0.600	6.56
	Total Quantity per span	Cum					39.16
	Total quantity for 5.00 m span	**Cum**	**2**				**78.32**
9	**Total Quantity M40 Concrete**	**Cum**					**446.88**
10	**Total Quantity M35 Concrete**	**Cum**					**278.22**
11	**Steel @ 220 kg /Cum**	**MT**					**159.52**
12	**Prestress steel @ 40 kg /Cum**	**MT**					**17.88**

Section properties RCC T-beam Girder for 15.00 m span

Second Moment of Inertia of girder for Running Section (Inner Girder)

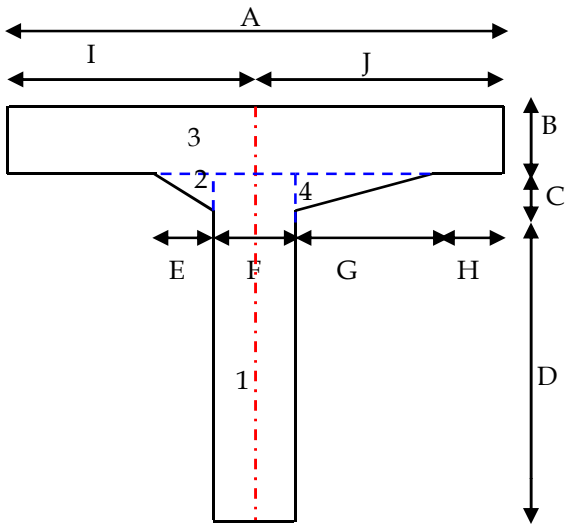
Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.325	1.235	0.401	0.617	0.248	0.153	0.05095
2	Top Hunch	0.300	0.150	0.045	1.185	0.053	0.063	0.000056
3	Top Flange	2.800	0.266	0.743	1.367	1.016	1.390	0.00437
	Total			**1.190**		**1.317**	**1.606**	**0.055**



Depth of Girder		=	1.500	m
A =	2.800	**Y =**	1.108	m
B =	0.266	**I =**	1.662	m^4
C =	0.150	**I_z =**	0.202	m^4
D =	1.085	**Z_t =**	0.516	m^3
E =	0.300	**Z_b =**	0.19	m^3
F =	0.325	**A =**	1.190	m^2

Second Moment of Inertia of girder for Running Section (Outer Girder)

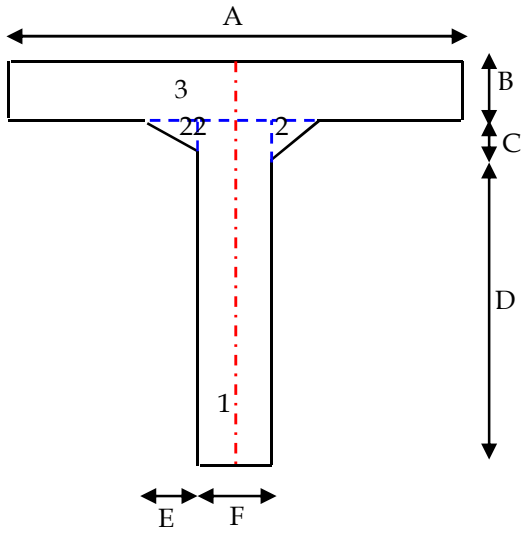
Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.325	1.235	0.401	0.617	0.248	0.153	0.050954
2	Top Hunch	0.300	0.150	0.023	1.185	0.027	0.032	0.000028
3	Top Flange	3.700	0.266	0.982	1.367	1.343	1.836	0.005771
4	Top Hunch	1.638	0.150	0.123	1.185	0.145	0.172	0.000154
	Total			**1.529**	**4.354**	**1.763**	**2.193**	**0.057**



Depth of Girder		=	1.500	m
A =	3.700	**Y =**	1.154	m
B =	0.266	**I =**	2.251	m^4
C =	0.150	**I_z =**	0.215	m^4
D =	1.085	**Z_t =**	0.622	m^3
E =	0.300	**Z_b =**	0.19	m^3
F =	0.325	**A =**	1.529	m^2
G =	1.638	**I =**	1.400	
H =	0.500	**J =**	2.300	

Second Moment of Inertia of girder for Support Section (Inner Girder)

Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.625	1.235	0.772	0.617	0.476	0.294	0.097988
2	Top Hunch	0.150	0.075	0.011	1.210	0.014	0.016	0.000004
3	Top Flange	2.800	0.266	0.743	1.367	1.016	1.390	0.004367
	Total			**1.526**	**3.194**	**1.506**	**1.700**	**0.102358**

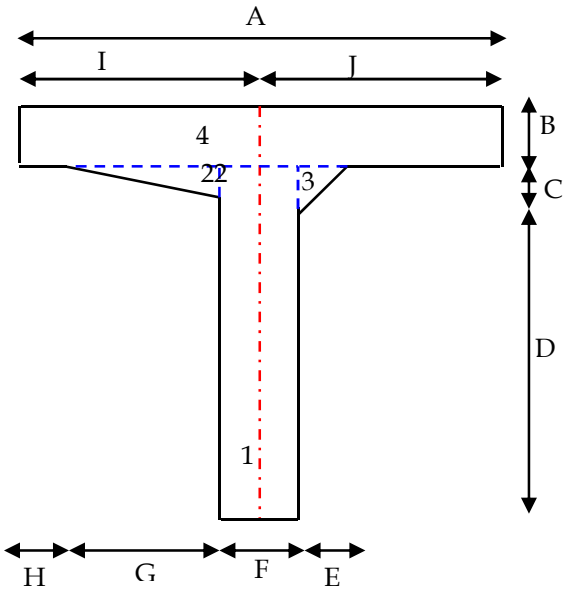


Depth of Girder = 1.500 m

A =	2.800	**Y =**	0.987 m
B =	0.266	**I =**	1.803 m^4
C =	0.075	**I_z =**	0.317 m^4
D =	1.160	**Z_t =**	0.618 m^3
E =	0.15	**Z_b =**	0.33 m^3
F =	0.625	**A =**	1.526 m^2

Second Moment of Inertia of girder for Support Section (Outer Girder)

Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.625	1.235	0.772	0.617	0.476	0.294	0.097988
2	Top Hunch	1.488	0.075	0.056	1.210	0.067	0.082	0.000017
3	Top Hunch	0.150	0.075	0.006	1.210	0.007	0.008	0.000002
4	Top Flange	3.700	0.266	0.982	1.367	1.343	1.836	0.005771
	Total			**1.815**		**1.894**	**2.220**	**0.103778**



Depth of Girder = 1.500 m

A =	3.700	**I =**	2.300
B =	0.266	**J =**	1.400
C =	0.075	**Y =**	1.044 m
D =	1.160	**I =**	2.324 m^4
E =	0.15	**I_z =**	0.346 m^4
F =	0.625	**Z_t =**	0.759 m^3
G =	1.4875	**Z_b =**	0.34 m^3
H =	0.500	**A =**	1.815 m^2

COST ESTIMATE BRIDGE AT KM 74+355		
Sr. No.	**Description**	**Amount (Rs)**
	Span Arrangement = 1X20+1X48+1X20	
1	**Foundation**	**15,423,686.88**
2	**Sub Structure**	**22,538,118.34**
3	**Super Structure**	**49,793,754.91**
4	**Launching & Erection @ 15% of 3**	**7,469,063.24**
5	**Carriage of Material**	**1,329,649.14**
	Grand Total	**96,554,272.49**
	Say	**96,555,000.00**

(Rupees nine crore sixty five lakh fifty five thousand) only

ESTIMATE COST FOR BRIDGE AT KM 74+355

Item No.	SOR ref	Description	Unit	Rate (Rs)	Quantity	Amount (Rs)
A		**Foundation**				
1.0	**12.1 -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				
	I	**Ordinary soil (Manual Means)**				
		(i) Depth upto 3 m	Cum	173.00	4289.21	742032.88
		(ii) 3 m to 6 m depth	Cum	222.00	1753.88	389360.43
	III	Hard rock (requiring blasting)	Cum	613.00	765.48	469241.45
2.0	12.8-A	Providing and laying of PCC M 15 levelling course 150 mm thick below the foundation	Cum	6,824.00	127.07	867098.38
3.0		Providing and laying of PCC M 15 in toe portion below SDR Level	Cum	6,824.00	156.53	1068154.29
4.0	12.8-G	Plain/Reinforced cement concrete M30 in open foundation for abutment wall complete as per drawing and technical specifications	Cum	8,522.00	483.76	4122560.11
5.0	12.40	Supplying, fitting and placing uncoated HYSD bar reinforcement in foundation complete as per drawing and Technical specifications	MT	84,490.00	91.91	7765239.33
		Total Foundation				**15423686.88**
B		**Sub Structure**				
1.00	13.5	Plain/Reinforced Cement Concrete in open foundation complete as per Drawing and Technical specifications				
	G-(p)-C-I	a)RCC Grade M 30 upto 5 m	Cum	9,058.00	184.23	1668799.26
	G-(q)-C-I	b)RCC Grade M 30 above 5 m and upto 10 m	Cum	9,313.00	184.23	1715779.14
	G-(r)-C-I	c)RCC Grade M 30 above 10 m	Cum	9,675.00	245.65	2376629.54
2.00	13.6	Supplying, fitting and placing uncoated HYSD bar reinforcement in substructure complete as per drawing and Technical specifications	MT	84,689.00	122.60	10382592.55
3.00	13.8	Providing weep holes in stone 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 foce. Complete as per drawing and Technical Specifications	Nos	2,033.00	156.00	317148.00
4.00	13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification (A. Granular material)	Cum	1,251.00	608.19	760844.44
5.00	13.10	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the rerquirements laid down in clause 2504.2.2 of MOSRT&H specifications to a thickness of not less than 600mm with smaller size towards the soil and bigger size towards the wall and provided over the enire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical specifications	Cum	1,291.00	101.84	131480.60

Item No.	SOR ref	Description	Unit	Rate (Rs)	Quantity	Amount (Rs)
6.00	13.13	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.	tonne capacity	472.00	10800.00	5097600.00
7.00	13.16	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.	cubic centimetre	1.42	61440.00	87244.80
		Total Sub Structure				**22538118.34**
C		**Super Structure**				
1.00	14.1	Furnishing and placing reinforced/Prestressed cement concrete in superstructure as per drawing and Technical specifications				
	C-(ii)-(r)-C-1	RCC Grade M 30	Cum	11,160.00	310.54	3465585.53
	E-(i)-(p)-C-1	RCC Grade M 40	Cum	10,689.00	141.83	1516060.82
	F-(ii)-(r)-C-1	RCC Grade M 45	Cum	50,458.00	529.40	26712220.23
2.00	14.2	Supplying, fitting and placing HYSD bar reinforcement in superstructure complete as per drawing and Technical specifications	MT	86,265.00	140.74	12141073.93
3.00	14.3	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	MT	200095.00	21.18	4237172.86
4.00	14.5	Providing and laying 56mm 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 reqired level and slope after cleaning the surface including providing anti-skid surface with bitumen precoated fine grained hard stone chipping of 9.50mm nominal size at the rate of 0.005 cum per 10 Sqm ans 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 C protuding 1mm to 4mm over mastiv surfaces all complete as per clause 515.	SQM	484.00	1029.74	498391.74
5.00	14.9	Drainage spouts complete as per drawing and Technical Specifications	Nos	2063.00	38.00	78394.00
6.00	14.10	PCC M 15 grade levelling course below approach slab complete as per drawing and Technical	Cum	6563.00	3.83	25152.70
7.00	14.11	Reinforced cement concrete approach slab in RCC M 30 grade including reinforcement and form work complete as per drawing and Technical specifications	Cum	12210.00	25.83	315384.30

Item No.	SOR ref	Description	Unit	Rate (Rs)	Quantity	Amount (Rs)
8.00	14.18-(iii)	Providing and fixing in position 20mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10m to cater for a horizontal movement upto 20mm covered with sealant complete as per drawing and Technical specifications	RM	198.00	24.60	4870.80
9.00	14.22	Providing nad laying of a strip seal expansion joint catering to maximum horizontal movement upto 70mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring	RM	15374.00	52.00	799448.00
		Total Super Structure				**49793754.91**

Carriage of Materials

Sr.No.	SOR reference	Description	Unit	Unit of requirement	Total quantity	Unit weight	Carriage distance	Quantity	Rate in Rs	Amount in Rs
1.0	**1.1**	**Loading and unloading of stone boulder/stone aggregates/sand**								
a		**Loading and unloading of stone aggregates**								
		M15 grade concrete	**Cum**	0.89	287.43			255.81	105.00	26860.11
		M30 grade concrete	**Cum**	0.90	1434.24			1290.81	105.00	135535.44
		M40 grade concrete	**Cum**	0.90	141.83			127.65	105.00	13403.29
		M45 grade concrete	**Cum**	0.90	529.40			476.46	105.00	50027.84
b		**Loading and unloading of sand**								
		M15 grade concrete	**Cum**	0.445	287.43			127.91	105.00	13430.05
		M30 grade concrete	**Cum**	0.450	1434.24			645.41	105.00	67767.72
		M40 grade concrete	**Cum**	0.450	141.83			63.83	105.00	6701.64
		M45 grade concrete	**Cum**	0.450	529.40			238.23	105.00	25013.92
c	**1.3**	**Loading and unloading of cement by manual means and stacking**								
		M15 grade concrete	**Cum**	0.320	287.43			91.98	215.00	19775.02
		M30 grade concrete	**Cum**	0.420	1434.24			602.38	215.00	129511.65
		M40 grade concrete	**Cum**	0.450	141.83			63.83	215.00	13722.41
		M45 grade concrete	**Cum**	0.450	529.40			238.23	215.00	51218.98
		Steel	**Tonne**	1.050	376.42			395.24	215.00	84977.11
2.0	**1.4**	**Cost of Haulage Excluding Loading and Unloading**								
	(i)	**Surfaced Road**								
		a) Cement	**Ton. km**				135.00	91.98	6.70	83193.03
		b) Stone Aggregates	**Ton. km**				55.00	255.81	6.70	94266.18
		c) Sand	**Ton. km**				55.00	127.91	6.70	47133.09
		d) Steel	**Ton. km**				135.00	395.24	6.70	357496.73

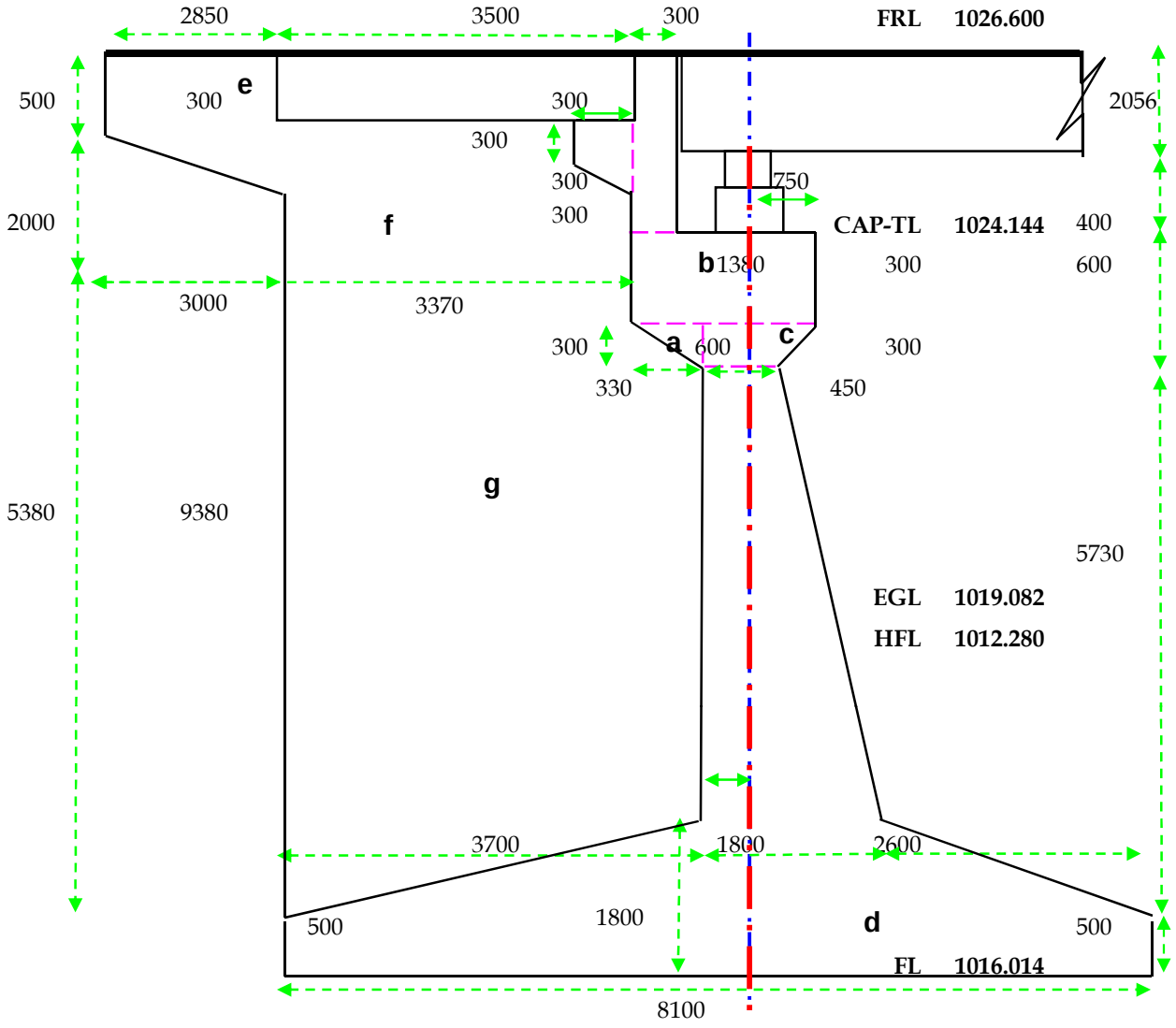
Sr.No.	SOR reference	Description	Unit	Unit of requirement	Total quantity	Unit weight	Carriage distance	Quantity	Rate in Rs	Amount in Rs
	(ii)	**Unsurface road**								
		a) Cement	**Ton. km**				0.00	91.98	8.40	0.00
		b) Stone Aggregates	**Ton. km**			1.74	2.00	255.81	8.40	7477.85
		c) Sand	**Ton. km**			1.84	2.00	127.91	8.40	3953.81
		d) Steel	**Ton. km**				0.00	395.24	8.40	0.00
2.0		**Wearing coat**								
a	**1.1**	Loading and unloading of stone aggregates	**Cum**	0.0135				97.374	105.00	10224.24
b	**1.1**	Loading and unloading of Lime stone dust filler with calcium carbonate	**Cum**	0.0050				36.064	105.00	3786.76
c	**1.3**	Loading/Unloading & Carriage cost of Bitument for wearing coat	**Tonnes**	0.0028				20.196	215.00	4342.15
	1.4	Cost of Haulage Excluding Loading and Unloading								
	(i)	**Surface road**								
a		Bitumens	**Ton. km**				135.00	20.20	6.70	18267.31
b		Line stone dust	**Ton. km**			1.80	135.00	36.06	6.70	58716.37
	(ii)	**Unsurface road**								
a		Bitumens	**Ton. km**				0.00	36.06	8.40	0.00
b		Stone Aggregates	**Ton. km**			1.74	2.00	97.374	8.40	2846.43
c		Lime stone dust	**Ton. km**			1.80	0.00	36.064	8.40	0.00
		Grand Total cost for carriage of material								**1329649.14**

QUANTITY CALCULATION FOR ABUTMENT WALL (A1)

Design Data:

Number of spans	= 1	
Span Length	= 20.56	m
Centre to Centre of span length	= 20.00	m
Number of traffic lanes	= 2	
Overall width of carriageway	= 10.5	m
Overall width bridge	= 13.00	m
Road Crest Level	= 1026.600	m
Percentage of camber	= 2.50	%
Depth of T beam	= 2.000	m
Vertical Clearance	= 12.264	m
Soffit level	= 1024.544	m
Bottom Level of bearing (Top of pedastal)	= 1024.344	m
Top level of abutment cap	= 1024.144	m
Bottom of abutment cap	= 1023.544	m
H.F.L	= **1012.280**	m
Scour level	= **1018.014**	m
Existing groung level	= **1019.082**	m
Abutment stem bottom Level	**= 1017.814**	m
Foundation level	**= 1016.014**	m
Number of main girders	= 4	
Width of cap excluding dirt wall	= 1.08	m
Length of bearing	= 0.6	m
Width of bearing	= 0.6	m
Thickness of bearing	= 0.2	m
Depth of bearing pedastal	= 0.2	m
Depth of abutment cap	= 0.6	m
Depth of abutment wall	= 5.730	m
Number of bearings per support	= 1	
Wearing coat thickness	= 0.056	m
Thickness of return wall	= 0.35	m
Bearing capacity of bed rock	= 300	KN/m^2
Foundation strata	Weathered rock	
Angle of Skew θ	= 0	Degree
Cos q ∓ Sin q 0 =		
Length of span skew	= 20.56	m
Length of abutment wall	= 13	m
Rare slope of stem wall with respect Vertical	= 0	Degree

Abutment Figure



SIDE VIEW OF ABUTMENT WALL A1

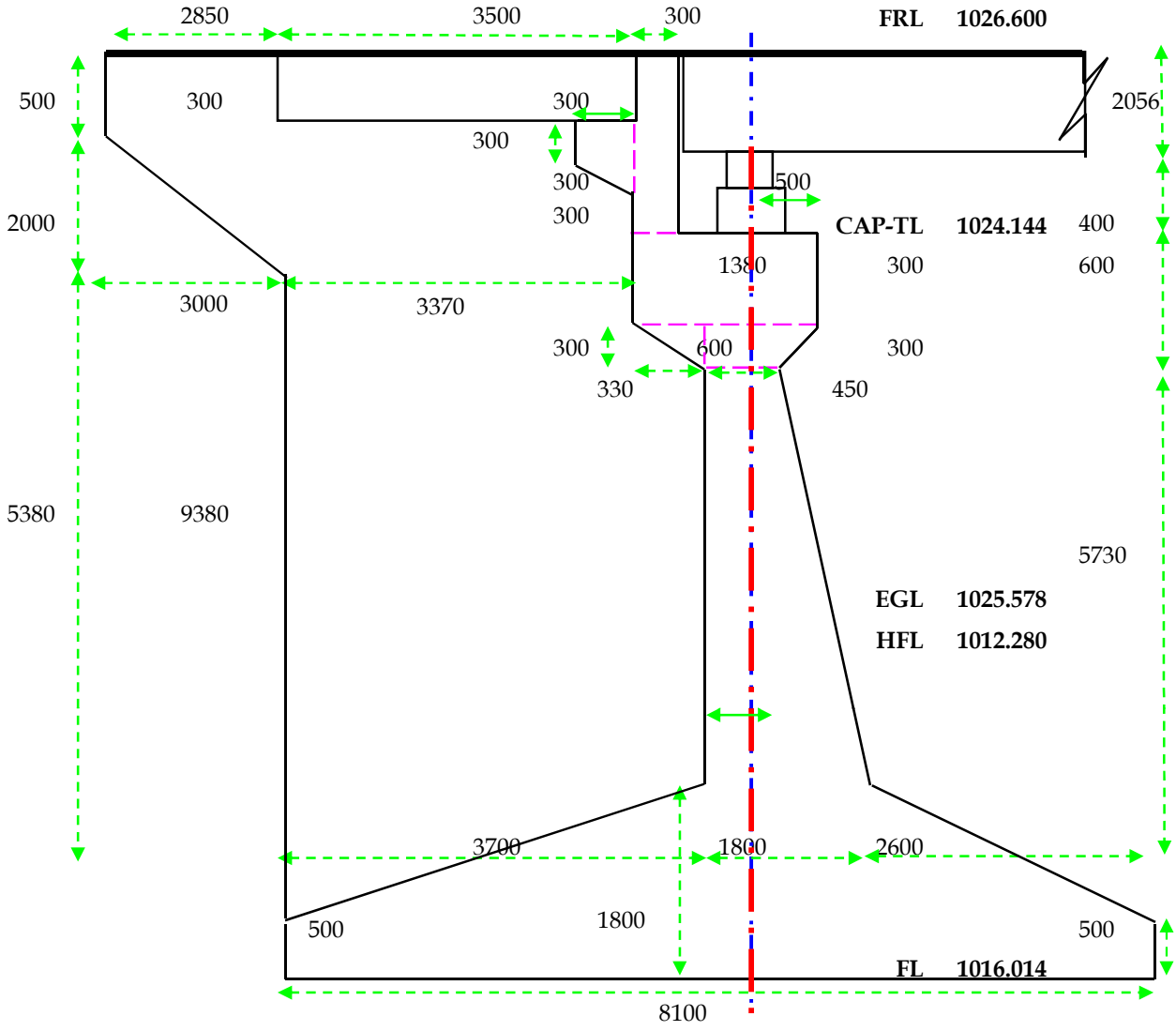
Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	Earthwork for footing						
	up to 3m height from top	Cum	1	11.836	16.736	3.000	594.26
	3m to 6m height from top	Cum	1	8.618	13.518	0.218	25.40
	6m & above from top	Cum	1	8.400	13.300	0.000	0.00
	Total quantity	Cum`					619.66
2	Lean concrete M15 PCC	Cum	1	8.400	13.300	0.150	16.76
3	M15 PCC over toe slab	Cum	1	13.300	2.600	0.850	29.39
4	Footing Slab M30	Cum	1	13.000	8.100	1.150	121.10
	M30 grade concrete for footing	Cum					121.095
	Steel @ 180 kg /Cum	MT					21.797

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
5	**Back fill with filter media**	Cum	1	11.500	0.600	7.380	**50.922**
6	**Back fill with granular media**	Cum	1	11.500	3.100	8.530	**304.094**
7	**Dirt Wall M30**	Cum	1	13.000	0.300	2.400	9.360
8	**Bracket of dirt wall M30**	Cum	1	13.000	0.300	0.450	1.755
9	**Bearing pedestal M30**	Cum	4	0.600	0.600	0.200	0.288
	Seismic arrestor-1 M30	Cum	3	0.500	0.400	1.420	0.852
	Seismic arrestor-2 M30	Cum	2	0.600	0.400	1.420	0.682
10	**Abutment Cap M30**						
	Haunch below dirt wall	Cum	1	13.000	0.990	0.300	1.931
	Full width cap	Cum	1	13.000	1.38	0.300	5.382
11	**Stem M30**	Cum	1	13.000	1.200	5.730	89.388
12	**Wing wall M30**						
	Top rectangular portion	Cum	2	2.850	0.350	0.500	0.998
	Bottom Triangular part	Cum	2	3.000	0.350	1.000	2.100
13	**Return wall M30**						
	Dirt wall part	Cum	2	3.370	0.500	2.700	9.099
	Cap part	Cum	2	3.535	0.500	0.300	1.061
	Stem Part	Cum	2	3.700	0.750	6.030	33.466
14	Front Counter fort	Cum	3	1.300	0.000	2.600	0.000
15	Rear counterfort	Cum	3	2.015	0.000	6.030	0.000
16	Return wall counterfort	Cum	4	1.125	0.000	7.380	0.000
	M30 grade concrete for Substructure	**Cum**					**156.36**
	Steel @ 180 kg /Cum	**MT**					**28.14**
17	**Weep hole**	No	1	78.00			78.00
18	**Bearing**						
	POT CUM PTFE	No	4			4.00	4.00
	Seismic arrestor	Cu cm	5	32.00	20.00	3.20	10240.00
19	**Expansion joint for 50mm**	Rm	1	13.00			13.00
20	**Premoulded expansion joint**	Rm	1	12.30			12.30
21	**Approach slab M30**	Cum	1	3.50	12.30	0.30	12.92
22	**PCC below approach slab M15**	Cum	1	3.65	3.50	0.15	1.92

QUANTITY CALCULATION FOR ABUTMENT WALL (A2)

Design Data:			
Number of spans	=	1	
Span Length	=	20.56	m
Centre to Centre of span length	=	20.00	m
Number of traffic lanes	=	2	
Overall width of carriageway	=	10.5	m
Overall width bridge	=	13.0	m
Road Crest Level	=	1026.600	m
Percentage of camber	=	2.50	%
Depth of composite I girder	=	2.000	m
Vertical Clearance	=	12.264	m
Soffit level	=	1024.544	m
Bottom Level of bearing (Top of pedastal)	=	1024.344	m
Top level of abutment cap	=	1024.144	m
Bottom of abutment cap	=	1023.544	m
H.F.L	=	**1012.280**	m
Scour level	=	**1018.214**	m
Existing groung level	=	**1025.578**	m
Abutment stem bottom Level	**=**	**1017.814**	m
Foundation level	**=**	**1016.014**	m
Number of main girders	=	4	
Width of cap excluding dirt wall	=	1.08	m
Length of bearing	=	0.6	m
Width of bearing	=	0.6	m
Thickness of bearing	=	0.2	m
Depth of bearing pedastal	=	0.2	m
Depth of abutment cap	=	0.6	m
Depth of abutment wall	=	5.730	m
Number of bearings per support	=	1	
Wearing coat thickness	=	0.056	m
Thickness of return wall	=	0.35	m
Bearing capacity of bed rock	=	300	KN/m^2
Foundation strata		Weathered rock	
Angle of Skew θ	=	0	Degree
Cos q ∓ Sin q 0 =			
Length of span skew	=	20.56	m
Length of abutment wall	=	13	m
Rare slope of stem wall with respect Vertical	=	0	Degree

Abutment Figure



SIDE VIEW OF ABUTMENT WALL A2

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	Earthwork for footing						
	up to 3m height from top	Cum	1	24.828	29.728	3.000	2214.26
	3m to 6m height from top	Cum	1	18.828	23.728	3.000	1340.25
	6m & above from top	Cum	1	12.114	17.014	3.714	765.48
	Total quantity	Cum`					4320.00
2	Lean concrete M15 PCC	Cum	1	8.400	13.300	0.150	16.76
3	M15 PCC over toe slab	Cum	1	13.300	2.600	1.050	36.31
4	Footing Slab M30	Cum	1	13.000	8.100	1.150	121.10
	M30 grade concrete for footing	Cum					121.095
	Steel @ 180 kg /Cum	MT					21.797
5	Back fill with filter media	Cum	1	11.500	0.600	7.380	50.922

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
6	**Back fill with granular media**	Cum	1	11.500	3.100	8.530	**304.094**
7	**Dirt Wall M30**	Cum	1	13.000	0.300	2.400	9.360
8	**Bracket of dirt wall M30**	Cum	1	13.000	0.300	0.450	1.755
9	**Bearing pedestal M30**	Cum	4	0.600	0.600	0.200	0.288
	Seismic arrestor-1 M30	Cum	3	0.500	0.400	1.420	0.852
	Seismic arrestor-2 M30	Cum	2	0.600	0.400	1.420	0.682
10	**Abutment Cap M30**						
	Haunch below dirt wall	Cum	1	13.000	0.990	0.300	1.931
	Full width cap	Cum	1	13.000	1.380	0.300	5.382
11	**Stem M30**	Cum	1	13.000	1.200	5.730	89.388
12	**Wing wall M30**						
	Top rectangular portion	Cum	2	2.850	0.350	0.500	0.998
	Bottom Triangular part	Cum	2	3.000	0.350	1.000	2.100
13	**Return wall M30**						
	Dirt wall part	Cum	2	3.370	0.500	2.700	9.099
	Cap part	Cum	2	3.535	0.500	0.300	1.061
	Stem Part	Cum	2	3.700	0.750	6.030	33.466
14	Front Counter fort	Cum	3	1.300	0.000	2.600	0.000
15	Rear counterfort	Cum	3	2.015	0.000	6.030	0.000
16	Return wall counterfort	Cum	4	1.125	0.000	7.380	0.000
	M30 grade concrete for Substructure	**Cum**					**156.36**
	Steel @ 180 kg /Cum	**MT**					**28.14**
17	**Weep hole**	No	1	78.00			78.00
18	**Bearing**						
	POT CUM PTFE	No	4			4.00	4.0
	Seismic arrestor	Cu cm	5	32.00	20.00	3.20	10240.00
19	**Expansion joint for 50mm**	Rm	1	13.00			13.00
20	**Premoulded expansion joint**	Rm	1	12.30			12.30
21	**Approach slab M30**	Cum	1	3.50	12.30	0.30	12.92
22	**PCC below approach slab M15**	Cum	1	3.65	3.50	0.15	1.92

QUANTITY CALCULATION FOR PIER

Sr.No.	Description			Unit	Nos.	Length	Width	Depth	Quantity
1	**Earthwork for foundation**								
		OGL	**Footing Lvl**						
	Pier -1	1016.282	1010.958						
	Up to 3m height from top			Cum	1	15.45	19.25	3.00	892.03
	3m to 6m height from top			Cum	1	9.97	13.77	2.47	339.88
	6m & above from top			Cum	1	7.50	11.30	0.00	0.00
	Pier -2	1008.274	1004.990						
	Up to 3m height from top			Cum	1	12.77	15.37	3.00	588.66
	3m to 6m height from top			Cum	1	9.33	11.93	0.43	48.34
	6m & above from top			Cum	1	8.90	11.50	0.00	0.00
2	**Lean concrete M15 PCC**								
	Pier -1			Cum	1	7.50	11.30	0.5	42.38
	Pier -2			Cum	1	8.90	11.50	0.5	51.18
	Total quantity			**Cum**					**93.55**
3	**PCC filling upto rock level**								
	Pier -1	PCC Filling		Cum	1	7.20	11.00	1.75	138.60
		Footing portion top		Cum	-1	4.60	8.40	1.25	-48.30
		Pier portion		Cum	-1	7.77		0.50	-3.88
	Pier -2	PCC Filling		Cum	1	8.60	11.20	0.75	72.24
		Footing portion top		Cum	-1	5.80	8.50	1.25	-61.63
		Pier portion		Cum	-1	12.41		0.50	-6.20
	Total quantity			**Cum**					**90.83**
4	**Footing M30**								
	Pier -1	**Bottom portion**		Cum	1	7.20	11.00	0.75	59.4
		Top portion		Cum	1	4.60	8.40	1.25	48.3
	Pier -2	**Bottom portion**		Cum	1	8.60	11.20	0.75	72.24
		Top portion		Cum	1	5.80	8.50	1.25	61.625
	Total quantity			**Cum**					**241.565**
	Steel @ 200 kg/Cum			**MT**					**48.313**
5	**Stem M30**								
		Pier Bot level	**Pier Top level**						
	Pier -1	1012.958	1021.213						
		Section-1		Cum	1	7.767		8.26	64.118
	Pier -2	1006.990	1021.214						
		Section-1	Top	Cum	1	7.767		6.22	48.343
		Section-2	Bottom	Cum	1	12.409		8.00	99.270
6	**Pier Cap M30**								
	Pier -1								
	Top rectangular			Cum	1	11.170	3.000	0.750	12.57
	Bottom Trapezoidal			Cum	1	8.835	2.400	1.000	21.20
	Pier -2								
	Top rectangular			Cum	1	11.170	3.000	0.750	12.57
	Bottom Trapezoidal			Cum	1	8.835	2.400	1.000	21.20
7	**Bearing pedestal M30**								
	Pier -1								
	RHS			Cum	4	0.800	0.800	0.200	0.51
	LHS			Cum	4	0.800	0.800	1.631	4.18
	Seismic arrestor-1 M30								
	RHS			Cum	3	0.500	0.000	1.374	0.00
	LHS			Cum	3	0.500	0.866	2.859	3.71

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
	Seismic arrestor-2 M30						
	RHS	Cum	2	0.600	0.400	1.374	0.66
	LHS	Cum	2	0.700	0.500	2.859	2.00
	Pier -2						
	RHS	Cum	4	0.800	0.800	1.631	4.18
	LHS	Cum	4	0.800	0.800	0.200	0.51
	Seismic arrestor-1 M30						
	RHS	Cum	3	0.500	0.866	2.859	3.71
	LHS	Cum	3	0.500	0.000	0.200	0.00
	Seismic arrestor-2 M30						
	RHS	Cum	2	0.700	0.500	2.859	2.00
	LHS	Cum	2	0.600	0.400	1.374	0.66
8	**M30 grade concrete for Substructure**	**Cum**					**301.39**
	Steel @ 220 kg /Cum	**MT**					**66.31**
9	**Bearing**	No					
	POT-CUM PTFE	No	16			16	16
	Seismic arrestor	Cu cm	20	32.00	20.00	3.20	40960.00
10	**Expansion joint for 50mm**	Rm	2	13.00			26.00

QUANTITY CALCULATION FOR SUPER STRUCTURE

Design Data: **No of span**

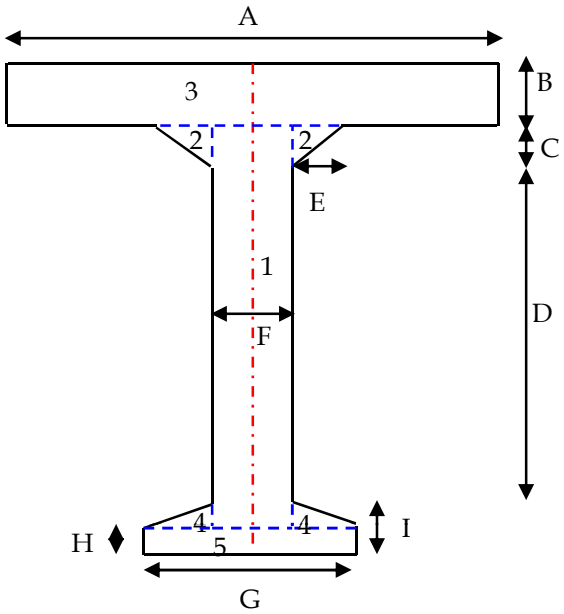
Span Length -Type-1	=	1	49.95	m
Span Length -Type-2	=	2	20.56	
Overall width of carriageway	=		10.5	m
Overall width bridge	=		13.0	m

Sr.No.	Description	Unit	Nos.	Length	Width	Depth	Quantity
1	**RCC Crash Barrier**	Rm	2	98.07	0.34	1.05	69.51
2	**Safety Kerb M40**	Cum	2	98.07	1.25	0.30	72.33
3	**Drainage spout**	No	2	19.00			38.00
4	**Wearing coat in Asphaltic concrete 56 mm thick**	Sqm	1	98.07	10.50		1029.74
5	**50 m Span**						
a	**Main Girder RCC M45**						
	For end portion	Cum	2.00	3.65	2.725		19.90
	for tapered portion	Cum	2.00	2.75	2.036		11.20
	for middle portion	Cum	1.00	36.00	1.347		48.51
	Quantity per girder	Cum					79.60
	Total Quantity	Cum	4.00				318.42
	Deck Slab	Cum	1.00	48.800	13.000	0.266	168.43
	End Slab portion	Cum	2.00	0.575	13.000	0.445	6.65
b	**Cross girders M45**	Cum	3.000	8.190	0.300	2.660	19.61
c	**End Cross Girder M45**	Cum	2.000	6.580	0.450	2.750	16.29
	Total quantity for single span	**Cum**					**529.40**
	Total Nos of span	**Cum**	1.00				529.40
5	**20 m Span T beam**						
	Main Girder RCC M30 for 20 span						
a	**Inner Girder**						
	For end portion	Cum	4	1.780	1.839		13.09
	for tapered portion	Cum	4	1.625	1.644		10.69
	for middle portion	Cum	2	13.750	1.450		39.86
b	**Outer Girder**						
	For end portion	Cum	4	1.780	2.128		15.15
	for tapered portion	Cum	4	1.625	1.958		12.73
	for middle portion	Cum	2	13.750	1.789		49.19
c	**Cross girders M30**	Cum	3	7.449	1.263	0.325	9.17
d	**End Cross Girder M30**	Cum	2	6.552	1.263	0.325	5.38
	Total Quantity per span	Cum					155.27
	Total quantity for 20 m span	**Cum**	**2**				**310.54**
7	**Total Quantity M45 Concrete**	**Cum**					**529.40**
8	**Total Quantity M40 Concrete**	**Cum**					**141.83**
9	**Total Quantity M30 Concrete**	**Cum**					**310.54**
10	**Steel @ 180 kg /Cum for PSC & 160 kg/Cum for RCC**	**MT**					**140.74**
11	**Prestress steel @ 40 kg /Cum**	**MT**					**21.18**

Section properties RCC T-beam Girder for 20.00 m span

Second Moment of Inertia of girder for Running Section (Inner Girder)

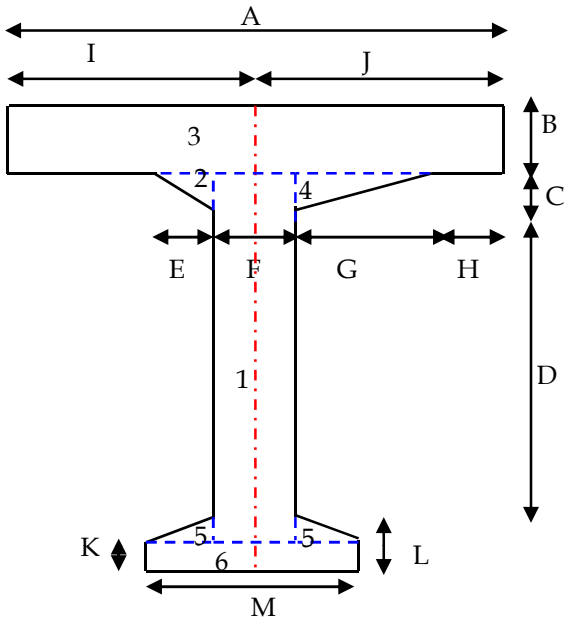
Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.325	1.485	0.482	0.992	0.479	0.475	0.08860
2	Top Hunch	0.300	0.150	0.045	1.685	0.076	0.128	0.000056
3	Top Flange	2.800	0.266	0.743	1.867	1.388	2.592	0.00437
4	Bottom Hunch	0.150	0.150	0.023	0.300	0.007	0.002	0.000028
5	Bottom Flange	0.625	0.250	0.156	0.125	0.020	0.002	0.00081
	Total			**1.450**		**1.969**	**3.199**	**0.094**



Depth of Girder		=	2.000	m
A =	2.800	**Y =**	1.359	m
B =	0.266	**I =**	3.293	m^4
C =	0.150	**I_z =**	0.616	m^4
D =	1.185	**Z_t =**	0.961	m^3
E =	0.300	**Z_b =**	0.46	m^3
F =	0.325	**A =**	1.450	m^2
G=	0.625			
H=	0.250			
I=	0.400			

Second Moment of Inertia of girder for Running Section (Outer Girder)

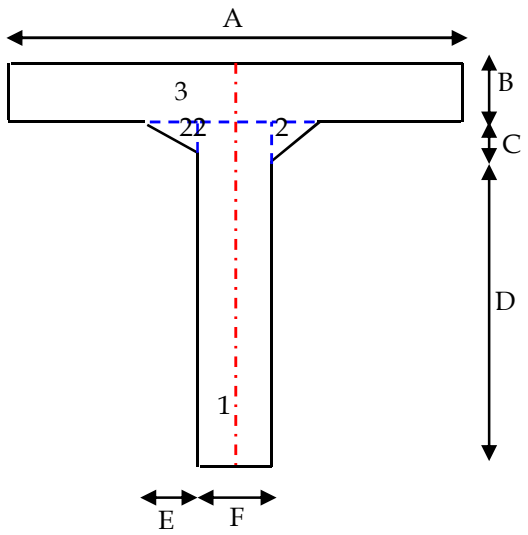
Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.325	1.485	0.482	0.992	0.479	0.475	0.088602
2	Top Hunch	0.300	0.150	0.023	1.685	0.038	0.064	0.000028
3	Top Flange	3.700	0.266	0.982	1.867	1.834	3.425	0.005771
4	Top Hunch	1.638	0.150	0.123	1.685	0.207	0.348	0.000154
5	Bottom Hunch	0.150	0.150	0.023	0.300	0.007	0.002	0.000028
6	Bottom Flange	0.625	0.250	0.156	0.125	0.020	0.002	0.000814
	Total			**1.789**	**6.654**	**2.584**	**4.317**	**0.095**



Depth of Girder		=	2.000	m
A =	3.700	**Y =**	1.445	m
B =	0.266	**I =**	4.413	m^4
C =	0.150	**I_z =**	0.678	m^4
D =	1.185	**Z_t =**	1.222	m^3
E =	0.300	**Z_b =**	0.47	m^3
F =	0.325	**A =**	1.789	m^2
G =	1.638			
H =	0.500	**K =**	0.250	
I =	1.400	**L =**	0.400	
J =	2.300	**M =**	0.625	

Second Moment of Inertia of girder for Support Section (Inner Girder)

Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.625	1.735	1.084	0.867	0.940	0.815	0.271783
2	Top Hunch	0.150	0.075	0.011	1.710	0.019	0.033	0.000004
3	Top Flange	2.800	0.266	0.743	1.867	1.388	2.592	0.004367
	Total			**1.839**	**4.444**	**2.347**	**3.440**	**0.276153**

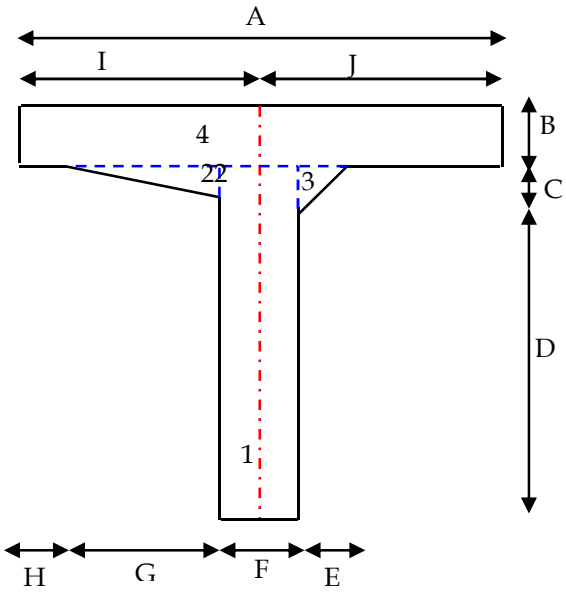


Depth of Girder = 2.000 m

A =	2.800	**Y =**	1.277 m
B =	0.266	**I =**	3.717 m^4
C =	0.075	**I_z =**	0.719 m^4
D =	1.660	**Z_t =**	0.995 m^3
E =	0.15	**Z_b =**	0.57 m^3
F =	0.625	**A =**	1.839 m^2

Second Moment of Inertia of girder for Support Section (Outer Girder)

Sr.No	Description	Length in m	Depth in m	Area m^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Web	0.625	1.735	1.084	0.867	0.940	0.815	0.271783
2	Top Hunch	1.488	0.075	0.056	1.710	0.095	0.163	0.000017
3	Top Hunch	0.150	0.075	0.006	1.710	0.010	0.016	0.000002
4	Top Flange	3.700	0.266	0.982	1.867	1.834	3.425	0.005771
	Total			**2.128**		**2.879**	**4.420**	**0.277572**

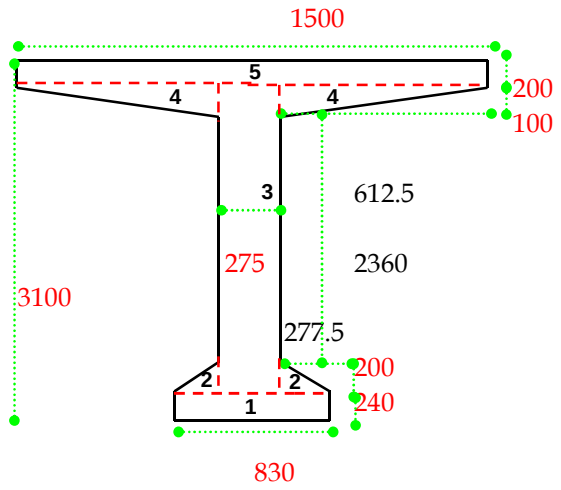


Depth of Girder = 2.000 m

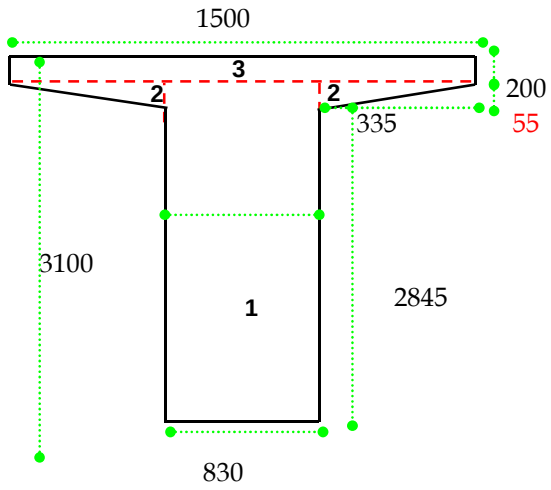
A =	3.700	**I =**	2.300
B =	0.266	**J =**	1.400
C =	0.075	**Y =**	1.354 m
D =	1.660	**I =**	4.698 m^4
E =	0.15	**I_z =**	0.798 m^4
F =	0.625	**Z_t =**	1.236 m^3
G =	1.4875	**Z_b =**	0.59 m^3
H =	0.500	**A =**	2.128 m^2

SECTION PROPERTY FOR 48.0 M SPAN

1 Running Section



2 Support Section



Second Moment of Inertia of girder for Running Section

Sr.No	Description	Length in mm	Depth in mm	Area mm^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Bottom Flange	830	240	1.99E+05	1.20E+02	2.39E+07	2.87E+09	9.56E+08
2	Bottom Hunch	277.5	200	5.55E+04	3.07E+02	1.70E+07	5.22E+09	1.23E+08
3	Web	275	2660	7.32E+05	1.57E+03	1.15E+09	1.80E+12	4.31E+11
4	Top Hunch	612.5	100	6.13E+04	2.87E+03	1.76E+08	5.03E+11	3.40E+07
5	Top Flange	1500	200	3.00E+05	3.00E+03	9.00E+08	2.70E+12	1.00E+09
				1.35E+06	**7.86E+03**	**2.26E+09**	**5.01E+12**	**4.33E+11**

Depth of Girder	=	3100.00	mm	3.100 m
Area **A**	=	1347450.00	mm^2	1.347 m^2
CG from bottom **Y**	=	1680.92	mm	1.681 m
$I = AY^2 + Iself$	=	5.45E+12	mm^4	5.448 m^4
$Iz=I- AxY^2$	=	1.64E+12	mm^4	1.641 m^4

Second Moment of Inertia of girder for Support Section

Sr.No	Description	Length in mm	Depth in mm	Area mm^2 **A**	Distance from Bottom **Y**	**AY**	**AY^2**	**I_{self}**
1	Bottom Flange	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	Bottom Hunch	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1	Web	830	2900	2.41E+06	1.45E+03	3.49E+09	5.06E+12	1.69E+12
2	Top Hunch	335.0	55	1.84E+04	2.88E+03	5.31E+07	1.53E+11	3.10E+06
3	Top Flange	1500	200	3.00E+05	3.00E+03	9.00E+08	2.70E+12	1.00E+09
				2.73E+06	**7.33E+03**	**4.44E+09**	**7.91E+12**	**1.69E+12**

Depth of Girder	=	3100.00	mm	3.100 m
Area **A**	=	2725425.00	mm^2	2.725 m^2
CG from bottom **Y**	=	1630.29	mm	1.630 m
$I = AY^2 + Iself$	=	9.60E+12	mm^4	9.602 m^4
$Iz=I- AxY^2$	=	2.36E+12	mm^4	2.358 m^4

ANALYSIS-1

Sr. No.	Description	Unit	Quantity	Rate Rs	Cost Rs
A1	**Type -1 Side Drain**				
	Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Ref. to MoRTH Technical Specifications 1500, 1700 & 2100				
	PCC Grade M20 ***Unit : cum*** ***Taking output = 15 cum***				
	a) Material				
	Cement	tonne	5.16	9584.21	49454.52
	Coarse sand	cum	6.75	538.20	3632.85
	40 mm Aggregate	cum	5.40	1399	7555
	20 mm Aggregate	cum	5.40	1506.95	8137.53
	10 mm Aggregate	cum	2.70	1372.95	3706.97
	b) Labour				
	Mate	day	0.86	457.65	393.58
	Mason	day	1.50	457.65	686.48
	Mazdoor	day	20.00	355.95	7119.00
	c) Machinery				
	Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	140.35	842.10
	Generator 33 KVA	hour	6.00	467.82	2806.92
	d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery				3373.40
	e) Overhead charges @ 25 % on (a+b+c+d)				21927.1
	f) Contractor's profit @ 10 % on (a+b+c+d+e)				10963.5
	Cost for 15 cum = a+b+c+d+e+f				120599.0
	Rate per cum = (a+b+c+d+e+f)/15				8039.9
				say	**8040.00**
	Cross sectional area of lined drain	sqm			**0.216**
	Rate per running meter	RM			**1736.6**

Description	Unit	Co-efficient	Total quantity	Unit weight	Carriage	Quantity	Rate in Rs	Amount in Rs
Loading and unloading of stone boulder/stone aggregates/sand								
Stone aggregates	**Cum**	0.90	0.22			0.20	105.00	21.00
Sand	**Cum**	0.45	0.22			0.10	105.00	10.50
Cement	**MT**	0.34	0.22			0.08	215.00	17.20
Cost of Haulage Excluding Loading and Unloading								
Surfaced Road								
Cement	**ton. km**				135.00	0.08	6.70	72.36
Stone aggregates	**ton. km**				55.00	0.20	6.70	73.70
Sand	**ton. km**				55.00	0.10	6.70	36.85
Case-II : Unsurfaced Gravelled Road								
a) Cement	**ton. km**				0.00	0.08	8.40	0.00
b) Stone Aggregates	**ton. km**			1.74	2.00	0.20	8.40	5.85
b) Sand	**ton. km**			1.84	2.00	0.10	8.40	3.09

Cost of Carriage of material **240.55**

Grand Total cost per metre length of line drain carriage cost **1977.150**

Rate Analysis for Plum Concrete (1:2:4)

Sr No	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
A2	**Providing & laying Plum concrete in 1:2:4 c.c. (1cement, 2coarse sand, 4clean hard graded stone chips of 20 mm down nominal gauge) with 50% clean hard stone of sizes not exceeding 15cm including shuttering, compacting and curing complete.**					
	Unit = cum					
	Taking output = 15 cum					
	a) Material					
	Cement	tonn	3.45	9584.21	33065.52	M-081
	Coarse sand	cum	3.53	538.20	1899.85	M-005
	Hard selected stone	cum	7.50	559.35	4195.13	M-001
	20 mm Aggregate	cum	5.29	1506.95	7971.77	M-053
	10 mm Aggregate	cum	1.76	1372.95	2416.39	M-051
	b) Labour					
	Mate	day	0.86	457.65	393.58	L-12
	Mason	day	1.50	457.65	686.48	L-11
	Mazdoor	day	15.00	355.95	5339.25	L-13
	c) Machinery					
	Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	140.35	842.10	P&M-009
	Generator 33 KVA	hour	6.00	467.82	2806.92	P&M-079
	d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery				2384.68	
	e) Overhead charges @ 10 % on (a+b+c+d)				5270.14	
	f) Contractor's profit @ 10 % on (a+b+c+d+e)				6727.18	
	Cost for 15 cum = a+b+c+d+e+f				73998.99	
	Rate per cum = (a+b+c+d+e+f)/15				4933.27	
				say	***4934.00***	

ANALYSIS - 3

Sr. No	Description	Unit	Quantity	Rate in Rs.	Amount in Rs.
A3	Laying Reinforced cement concrete pipe NP4/prestressed concrete pipe for culverts on cement concrete craddle beding in single row including flush joint with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets,complete as per drawing and Technical Specifications 2900 *Unit = metre* *Taking output = 12.5 metres (5 pipes of 2.5 m length each)* **1200 mm dia**				
	a) Labour				
	Mate	day	0.280	457.650	128.14
	Mason	day	1.000	457.650	457.65
	Mazdoor	day	6.000	355.950	2135.70
	b) Material				
	Sand at site	cum	0.090	538.20	48.44
	Cement at site	MT	0.070	9584.21	670.89
	RCC pipe NP-4/prestressed concrete pipe including collar at site	Rm	12.500	9473.36	118417.00
	c) Overhead charges @ 10 % on (a+b)				12185.78
	d) Contractor's profit @ 10 % on (a+b+c)				13404.36
	Cost for 12.5 metres = a+b+c+d				147447.96
	Rate per metre= (a+b+c+d)/12.5				11795.84
				say	**11796.00**

ANALYSIS- 03

A3	Spreading & Compaction of Roadway cutting and excavation from drain and foundation of other structures surplus material at selected displosal location by Dozer at least four passes.				
	Unit = cum				
	Taking output = 100 cum				
	a) Labour				
	Mate	day	0.020	457.65	9.15
	Mazdoor	day	0.500	355.95	177.98
	b) Machinery				
	Dozer D-50 for spreading & compaction@ 300 cum per hour	hour	0.330	2689.97	887.69
	c) Overhead charges @ 10 % on (a+b)				107.48
	d) Contractor's profit @ 10 % on (a+b+c)				118.23
	Rate for 100 cum = a+b+c+d				1300.53
	Rate per cum = (a+b+c+d)/100				13.01
				say	***13.00***

Rate analysis for Vetiver Grass

Sr No	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
A4	**Vetiver grass**					
	Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer,including watering for 3 months all as per clause 308.					
	Unit = sqm					
	Taking output = 240 sqm					
	a) Labour					
	Mate	day	0.400	457.65	183.06	L-12
	Mazdoor	day	10.000	355.95	3559.50	L-13
	b) Machinery					
	Water tanker 6 KL capacity including watering for 3 months	hour	14.000	350.87	4912.18	P&M-060
	Tractor-trolley	hour	2.400	415.19	996.46	P&M-053
	c) Material					
	Seeds	kg	3.600	75.00	270.00	
	Sludge/Farm yard manure @ 0.18 cum per 100 sqm	cum	0.430	350.87	150.87	M-167
	Cost of water for 3 months	KL	84.000	244.08	20502.72	M-189
	d) Overhead charges @ 0.085 on (a+b+c)				4132.34	
	e) Contractor's profit @ 0.075 on (a+b+c+d)				3956.11	
	Cost for 240 sqm = a+b+c+d+e				38663.24	
	Rate per sqm = (a+b+c+d+e)/240				161.10	
				say	***161.10***	

A5- Analysis of Rate for Non woven Coir Blanket

Sr.No	Description	Unit	Quantity	Rate in Rs.	Amount in Rs.
	Supply and Installation of Non woven Coir Erosion Control Blanket for slope surface erosion protection including labours, tools and tackels complete as per the Technical specification mentioned in the tender document.				
	Unit = Square metre				
	Taking output = 1.0 Square metres				
	a) Labour				
	Mate	day	0.083	457.65	37.98
	Mazdoor	day	0.500	355.95	177.98
	b) Machinery				
	Water tanker 6 KL capacity including watering for 3 months	hour	0.050	350.87	17.54
	Tractor-trolley	hour	0.050	415.19	20.76
	c) Material				
	Supply of non-woven coir erosion control blanket as per Technical Specification	Sqm	1.000	45.00	45.00
	Non-woven coir erosion control blanket 15% extra for trenching and overlapping on the effective slope face area	Sqm	1.000	7.00	7.00
	GI "U" Hook - 1 No. per Sqmtr of effective slope face area having size of 12"x3"x12" with 3.5mm-3.8mm diameter	Sqm	1.000	27.00	27.00
	Native Grass Seeds of approx. 1Kg per 9Sqm of effective slope face area	Sqm	1.000	38.00	38.00
	Sourcing of top soil (including transportation if it is available in close proximity, the cost may vary if the distance is more)	Sqm	1.000	30.00	30.00
	Cow dung manure	Sqm	1.000	7.00	7.00
	Live Sticks	Sqm	1.000	7.00	7.00
	d) Overhead charges @ 10 % on (a+b+c)				41.53
	e) Contractor's profit @ 10 % on (a+b+c+d)				45.68
	Cost for 1 sqm = a+b+c+d+e				502.47
	Rate per sqm = (a+b+c+d+e)				502.47
				say	***502.00***

A. Type-A (300 mm x 300 mm) 2,000 mm x 2,000 mm - span

1. Quantity per 4.0 m2 construction

Concrete (M25) :	0.33	m3
Reinforcement Bar (D12):	17.05	kg
Anchor Pin (D12, 400 mm):	1.60	m
	1.42	kg
Anchor Bar (D20, 500 mm):	0.50	m
	1.23	kg
Formwork	2.04	m2
Hydroseeding	2.89	m2

2. Cost Estimation for Concrete Crib

(1) Surface Treatment (100 m2)

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	0.80	1,200	960.0
Common Worker	man-day	2.00	400	800.0
Backhore	hor	4.00	2,700	10,800.0
sub-total:				12,560.0
			cost of 4.0 m2 :	502.4

(2) Formwork (100 m2)

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	3.50	1,200	4,200.0
Skill Worker (Slope)	man-day	13.50	600	8,100.0
Common Worker	man-day	11.10	400	4,440.0
Crane	day	0.80	8,768	7,014.4
Metal Form	m2	100.00	24	2,400.0
Miscellaneous Expense	5.00%			837.0
sub-total:				26,991.4
			cost of 4.0 m2 :	550.6

(3) Anchoring

1) Anchor Pin : D12 x 400 mm (100 hole)

Drilling :	46	mm
grount volune per 1 hole:	0.0017	m3

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	0.80	1,200	960.0
Skill Worker (Slope)	man-day	3.30	600	1,980.0
Common Worker	man-day	0.80	400	320.0
Boring Machine	day	0.80	4,452	3,561.6
Down the Hole Hammer	day	0.80	5,488	4,390.4
Air Compressor	day	0.80	5,797	4,637.6
Generator	day	0.80	7,629	6,103.2
Reinforcement Bar	kg	35.50	92	3,266.0
Grount	m3	0.170	13,438	2,284.5
Miscellaneous Expense	15.0 % of dirining equipment			1,192.8
sub-total:				28,696.1
			cost of 4.0 m2 :	1,147.8

2) Anchor Bar : D20 x 500 mm (100 hole)

Drilling : 46 mm

grount volune per 1 hole: 0.0021 m3

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	1.10	1,200	1,320.0
Skill Worker (Slope)	man-day	4.40	600	2,640.0
Common Worker	man-day	1.10	400	440.0
Boring Machine	day	1.10	4,452	4,897.2
Down the Hole Hammer	day	1.10	5,488	6,036.8
Air Compressor	day	1.10	5,797	6,376.7
Generator	day	1.10	7,629	8,391.9
Reinforcement Bar	kg	123.00	92	11,316.0
Grount	m3	0.210	13,438	2,822.0
Miscellaneous Expense	15.0 % of dirining equipment			1,640.1
sub-total:				45,880.7
			cost of 4.0 m2 :	458.8

(4) Concreting (100m3)

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	3.80	1,200	4,560.0
Skill Worker (Slope)	man-day	8.80	600	5,280.0
Common Worker	man-day	13.90	400	5,560.0
Concrete (M25)	m3	111.00	14,852	1,648,572.0
Reinforcement Bar	kg	6,458.33	92	594,166.4
Concrete Pump	hour	2.00	336	672.5
Miscellaneous Expense	15.0 % of labor cost			2,310.0
sub-total:				2,261,120.9
			cost of 4 m2 :	7,461.7

(5) Stet-up and Removal of Scaffolding (100 m3 of scaffolding)

total scaffolding (4 m2): 3 m3

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	2.94	600	1,764.0
Skill Worker (Slope)	man-day	8.82	600	5,292.0
Common Worker	man-day	5.88	400	2,352.0
Lease of Scaffolding Material				1,000.0
Miscellaneous Expense	8.00%			752.6
sub-total:				11,160.6
			cost of 4 m2 :	334.8

3. Construciton Cost of 4 m2

Item	Cost (Rs.)
1. Surface Treatment	502
2. Formwork	551
3 Anchoring	
1) Anchor Pin (D12 x 400 mm)	1,148
2) Anchor Bar (D20 x 500 mm)	459
4. Concreting	7,462
5. Stet-up and Removal of Scaffolding	335
6. Hydroseeding	434
Total Direct Cost (4 m2) :	10,891
Overhead (10 %) :	1,089
Profit (10 %) :	1,089
Total Cost (4 m2):	**13,069**
Unit Cost (per m2) :	**3,267**

B. Type-B (500 mm x 500 mm) 3,000 mm x 3,000 mm - span

1. Quantity per 9.0 m2 construction

Concrete (M25) :	1.38	m3
Reinforcement Bar (D20):	118.38	kg
Reinforcement Bar (D12):	5.68	kg
Anchor Pin (D16, 600 mm):	2.40	m
	3.79	kg
Anchor Bar (D20, 800 mm):	0.80	m
	1.97	kg
Formwork	5.00	m2
Hydroseeding	6.25	m2

2. Cost Estimation for Concrete Crib

(1) Surface Treatment (100 m2)

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	0.80	1,200	960.0
Common Worker	man-day	2.00	400	800.0
Backhore	hor	4.00	2,700	10,800.0
sub-total:				12,560.0
			cost of 9.0 m2 :	1,130.4

(2) Formwork (100 m2)

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	3.50	1,200	4,200.0
Skill Worker (Slope)	man-day	13.50	600	8,100.0
Common Worker	man-day	11.10	400	4,440.0
Crane	day	0.80	8,768	7,014.4
Metal Form	m2	100.00	24	2,400.0
Miscellaneous Expense	5.00%			837.0
sub-total:				26,991.4
			cost of 9.0 m2 :	1,349.6

(3) Anchoring

1) Anchor Pin : D16 x 600 mm (100 hole)

Drilling :	46	mm
grount volune per 1 hole:	0.0025	m3

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	1.10	1,200	1,320.0
Skill Worker (Slope)	man-day	4.40	600	2,640.0
Common Worker	man-day	1.10	400	440.0
Boring Machine	day	1.10	4,452	4,897.2
Down the Hole Hammer	day	1.10	5,488	6,036.8
Air Compressor	day	1.10	5,797	6,376.7
Generator	day	1.10	7,629	8,391.9
Reinforcement Bar	kg	35.50	92	3,266.0
Grount	m3	0.250	13,438	3,359.5
Miscellaneous Expense	15.0 % of dirining equipment			1,640.1
sub-total:				38,368.2
			cost of 9.0 m2 :	1,534.7

2) Anchor Bar : D20 x 800 mm (100 hole)

Drilling : 46 mm

grount volune per 1 hole: 0.0033 m3

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	1.10	1,200	1,320.0
Skill Worker (Slope)	man-day	4.40	600	2,640.0
Common Worker	man-day	1.10	400	440.0
Boring Machine	day	1.10	4,452	4,897.2
Down the Hole Hammer	day	1.10	5,488	6,036.8
Air Compressor	day	1.10	5,797	6,376.7
Generator	day	1.10	7,629	8,391.9
Reinforcement Bar	kg	123.00	92	11,316.0
Grount	m3	0.330	13,438	4,434.5
Miscellaneous Expense	15.0 % of dirining equipment			1,640.1
sub-total:				47,493.2
			cost of 9.0 m2 :	474.9

(4) Concreting (100m3)

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	3.80	1,200	4,560.0
Skill Worker (Slope)	man-day	8.80	600	5,280.0
Common Worker	man-day	13.90	400	5,560.0
Concrete (M25)	m3	111.00	14,852	1,648,572.0
Reinforcement Bar	kg	11,237.32	92	1,033,833.4
Concrete Pump	hour	2.00	336	672.5
Miscellaneous Expense	15.0 % of labor cost			2,310.0
sub-total:				2,700,787.9
			cost of 9 m2 :	37,270.9

(5) Stet-up and Removal of Scaffolding (100 m3 of scaffolding)

total scaffolding (9 m2): 6 m3

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	2.94	600	1,764.0
Skill Worker (Slope)	man-day	8.82	600	5,292.0
Common Worker	man-day	5.88	400	2,352.0
Lease of Scaffolding Material				1,000.0
Miscellaneous Expense	8.00%			752.6
sub-total:				11,160.6
			cost of 9 m2 :	669.6

3. Construciton Cost of 9 m2

Item	Cost (Rs.)
1. Surface Treatment	1,130.4
2. Formwork	1,350
3 Anchoring	
1) Anchor Pin (D16 x 600 mm)	1,535
2) Anchor Bar (D20 x 800 mm)	475
4. Concreting	37,271
5. Stet-up and Removal of Scaffolding	670
6 Hydroseeding	434
Total Direct Cost (9 m2) :	42,865
Overhead (10 %) :	4,287
Profit (10 %) :	4,287
Total Cost (9 m2):	**51,439**
Unit Cost (per m2) :	**5,715**

Rate Analysis of Gabion Reinforced wall with Geogrid

Sl.No.	Description of Items	Units	No.	Length	Breadth	Height	Qty	Rate	Amount
1	Supply and placing of gabion facia with integrated tail length 2m as secondary reinforcement for Reinforced soil system, made of Mechanically Woven Double Twisted Hexagonal Shaped Wire Mesh per IS 16014:2012 and MoRTH (Fifth Revision) Clause 3100, Mesh Type 10x12, Zn+10%Al alloy +PVC coated Mesh Wire dia. 2.7/3.7mm (ID/OD), mechanically edged / selvedged, with partitions at 1m interval, tying with lacing wire of dia 2.2/3.2 mm (ID/OD).	Cum	1	80	1	8	640	3937.000	2519680.00
2	Geogrid or Paralink (Uniaxle direction) of 200KN/m or GG200 (Breadth of Each roll=4.5m) , vertical spacing 1.0m Sq.m (10% extra Geogrid is added for Curvature & Overlap)	Sq.m	8	4	80		2560	326.000	834560.00
3	Geogrid 40 kN/m (Biaxial Direction) (Breadth of each roll =3.95m) ,vertical spacing 0.5m for strengthing of soil at sinking portion	Sq.m	8	80	6		3840	326.000	1251840.00
4	Non woven Geotextile behind the Gabion 150 GSM 3 Sq.m Geotextile is required for each box	Sq.m	1	80		8	640	55.000	35200.00
5	Non woven Geotextile behind Chimney drain 150 GSM both side i.e retained side & structural fill side	Sq.m	2	80		8	1280	55.000	70400.00
6	110mm Dia, Cl-2 (4.00 Kg. Pres.) 6 Mtr. Long UPVC Pipe (Perforated 8-10 Perforated @ 75mm Triangular Grid) (As per IS Specification No. 4985/2000)	Rm	24	12			288	432.730	124626.24
7	Non woven Geotextile for wrap around the pipe 150 GSM 3.9 Sq.m per pipe of 6 m length, No of pipe i) Transverse direction@5 m c/c =(80/5+1) = 17 nos. & longitudional pipe = 80m = 14 nos. @6m length Total Pipe of 6m length = (17+14) = 31 nos.	Sq.m					120.9	55.000	6649.50

Rate Analysis of Gabion Reinforced wall with Geogrid									
Sl.No.	**Description of Items**	**Units**	**No.**	**Length**	**Breadth**	**Height**	**Qty**	**Rate**	**Amount**
8/13.10	Providing and laying of Filter media for Chimney drain 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.	Cum	1	80	0.6	8	384	1291.000	495744.00
						Total			**5338699.74**

Cost for 80.00m and 8.0 m Height = Rs. 5,338,700

Cost per Square meter = Rs. 8,342

Say = Rs. 8,342

Analysis of Rate for Gabion RE Wall Item

Sr No	Description	Unit	Quantity	Rate Rs	Cost Rs
A1	**Gabian Structure for Retaining Earth**				
	Supply and placing of gabion facia with integrated tail length 2m as secondary reinforcement for Reinforced soil system, made of Mechanically Woven Double Twisted Hexagonal Shaped Wire Mesh per IS 16014:2012 and MoRTH (Fifth Revision) Clause 3100, Mesh Type 10x12, Zn+PVC coated Mesh Wire dia. 2.7/3.7mm (ID/OD), mechanically edged / selvedged, with partitions at 1m interval, tying with lacing wire of dia 2.2/3.2 mm (ID/OD).				
	Unit = cum				
	Taking output = 6 x 2.0 x 1.0 x 1.0 = 12.00 cum				
	a) Labour				
	Mate	day	0.28	457.65	128.14
	Mazdoor	day	5.00	355.95	1779.75
	Mazdoor (Skilled)	day	2.00	406.80	813.60
	b) Material				
	Mesh Type 10x12, Zn+PVC coated Mesh Wire dia. 2.7/3.7mm (ID/OD), mechanically edged / selvedged, with partitions at 1m interval, tying with lacing wire of dia 2.2/3.2 mm (ID/OD).	sqm	61.00	380.00	23180.00
	Stone boulders with least dimension of 200 mm	cum	12.60	559.35	7047.81
	Stone spalls of minimum size 25 mm	cum	2.52	559.35	1409.56
	c) Overhead charges @ 25 % on (a+b)				8589.72
	d) Contractor's profit @ 10 % on (a+b+c)				4294.86
	Cost for 12.0 cum (a+b+c+d)				47243.44
	Rate per Cum (a+b+c+d)/12.00				3936.95
				say	***3937.00***
A2	**Geogrid (Uniaxle direction) of 200KN/m or GG200**				
	Unit = sqm				
	Taking output = 300 sqm				
	a) Labour				
	Mate	day	0.360	457.65	164.75
	Mazdoor	day	6.000	355.95	2135.70
	Mazdoor skilled	day	3.000	406.80	1220.40
	b) Material				
	Synthetic Geogrids as per clause 3102.8 and approved design and specifications.	sqm	300.000	233.91	70173.00
	Add 10 per cent of the cost of reinforcing elements (synthetic geogrids) for accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the facia pannels, overlaps and other protective elements for synthetic geogrids.				7017.30
	c) Overhead charges @ 10 % on (a+b)				8071.12
	d) Contractor's profit @ 10 % on (a+b+c)				8878.23
	Cost of 300 sqm of Synthetic geogrids = a+b+c+d				97660.50
	Rate per sqm = (a+b+c+d)/ 300				325.54
				say	***326.00***

Analysis of Rate for Gabion RE Wall Item

Sr No	Description	Unit	Quantity	Rate Rs	Cost Rs
A3	**Geogrid 40 kN/m (Biaxial Direction)**				
	Unit = sqm				
	Taking output = 300 sqm				
	a) Labour				
	Mate	day	0.360	457.65	164.75
	Mazdoor	day	6.000	355.95	2135.70
	Mazdoor skilled	day	3.000	406.80	1220.40
	b) Material				
	Synthetic Geogrids as per clause 3102.8 and approved design and specifications.	sqm	300.000	233.91	70173.00
	Add 10 per cent of the cost of reinforcing elements (synthetic geogrids) for accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the facia pannels, overlaps and other protective elements for synthetic geogrids.				7017.30
	c) Overhead charges @ 10 % on (a+b)				8071.12
	d) Contractor's profit @ 10 % on (a+b+c)				8878.23
	Cost of 300 sqm of Synthetic geogrids = a+b+c+d				97660.50
	Rate per sqm = (a+b+c+d)/ 300				325.54
				say	***326.00***

Material Transport for Gabion RE Wall

Sr No	Description	Unit	Quantity	Rate Rs	Cost Rs
1	**Terramesh unit (Gabion facia)**				
	Basic Cost of Material per Gabion facia unit	Nos	1	1800.00	1800.00
	GST @ 18				324.00
	Loading & Unloading	Nos	1	35.00	35.00
	Transportion of Material from Ex factory to Project Site	Nos	1	120.00	120.00
	Cost of facia at site	Nos			2279.00
	Area of each unit of Gabion facia - 6sqm	Sqm			379.83
				Say	**380.00**
2	**Geo grid (Uniaxle Direction)**				
	Basic Cost of Geo grid (Uniaxle Direction) Material	Sqm	1	210.00	210.00
	GST @ 18				37.80
	Loading & Unloading	Nos	1	10.00	10.00
	Transportion of Material from Ex factory to Project Site	Nos	1	18.00	18.00
	Cost of Geo grid (Uniaxle Direction) at site	Nos			275.80
				Say	**276.00**
3	**Geo grid (Biaxial Direction)**				
	Basic Cost of Geo grid (Biaxial Direction) Material	Sqm	1	150.00	150.00
	GST @ 18				27.00
	Loading & Unloading	Nos	1	10.00	10.00
	Transportion of Material from Ex factory to Project Site	Nos	1	18.00	18.00
	Cost of Geo grid (Biaxial Direction) at site	Nos			205.00
				Say	**205.00**
4	**Non - woven Geotextile**				
	Basic Cost of Non - woven Geotextile Material	Sqm	1	40.00	40.00
	GST @ 12				4.80
	Loading & Unloading	Nos	1	2.00	2.00
	Transportion of Material from Ex factory to Project Site	Nos	1	8.00	8.00
	Cost of Non - woven Geotextile at site	Nos			54.80
				Say	**55.00**

ROCK BOLT (25 mm)

Sr. No.	Description	Cmputation / Reference	Quantity/ Cost	Unit
1	**Drilling & Bolting**			
	One boom drill jumboo			
	Ideal production rate		50	Rm/hr
	Overall efficiency		70%	
	Actual production rate		35	Rm/hr
	Hourly use rate	Refer analysis of Hourly use rates of machines/	9935.18	Rs./hr.
	Rate of drilling	Hourly use rates/Actual production rate	283.86	Rs./Rm
	Cost of drill rod per metre drilling		284.38	Rs./Rm
	Light ,ventilation & workshop charges LS		35.00	Rs./Rm
	Total of drilling and Bolting		**603.24**	**Rs./Rm**
2	**Supply and making the Bolts**			
(i)	Rock bolts 25 mm dia ,3.86 Kg per Rm		231.6	Rs./Rm
(ii)	Wastage in cutting 2.5 % of (i) above		5.79	Rs./Rm
(iii)	Cutting & making tip,L.S.		15	Rs.
(iv)	Threading , L.S.		15	Rs.
(v)	Cost of nut and plate,L.S.		25	Rs.
	Total of supply and making of Bolts		**292.39**	**Rs./Rm**
3	**Instation**			
(i)	Grouting rock bolt,L.S.		15	Rs.
(ii)	Miscellaneous work,L.S.		15	Rs.
(iii)	Resin Capsule		50	Rs.
	Total Installation		**80.00**	**Rs./Rm**
4	**Prime cost**	**Sr.no. 1+2+3**	**975.63**	**Rs./Rm**
5	Overhead charges & contractor's profit @ 20% of prime cost	20 % of total sr.no. 4	195.13	**Rs./Rm**
6	Contractors profit @ 10% on (4+5)		117.08	**Rs./Rm**
		Rate per Rm	1287.84	**Rs./Rm**
		Rate per Rm (Say)	**1288.00**	**Rs./Rm**

1. Condition of Cost Estimation

[Total Length of Anchor]	10.0 m	
- Gravel Soil :	(7.0 m)	
- Soft Rock :	(3.0 m)	
[Interval of Anchor]	2.0 m	
[Drilling Method]	Double Casing Boring	
[Type of Anchor Cable]	Prestressed Strand Wire Cable	45.6 (7 x 15.2)
[Diameter of Drilling]	135	

2. Cost Estimation for Earth Anchor

(1) Drilling (per 10 m)

1) Gravel Soil

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	0.55	1,200	660.0
Skill Worker	man-day	0.55	600	330.0
Common Worker	man-day	1.10	400	440.0
Boring Machine	day	0.55	33,801	18,590.6
Generator	day	0.55	6,000	3,300.0
Boring Equipment				
- Shank Rod	nos	0.04	34,891	1,395.6
- Cleaning Adapter	nos	0.03	62,305	1,869.2
- Extension Rod	nos	0.04	23,728	949.1
- Drill Pipe (1.5 m)	piece	0.20	34,891	6,978.2
- Inner Rod (1.5 m)	piece	0.22	20,509	4,512.0
- Ring Bit	nos	0.20	36,345	7,269.0
- Inner Bit	nos	0.16	25,441	4,070.6
- Water Swivel	nos	0.02	78,401	1,568.0
Miscellaneous Expense	15.0 % of drilling machine / labor			3,003.1
sub-total:				54,935.4
			cost of 10 m :	38,454.8

2) Soft Rock

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	0.66	1,200	792.0
Skill Worker	man-day	0.66	600	396.0
Common Worker	man-day	1.32	400	528.0
Boring Machine	day	0.66	33,801	22,308.7
Air Compressor	day	0.66	5,500	3,630.0
Generator	day	0.66	6,000	3,960.0
Boring Equipment				
- Shank Rod	nos	0.05	34,891	1,744.6
- Cleaning Adapter	nos	0.04	62,305	2,492.2
- Extension Rod	nos	0.05	23,728	1,186.4
- Drill Pipe (1.5 m)	piece	0.29	34,891	10,118.4
- Inner Rod (1.5 m)	piece	0.34	20,509	6,973.1
- Ring Bit	nos	0.24	36,345	8,722.8
- Inner Bit	nos	0.16	25,441	4,070.6
- Water Swivel	nos	0.02	78,401	1,568.0
Miscellaneous Expense	15.0 % of drilling machine / labor			3,603.7
sub-total:				72,094.5
			cost of 10 m :	21,628.4

(2) Assembling and Installing Anchor (per 10 location)

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	4.35	1,200	5,220.0
Skill Worker (Slope)	man-day	4.35	600	2,610.0
Common Worker	man-day	8.70	400	3,480.0
Miscellaneous Expense	3.0 % of labor cost			339.3
sub-total:				11,649.3
			cost of 10 m :	1,164.9

(3) Grouting (per 10.0 m3)

grount volune per 1 hole: 0.3149 m3

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	2.44	1,200	2,928.0
Skill Worker (Slope)	man-day	2.44	600	1,464.0
Common Worker	man-day	4.88	400	1,952.0
Grount	m3	10.00	13,438	134,380.0
Miscellaneous Expense	23.0 % of labor cost			1,459.1
sub-total:				142,183.1
			cost of 10 m :	4,477.3

(4) Moving to Next Achor Location (10 times)

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	3.13	1,200	3,756.0
Skill Worker	man-day	3.13	600	1,878.0
Common Worker	man-day	6.25	400	2,500.0
Crane (25 ton)	day	3.13	8,768	27,443.8
sub-total:				35,577.8
			cost of 10.0 m :	3,557.8

(5) Tensioning, Fixing and Anchor Head Treatment (per 10 location)

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	7.14	1,200	8,568.0
Skill Worker (Slope)	man-day	7.14	600	4,284.0
Common Worker	man-day	14.29	400	5,716.0
Miscellaneous Expense	19.0 % of labor cost			3,527.9
sub-total:				22,095.9
			cost of 10 m :	2,209.6

(6) Stet-up and Removal of Scaffolding (100 m3 of scaffolding)

total scaffolding (4 m2/ location): 3 m3

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Foreman	man-day	2.94	1,200	3,528.0
Skill Worker (Slope)	man-day	8.82	600	5,292.0
Common Worker	man-day	5.88	400	2,352.0
Lease of Scaffolding Material				1,000.0
Miscellaneous Expense	8.0 %			893.8
sub-total:				13,065.8
			cost of 4 m2 :	392.0

(7) Material Cost of Anchor (1 location : 10 m)

Item	Unit	Q'ty	Unit Cost (Rs.)	Price (Rs.)
Strad Cable with Sheath	m	9.00	2,318	20,862.0
Machon	set	1.00	51,750	51,750.0
Anchor Cap	nos	1.00	4,933	4,933.0
Anchor Plate	nos	1.00	3,790	3,790.0
sub-total:				81,335.0
			cost of 10 m :	81,335.0

3. Construciton Cost of 10.0 m (1 location)

Item	Cost (Rs.)
1. Drilling	
- Gravel Soil	38,455
- Soft Rock	21,628
2. Assembling and Installing Anchor	1,165
3. Grouting	4,477
4. Moving to Next Achor Location	3,558
5. Tensioning, Fixing and Anchor Head Treatme	2,210
6. Stet-up and Removal of Scaffolding	392
7. Material Cost of Anchor	81,335
Total Direct Cost (10.0 m) :	153,220
Overhead (10 %) :	15,322
Profit (10 %) :	15,322
Total Cost (10.0 m):	**183,864**
Unit Cost (per m) :	**18,386**

DETAILED PROJECT REPORT FOR WIDENING TO 2-LANE OF NH 510 (SINGTAM-TARKU-RABONGLA-LEGSHIP-GYALSHING) IN THE STATE OF SIKKIM

Name of Road :NH-510 within Sikkim (Km 58+840 to Km- 75+000)

Length of road : 16.16 Km

Earth Work Quantity Calculation

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
1	58840	2.757	0.000	0.000	0.000	0.000	0.000	BR
2	58850	2.799	0.182	27.780	0.000	0.000	0.000	BR
3	58860	3.217	0.000	30.080	0.000	0.000	0.000	BR
4	58870	2.624	0.000	29.205	0.000	0.000	0.000	BR
5	58880	0.025	0.588	13.245	0.000	0.000	0.000	BR
6	58890	0.031	2.510	0.280	0.000	0.000	0.000	BR
7	58900	0.630	0.148	3.305	0.000	0.000	0.000	BR
8	58910	3.068	0.000	18.490	0.000	0.000	0.000	BR
9	58920	2.535	1.481	28.015	0.000	0.000	0.000	BR
10	58930	1.628	2.017	20.815	0.000	0.000	0.000	BR
11	58940	3.773	0.000	27.005	10.085	0.000	10.085	NH-510
12	58950	3.851	0.149	38.120	0.745	0.000	0.745	NH-510
13	58960	0.368	1.771	21.095	9.600	0.000	9.600	NH-510
14	58970	1.232	1.069	8.000	14.200	0.000	14.200	NH-510
15	58980	7.370	1.068	0.000	0.000	0.000	0.000	NL Road
16	58990	14.045	1.955	0.000	0.000	0.000	0.000	NL Road
17	59000	23.098	0.647	0.000	0.000	0.000	0.000	NL Road
18	59010	0.140	5.611	0.000	0.000	0.000	0.000	NL Road
19	59020	0.131	6.161	0.000	0.000	0.000	0.000	NL Road
20	59030	1.917	5.361	0.000	0.000	0.000	0.000	NL Road
21	59040	2.119	7.083	0.000	0.000	0.000	0.000	NL Road
22	59050	0.521	6.729	0.000	0.000	0.000	0.000	NL Road
23	59060	0.000	3.321	0.000	0.000	0.000	0.000	NL Road
24	59070	5.860	1.065	0.000	0.000	0.000	0.000	NL Road
25	59080	2.770	0.000	0.000	0.000	0.000	0.000	NL Road
26	59090	3.421	0.000	0.000	0.000	0.000	0.000	NL Road
27	59100	6.474	0.000	0.000	0.000	0.000	0.000	NL Road
28	59110	1.363	0.458	0.000	0.000	0.000	0.000	NL Road
29	59120	4.327	0.000	0.000	0.000	0.000	0.000	NL Road
30	59130	2.768	0.204	0.000	0.000	0.000	0.000	NL Road
31	59140	2.213	0.200	0.000	0.000	0.000	0.000	NL Road
32	59150	4.329	0.801	0.000	0.000	0.000	0.000	NL Road
33	59160	0.349	1.511	0.000	0.000	0.000	0.000	NL Road
34	59170	1.147	0.082	0.000	0.000	0.000	0.000	NL Road
35	59180	2.010	0.000	0.000	0.000	0.000	0.000	NL Road
36	59190	0.018	8.925	0.000	0.000	0.000	0.000	BR
37	59200	0.539	3.823	0.000	0.000	0.000	0.000	NL Road
38	59210	1.934	0.047	0.000	0.000	0.000	0.000	NL Road
39	59220	4.044	0.000	0.000	0.000	0.000	0.000	NL Road
40	59230	0.051	1.207	0.000	0.000	0.000	0.000	NL Road
41	59240	0.238	0.795	0.000	0.000	0.000	0.000	NL Road
42	59250	0.064	1.339	0.000	0.000	0.000	0.000	NL Road
43	59260	1.545	0.069	0.000	0.000	0.000	0.000	NL Road
44	59270	3.733	0.109	0.000	0.000	0.000	0.000	NL Road
45	59280	1.417	1.014	0.000	0.000	0.000	0.000	NL Road
46	59290	4.210	1.278	0.000	0.000	0.000	0.000	NL Road
47	59300	1.196	2.638	0.000	0.000	0.000	0.000	NL Road
48	59310	1.838	0.152	0.000	0.000	0.000	0.000	NL Road
49	59320	3.023	0.008	0.000	0.000	0.000	0.000	NL Road
50	59330	4.460	0.000	0.000	0.000	0.000	0.000	NL Road

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
51	59340	3.932	0.000	0.000	0.000	0.000	0.000	NL Road
52	59350	3.017	1.617	0.000	0.000	0.000	0.000	NL Road
53	59360	6.920	0.000	0.000	0.000	0.000	0.000	NL Road
54	59370	1.569	3.214	0.000	0.000	0.000	0.000	NL Road
55	59380	0.777	1.054	0.000	0.000	0.000	0.000	NL Road
56	59390	2.237	0.801	0.000	0.000	0.000	0.000	NL Road
57	59400	2.522	0.030	0.000	0.000	0.000	0.000	NL Road
58	59410	5.937	0.152	0.000	0.000	0.000	0.000	NL Road
59	59420	2.328	0.592	0.000	0.000	0.000	0.000	NL Road
60	59430	5.357	0.581	0.000	0.000	0.000	0.000	NL Road
61	59440	12.685	2.745	0.000	0.000	0.000	0.000	NL Road
62	59450	13.955	0.337	0.000	0.000	0.000	0.000	NL Road
63	59460	15.439	0.174	0.000	0.000	0.000	0.000	NL Road
64	59470	18.523	0.000	0.000	0.000	0.000	0.000	NL Road
65	59480	16.728	0.116	0.000	0.000	0.000	0.000	NL Road
66	59490	12.865	0.763	0.000	0.000	0.000	0.000	NL Road
67	59500	11.597	0.026	0.000	0.000	0.000	0.000	NL Road
68	59510	5.411	3.186	0.000	0.000	0.000	0.000	NL Road
69	59520	3.884	9.008	0.000	0.000	0.000	0.000	NL Road
70	59530	3.418	12.541	0.000	0.000	0.000	0.000	NL Road
71	59540	7.753	14.601	0.000	0.000	0.000	0.000	NL Road
72	59550	25.070	1.344	0.000	0.000	0.000	0.000	NL Road
73	59560	7.735	8.478	0.000	0.000	0.000	0.000	NL Road
74	59570	0.515	17.829	0.000	0.000	0.000	0.000	NL Road
75	59580	0.000	23.525	0.000	0.000	0.000	0.000	NL Road
76	59590	0.000	28.441	0.000	0.000	0.000	0.000	NL Road
77	59600	0.000	25.873	0.000	0.000	0.000	0.000	NL Road
78	59610	0.000	31.442	0.000	0.000	0.000	0.000	NL Road
79	59620	0.000	27.253	0.000	0.000	0.000	0.000	NL Road
80	59630	0.000	25.789	0.000	0.000	0.000	0.000	NL Road
81	59640	3.866	15.879	0.000	0.000	0.000	0.000	NL Road
82	59650	2.395	12.603	0.000	0.000	0.000	0.000	NL Road
83	59660	0.471	15.553	0.000	0.000	0.000	0.000	NL Road
84	59670	0.897	18.428	0.000	0.000	0.000	0.000	NL Road
85	59680	0.564	17.420	0.000	0.000	0.000	0.000	NL Road
86	59690	0.534	12.773	0.000	0.000	0.000	0.000	NL Road
87	59700	1.005	14.946	0.000	0.000	0.000	0.000	NL Road
88	59710	1.453	9.654	0.000	0.000	0.000	0.000	NL Road
89	59720	2.415	6.541	0.000	0.000	0.000	0.000	NL Road
90	59730	1.736	3.586	0.000	0.000	0.000	0.000	NL Road
91	59740	0.000	2.988	0.000	0.000	0.000	0.000	NL Road
92	59750	0.062	2.788	0.000	0.000	0.000	0.000	NL Road
93	59760	0.317	2.103	0.000	0.000	0.000	0.000	NL Road
94	59770	1.868	0.145	0.000	0.000	0.000	0.000	NL Road
95	59780	1.851	0.036	0.000	0.000	0.000	0.000	NL Road
96	59790	3.140	0.015	0.000	0.000	0.000	0.000	NL Road
97	59800	0.000	6.464	0.000	0.000	0.000	0.000	NL Road
98	59810	0.000	1.943	0.000	0.000	0.000	0.000	NL Road
99	59820	0.070	0.944	0.000	0.000	0.000	0.000	NL Road
100	59830	0.049	1.240	0.000	0.000	0.000	0.000	NL Road
101	59840	0.037	7.314	0.000	0.000	0.000	0.000	NL Road
102	59850	0.000	9.023	0.000	0.000	0.000	0.000	NL Road
103	59860	4.315	0.757	0.000	0.000	0.000	0.000	NL Road
104	59870	5.225	6.658	0.000	0.000	0.000	0.000	NL Road
105	59880	16.311	0.586	0.000	0.000	0.000	0.000	NL Road
106	59890	24.504	0.075	0.000	0.000	0.000	0.000	NL Road

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
107	59900	25.580	3.592	0.000	0.000	0.000	0.000	NL Road
108	59910	21.870	3.470	0.000	0.000	0.000	0.000	NL Road
109	59920	8.230	14.681	0.000	0.000	0.000	0.000	NL Road
110	59930	4.539	17.506	0.000	0.000	0.000	0.000	NL Road
111	59940	0.000	33.060	0.000	0.000	0.000	0.000	NL Road
112	59950	0.000	49.901	0.000	0.000	0.000	0.000	NL Road
113	59960	0.000	62.682	0.000	0.000	0.000	0.000	NL Road
114	59970	0.000	77.090	0.000	0.000	0.000	0.000	BR
115	59980	0.000	87.174	0.000	0.000	0.000	0.000	BR
116	59990	0.000	106.563	0.000	0.000	0.000	0.000	BR
117	60000	0.000	122.730	0.000	0.000	0.000	0.000	BR
118	60010	0.000	114.632	0.000	1186.810	1134.310	52.500	BR
119	60020	0.000	106.498	0.000	1105.650	1053.150	52.500	New Alignment
120	60030	0.000	109.253	0.000	1078.755	1026.255	52.500	New Alignment
121	60040	0.000	95.853	0.000	1025.530	973.030	52.500	New Alignment
122	60050	0.000	68.010	0.000	819.315	766.815	52.500	New Alignment
123	60060	0.000	34.143	0.000	510.765	458.265	52.500	New Alignment
124	60070	3.331	8.355	16.655	212.490	159.990	52.500	New Alignment
125	60080	12.797	2.261	80.640	53.080	0.580	52.500	New Alignment
126	60090	33.301	0.825	230.490	15.430	0.000	15.430	New Alignment
127	60100	55.036	0.601	441.685	7.130	0.000	7.130	New Alignment
128	60110	72.008	0.067	635.220	3.340	0.000	3.340	New Alignment
129	60120	113.480	7.258	927.440	36.625	0.000	36.625	New Alignment
130	60130	190.151	5.577	1518.155	64.175	11.675	52.500	New Alignment
131	60140	100.952	0.000	1455.515	27.885	0.000	27.885	New Alignment
132	60150	76.980	0.069	889.660	0.345	0.000	0.345	New Alignment
133	60160	166.572	2.419	1217.760	12.440	0.000	12.440	New Alignment
134	60170	96.835	1.402	1317.035	19.105	0.000	19.105	New Alignment
135	60180	107.337	0.006	1020.860	7.040	0.000	7.040	New Alignment
136	60190	63.537	1.978	854.370	9.920	0.000	9.920	New Alignment
137	60200	53.606	0.726	585.715	13.520	0.000	13.520	New Alignment
138	60210	47.100	0.193	503.530	4.595	0.000	4.595	New Alignment
139	60220	48.115	0.002	476.075	0.975	0.000	0.975	New Alignment
140	60230	50.220	0.008	491.675	0.050	0.000	0.050	New Alignment
141	60240	41.457	0.275	458.385	1.415	0.000	1.415	New Alignment
142	60250	25.511	0.666	334.840	4.705	0.000	4.705	New Alignment
143	60260	40.369	0.012	329.400	3.390	0.000	3.390	New Alignment
144	60270	51.400	0.000	458.845	0.060	0.000	0.060	New Alignment
145	60280	45.822	0.023	486.110	0.115	0.000	0.115	New Alignment
146	60290	59.002	0.000	524.120	0.115	0.000	0.115	New Alignment
147	60300	72.665	0.000	658.335	0.000	0.000	0.000	New Alignment
148	60310	49.932	0.000	612.985	0.000	0.000	0.000	New Alignment
149	60320	7.556	9.690	287.440	48.450	0.000	48.450	New Alignment
150	60330	0.000	32.030	37.780	208.600	156.100	52.500	New Alignment
151	60340	5.115	11.167	25.575	215.985	163.485	52.500	New Alignment
152	60350	20.227	1.771	126.710	64.690	12.190	52.500	New Alignment
153	60360	31.014	1.194	256.205	14.825	0.000	14.825	New Alignment
154	60370	25.849	4.916	284.315	30.550	0.000	30.550	New Alignment
155	60380	26.853	3.469	263.510	41.925	0.000	41.925	New Alignment
156	60390	28.848	4.986	278.505	42.275	0.000	42.275	New Alignment
157	60400	25.865	3.389	273.565	41.875	0.000	41.875	New Alignment
158	60410	26.559	4.912	262.120	41.505	0.000	41.505	New Alignment
159	60420	18.643	4.846	226.010	48.790	0.000	48.790	New Alignment
160	60430	9.282	8.754	139.625	68.000	15.500	52.500	New Alignment
161	60440	4.654	17.483	69.680	131.185	78.685	52.500	New Alignment
162	60450	8.868	14.187	67.610	158.350	105.850	52.500	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
163	60460	10.649	8.119	97.585	111.530	59.030	52.500	New Alignment
164	60470	8.195	6.554	94.220	73.365	20.865	52.500	New Alignment
165	60480	8.874	9.168	85.345	78.610	26.110	52.500	New Alignment
166	60490	16.415	11.013	126.445	100.905	48.405	52.500	New Alignment
167	60500	22.409	9.326	194.120	101.695	49.195	52.500	New Alignment
168	60510	25.935	7.620	241.720	84.730	32.230	52.500	New Alignment
169	60520	32.312	14.204	291.235	109.120	56.620	52.500	New Alignment
170	60530	42.801	13.311	375.565	137.575	85.075	52.500	New Alignment
171	60540	43.710	17.552	432.555	154.315	101.815	52.500	New Alignment
172	60550	31.466	12.363	375.880	149.575	97.075	52.500	New Alignment
173	60560	38.404	10.320	349.350	113.415	60.915	52.500	New Alignment
174	60570	33.397	11.518	359.005	109.190	56.690	52.500	New Alignment
175	60580	3.038	32.830	182.175	221.740	169.240	52.500	New Alignment
176	60590	2.280	33.784	26.590	333.070	280.570	52.500	New Alignment
177	60600	2.270	34.733	22.750	342.585	290.085	52.500	New Alignment
178	60610	24.947	3.862	136.085	192.975	140.475	52.500	New Alignment
179	60620	26.232	1.136	255.895	24.990	0.000	24.990	New Alignment
180	60630	15.385	8.420	208.085	47.780	0.000	47.780	New Alignment
181	60640	13.850	19.713	146.175	140.665	88.165	52.500	New Alignment
182	60650	5.847	25.194	98.485	224.535	172.035	52.500	New Alignment
183	60660	8.242	24.544	70.445	248.690	196.190	52.500	New Alignment
184	60670	15.450	17.493	118.460	210.185	157.685	52.500	New Alignment
185	60680	23.392	18.263	194.210	178.780	126.280	52.500	New Alignment
186	60690	31.684	12.166	275.380	152.145	99.645	52.500	New Alignment
187	60700	34.900	7.607	332.920	98.865	46.365	52.500	New Alignment
188	60710	46.782	0.439	408.410	40.230	0.000	40.230	New Alignment
189	60720	64.494	0.000	556.380	2.195	0.000	2.195	New Alignment
190	60730	82.204	0.000	733.490	0.000	0.000	0.000	New Alignment
191	60740	89.200	0.000	857.020	0.000	0.000	0.000	New Alignment
192	60750	57.198	0.000	731.990	0.000	0.000	0.000	New Alignment
193	60760	16.304	0.916	367.510	4.580	0.000	4.580	New Alignment
194	60770	1.732	1.384	90.180	11.500	0.000	11.500	New Alignment
195	60780	45.977	0.000	238.545	6.920	0.000	6.920	New Alignment
196	60790	93.798	0.000	698.875	0.000	0.000	0.000	New Alignment
197	60800	161.599	0.000	1276.985	0.000	0.000	0.000	New Alignment
198	60810	198.382	0.000	1799.905	0.000	0.000	0.000	New Alignment
199	60820	175.676	0.000	1870.290	0.000	0.000	0.000	New Alignment
200	60830	89.535	0.000	1326.055	0.000	0.000	0.000	New Alignment
201	60840	40.953	6.103	652.440	30.515	0.000	30.515	New Alignment
202	60850	19.279	4.577	301.160	53.400	0.900	52.500	New Alignment
203	60860	7.408	5.395	133.435	49.860	0.000	49.860	New Alignment
204	60870	3.955	8.854	56.815	71.245	18.745	52.500	New Alignment
205	60880	2.470	12.590	32.125	107.220	54.720	52.500	New Alignment
206	60890	4.590	13.198	35.300	128.940	76.440	52.500	New Alignment
207	60900	5.421	7.965	50.055	105.815	53.315	52.500	New Alignment
208	60910	10.418	6.608	79.195	72.865	20.365	52.500	New Alignment
209	60920	15.999	7.994	132.085	73.010	20.510	52.500	New Alignment
210	60930	8.256	6.854	121.275	74.240	21.740	52.500	New Alignment
211	60940	16.448	6.860	123.520	68.570	16.070	52.500	New Alignment
212	60950	7.969	10.175	122.085	85.175	32.675	52.500	New Alignment
213	60960	10.284	9.681	91.265	99.280	46.780	52.500	New Alignment
214	60970	8.640	12.829	94.620	112.550	60.050	52.500	New Alignment
215	60980	10.779	12.778	97.095	128.035	75.535	52.500	New Alignment
216	60990	19.492	7.065	151.355	99.215	46.715	52.500	New Alignment
217	61000	22.426	3.115	209.590	50.900	0.000	50.900	New Alignment
218	61010	19.419	2.300	209.225	27.075	0.000	27.075	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
219	61020	59.606	0.000	395.125	11.500	0.000	11.500	New Alignment
220	61030	63.672	4.166	616.390	20.830	0.000	20.830	New Alignment
221	61040	56.876	2.947	602.740	35.565	0.000	35.565	New Alignment
222	61050	62.427	0.918	596.515	19.325	0.000	19.325	New Alignment
223	61060	73.706	0.546	680.665	7.320	0.000	7.320	New Alignment
224	61070	69.240	0.486	714.730	5.160	0.000	5.160	New Alignment
225	61080	89.269	0.028	792.545	2.570	0.000	2.570	New Alignment
226	61090	112.353	0.623	1008.110	3.255	0.000	3.255	New Alignment
227	61100	66.269	6.630	893.110	36.265	0.000	36.265	New Alignment
228	61110	11.077	23.208	386.730	149.190	96.690	52.500	New Alignment
229	61120	17.732	33.652	144.045	284.300	231.800	52.500	New Alignment
230	61130	58.462	17.887	380.970	257.695	205.195	52.500	New Alignment
231	61140	125.280	3.091	918.710	104.890	52.390	52.500	New Alignment
232	61150	141.053	6.801	1331.665	49.460	0.000	49.460	New Alignment
233	61160	159.337	7.383	1501.950	70.920	18.420	52.500	New Alignment
234	61170	170.775	5.185	1650.560	62.840	10.340	52.500	New Alignment
235	61180	156.459	3.638	1636.170	44.115	0.000	44.115	New Alignment
236	61190	103.102	6.987	1297.805	53.125	0.625	52.500	New Alignment
237	61200	45.345	33.359	742.235	201.730	149.230	52.500	New Alignment
238	61210	72.892	33.603	591.185	334.810	282.310	52.500	New Alignment
239	61220	151.653	10.262	1122.725	219.325	166.825	52.500	New Alignment
240	61230	118.139	13.989	1348.960	121.255	68.755	52.500	New Alignment
241	61240	74.265	13.094	962.020	135.415	82.915	52.500	New Alignment
242	61250	61.426	0.386	678.455	67.400	14.900	52.500	New Alignment
243	61260	46.940	2.113	541.830	12.495	0.000	12.495	New Alignment
244	61270	53.391	0.000	501.655	10.565	0.000	10.565	New Alignment
245	61280	105.551	0.000	794.710	0.000	0.000	0.000	New Alignment
246	61290	79.973	0.000	927.620	0.000	0.000	0.000	New Alignment
247	61300	48.101	0.011	640.370	0.055	0.000	0.055	New Alignment
248	61310	13.418	12.035	307.595	60.230	7.730	52.500	New Alignment
249	61320	18.605	7.248	160.115	96.415	43.915	52.500	New Alignment
250	61330	44.868	0.000	317.365	36.240	0.000	36.240	New Alignment
251	61340	71.580	0.000	582.240	0.000	0.000	0.000	New Alignment
252	61350	80.841	0.000	762.105	0.000	0.000	0.000	New Alignment
253	61360	70.849	0.000	758.450	0.000	0.000	0.000	New Alignment
254	61370	41.965	0.087	564.070	0.435	0.000	0.435	New Alignment
255	61380	71.443	0.000	567.040	0.435	0.000	0.435	New Alignment
256	61390	103.428	0.000	874.355	0.000	0.000	0.000	New Alignment
257	61400	40.830	10.356	721.290	51.780	0.000	51.780	New Alignment
258	61410	1.781	54.120	213.055	322.380	269.880	52.500	New Alignment
259	61420	2.936	36.822	23.585	454.710	402.210	52.500	New Alignment
260	61430	53.801	4.889	283.685	208.555	156.055	52.500	New Alignment
261	61440	91.133	0.022	724.670	24.555	0.000	24.555	New Alignment
262	61450	64.357	0.010	777.450	0.160	0.000	0.160	New Alignment
263	61460	43.813	0.507	540.850	2.585	0.000	2.585	New Alignment
264	61470	31.150	4.197	374.815	23.520	0.000	23.520	New Alignment
265	61480	16.884	10.622	240.170	74.095	21.595	52.500	New Alignment
266	61490	40.361	2.643	286.225	66.325	13.825	52.500	New Alignment
267	61500	60.461	1.265	504.110	19.540	0.000	19.540	New Alignment
268	61510	33.674	1.013	470.675	11.390	0.000	11.390	New Alignment
269	61520	19.845	2.837	267.595	19.250	0.000	19.250	New Alignment
270	61530	20.647	7.658	202.460	52.475	0.000	52.475	New Alignment
271	61540	58.862	0.000	397.545	38.290	0.000	38.290	New Alignment
272	61550	68.712	0.001	637.870	0.005	0.000	0.005	New Alignment
273	61560	18.532	9.530	436.220	47.655	0.000	47.655	New Alignment
274	61570	4.327	26.887	114.295	182.085	129.585	52.500	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
275	61580	1.206	41.309	27.665	340.980	288.480	52.500	New Alignment
276	61590	1.796	36.195	15.010	387.520	335.020	52.500	New Alignment
277	61600	13.995	20.998	78.955	285.965	233.465	52.500	New Alignment
278	61610	22.268	12.901	181.315	169.495	116.995	52.500	New Alignment
279	61620	24.287	10.616	232.775	117.585	65.085	52.500	New Alignment
280	61630	42.208	2.223	332.475	64.195	11.695	52.500	New Alignment
281	61640	57.291	0.000	497.495	11.115	0.000	11.115	New Alignment
282	61650	33.222	0.423	452.565	2.115	0.000	2.115	New Alignment
283	61660	1.092	4.907	171.570	26.650	0.000	26.650	New Alignment
284	61670	38.232	0.000	196.620	24.535	0.000	24.535	New Alignment
285	61680	130.769	0.000	845.005	0.000	0.000	0.000	New Alignment
286	61690	84.582	0.000	1076.755	0.000	0.000	0.000	New Alignment
287	61700	52.163	0.000	683.725	0.000	0.000	0.000	New Alignment
288	61710	66.436	0.000	592.995	0.000	0.000	0.000	New Alignment
289	61720	56.246	0.410	613.410	2.050	0.000	2.050	New Alignment
290	61730	12.137	5.426	341.915	29.180	0.000	29.180	New Alignment
291	61740	27.232	10.290	196.845	78.580	26.080	52.500	New Alignment
292	61750	124.509	0.000	758.705	51.450	0.000	51.450	New Alignment
293	61760	259.701	0.000	1921.050	0.000	0.000	0.000	New Alignment
294	61770	364.999	0.000	3123.500	0.000	0.000	0.000	New Alignment
295	61780	230.076	0.000	2975.375	0.000	0.000	0.000	New Alignment
296	61790	84.674	3.175	1573.750	15.875	0.000	15.875	New Alignment
297	61800	0.000	48.622	423.370	258.985	206.485	52.500	New Alignment
298	61810	38.302	0.000	191.510	243.110	190.610	52.500	New Alignment
299	61820	157.022	0.000	976.620	0.000	0.000	0.000	New Alignment
300	61830	236.434	0.000	1967.280	0.000	0.000	0.000	New Alignment
301	61840	216.690	0.000	2265.620	0.000	0.000	0.000	New Alignment
302	61850	88.565	0.025	1526.275	0.125	0.000	0.125	New Alignment
303	61860	3.775	53.418	461.700	267.215	214.715	52.500	New Alignment
304	61870	10.660	31.016	72.175	422.170	369.670	52.500	New Alignment
305	61880	59.832	0.734	352.460	158.750	106.250	52.500	New Alignment
306	61890	79.885	0.000	698.585	3.670	0.000	3.670	New Alignment
307	61900	90.050	0.000	849.675	0.000	0.000	0.000	New Alignment
308	61910	82.717	0.000	863.835	0.000	0.000	0.000	New Alignment
309	61920	71.982	0.000	773.495	0.000	0.000	0.000	New Alignment
310	61930	59.926	0.000	659.540	0.000	0.000	0.000	New Alignment
311	61940	63.882	0.000	619.040	0.000	0.000	0.000	New Alignment
312	61950	62.904	0.000	633.930	0.000	0.000	0.000	New Alignment
313	61960	69.426	0.000	661.650	0.000	0.000	0.000	New Alignment
314	61970	72.433	0.000	709.295	0.000	0.000	0.000	New Alignment
315	61980	80.478	0.000	764.555	0.000	0.000	0.000	New Alignment
316	61990	85.756	0.000	831.170	0.000	0.000	0.000	New Alignment
317	62000	83.268	0.000	845.120	0.000	0.000	0.000	New Alignment
318	62010	77.718	0.000	804.930	0.000	0.000	0.000	New Alignment
319	62020	58.838	0.000	682.780	0.000	0.000	0.000	New Alignment
320	62030	32.987	0.000	459.125	0.000	0.000	0.000	New Alignment
321	62040	52.185	0.000	425.860	0.000	0.000	0.000	New Alignment
322	62050	66.696	0.036	594.405	0.180	0.000	0.180	New Alignment
323	62060	94.162	0.000	804.290	0.180	0.000	0.180	New Alignment
324	62070	96.854	0.000	955.080	0.000	0.000	0.000	New Alignment
325	62080	84.343	0.000	905.985	0.000	0.000	0.000	New Alignment
326	62090	60.009	0.000	721.760	0.000	0.000	0.000	New Alignment
327	62100	48.561	0.000	542.850	0.000	0.000	0.000	New Alignment
328	62110	41.375	0.000	449.680	0.000	0.000	0.000	New Alignment
329	62120	40.233	0.000	408.040	0.000	0.000	0.000	New Alignment
330	62130	57.875	0.000	490.540	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
331	62140	78.999	0.000	684.370	0.000	0.000	0.000	New Alignment
332	62150	61.261	0.000	701.300	0.000	0.000	0.000	New Alignment
333	62160	29.721	0.002	454.910	0.010	0.000	0.010	New Alignment
334	62170	1.191	35.187	154.560	175.945	123.445	52.500	New Alignment
335	62180	0.000	60.481	5.955	478.340	425.840	52.500	New Alignment
336	62190	0.000	43.850	0.000	521.655	469.155	52.500	New Alignment
337	62200	0.000	24.347	0.000	340.985	288.485	52.500	New Alignment
338	62210	0.183	12.328	0.915	183.375	130.875	52.500	New Alignment
339	62220	7.854	8.361	40.185	103.445	50.945	52.500	New Alignment
340	62230	21.064	3.088	144.590	57.245	4.745	52.500	New Alignment
341	62240	45.768	0.003	334.160	15.455	0.000	15.455	New Alignment
342	62250	41.638	0.946	437.030	4.745	0.000	4.745	New Alignment
343	62260	34.113	5.931	378.755	34.385	0.000	34.385	New Alignment
344	62270	15.740	12.786	249.265	93.585	41.085	52.500	New Alignment
345	62280	2.967	24.195	93.535	184.905	132.405	52.500	New Alignment
346	62290	2.694	18.817	28.305	215.060	162.560	52.500	New Alignment
347	62300	23.680	2.189	131.870	105.030	52.530	52.500	New Alignment
348	62310	47.784	0.070	357.320	11.295	0.000	11.295	New Alignment
349	62320	47.982	0.240	478.830	1.550	0.000	1.550	New Alignment
350	62330	38.680	1.024	433.310	6.320	0.000	6.320	New Alignment
351	62340	7.625	14.426	231.525	77.250	24.750	52.500	New Alignment
352	62350	0.886	23.907	42.555	191.665	139.165	52.500	New Alignment
353	62360	23.242	1.082	120.640	124.945	72.445	52.500	New Alignment
354	62370	40.673	0.718	319.575	9.000	0.000	9.000	New Alignment
355	62380	50.348	0.014	455.105	3.660	0.000	3.660	New Alignment
356	62390	49.698	0.000	500.230	0.070	0.000	0.070	New Alignment
357	62400	50.899	0.000	502.985	0.000	0.000	0.000	New Alignment
358	62410	49.066	0.012	499.825	0.060	0.000	0.060	New Alignment
359	62420	31.341	0.139	402.035	0.755	0.000	0.755	New Alignment
360	62430	21.184	3.314	262.625	17.265	0.000	17.265	New Alignment
361	62440	5.635	8.211	134.095	57.625	5.125	52.500	New Alignment
362	62450	3.130	8.857	43.825	85.340	32.840	52.500	New Alignment
363	62460	7.528	0.004	53.290	44.305	0.000	44.305	New Alignment
364	62470	45.276	0.000	264.020	0.020	0.000	0.020	New Alignment
365	62480	119.305	0.000	822.905	0.000	0.000	0.000	New Alignment
366	62490	92.642	0.000	1059.735	0.000	0.000	0.000	New Alignment
367	62500	49.015	0.179	708.285	0.895	0.000	0.895	New Alignment
368	62510	27.139	2.955	380.770	15.670	0.000	15.670	New Alignment
369	62520	18.767	5.707	229.530	43.310	0.000	43.310	New Alignment
370	62530	24.487	6.665	216.270	61.860	9.360	52.500	New Alignment
371	62540	42.770	2.253	336.285	44.590	0.000	44.590	New Alignment
372	62550	58.071	0.000	504.205	11.265	0.000	11.265	New Alignment
373	62560	34.239	0.000	461.550	0.000	0.000	0.000	New Alignment
374	62570	26.417	0.697	303.280	3.485	0.000	3.485	New Alignment
375	62580	16.497	5.233	214.570	29.650	0.000	29.650	New Alignment
376	62590	16.710	7.451	166.035	63.420	10.920	52.500	New Alignment
377	62600	9.208	16.767	129.590	121.090	68.590	52.500	New Alignment
378	62610	24.082	5.829	166.450	112.980	60.480	52.500	New Alignment
379	62620	60.245	0.295	421.635	30.620	0.000	30.620	New Alignment
380	62630	66.179	0.000	632.120	1.475	0.000	1.475	New Alignment
381	62640	42.988	1.140	545.835	5.700	0.000	5.700	New Alignment
382	62650	47.674	4.905	453.310	30.225	0.000	30.225	New Alignment
383	62660	61.705	0.397	546.895	26.510	0.000	26.510	New Alignment
384	62670	71.054	0.003	663.795	2.000	0.000	2.000	New Alignment
385	62680	75.490	0.000	732.720	0.015	0.000	0.015	New Alignment
386	62690	70.767	0.000	731.285	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
387	62700	69.754	0.000	702.605	0.000	0.000	0.000	New Alignment
388	62710	58.562	0.000	641.580	0.000	0.000	0.000	New Alignment
389	62720	80.640	0.000	696.010	0.000	0.000	0.000	New Alignment
390	62730	154.983	0.000	1178.115	0.000	0.000	0.000	New Alignment
391	62740	201.949	0.000	1784.660	0.000	0.000	0.000	New Alignment
392	62750	200.926	0.000	2014.375	0.000	0.000	0.000	New Alignment
393	62760	55.563	0.000	1282.445	0.000	0.000	0.000	New Alignment
394	62770	33.347	0.000	444.550	0.000	0.000	0.000	New Alignment
395	62780	77.017	0.000	551.820	0.000	0.000	0.000	New Alignment
396	62790	28.404	0.000	527.105	0.000	0.000	0.000	New Alignment
397	62800	13.423	0.595	209.135	2.975	0.000	2.975	New Alignment
398	62810	80.277	0.000	468.500	2.975	0.000	2.975	New Alignment
399	62820	134.938	0.000	1076.075	0.000	0.000	0.000	New Alignment
400	62830	157.696	0.000	1463.170	0.000	0.000	0.000	New Alignment
401	62840	123.220	0.000	1404.580	0.000	0.000	0.000	New Alignment
402	62850	84.832	0.000	1040.260	0.000	0.000	0.000	New Alignment
403	62860	75.171	0.000	800.015	0.000	0.000	0.000	New Alignment
404	62870	92.253	0.000	837.120	0.000	0.000	0.000	New Alignment
405	62880	96.573	0.000	944.130	0.000	0.000	0.000	New Alignment
406	62890	92.001	0.000	942.870	0.000	0.000	0.000	New Alignment
407	62900	97.216	0.000	946.085	0.000	0.000	0.000	New Alignment
408	62910	92.462	0.000	948.390	0.000	0.000	0.000	New Alignment
409	62920	91.108	0.000	917.850	0.000	0.000	0.000	New Alignment
410	62930	95.549	0.000	933.285	0.000	0.000	0.000	New Alignment
411	62940	87.962	0.000	917.555	0.000	0.000	0.000	New Alignment
412	62950	66.130	0.000	770.460	0.000	0.000	0.000	New Alignment
413	62960	56.599	0.000	613.645	0.000	0.000	0.000	New Alignment
414	62970	64.995	0.000	607.970	0.000	0.000	0.000	New Alignment
415	62980	86.123	0.000	755.590	0.000	0.000	0.000	New Alignment
416	62990	66.573	0.000	763.480	0.000	0.000	0.000	New Alignment
417	63000	52.609	0.002	595.910	0.010	0.000	0.010	New Alignment
418	63010	43.804	0.020	482.065	0.110	0.000	0.110	New Alignment
419	63020	49.333	0.000	465.685	0.100	0.000	0.100	New Alignment
420	63030	61.895	0.000	556.140	0.000	0.000	0.000	New Alignment
421	63040	72.918	0.000	674.065	0.000	0.000	0.000	New Alignment
422	63050	62.237	0.000	675.775	0.000	0.000	0.000	New Alignment
423	63060	44.354	0.000	532.955	0.000	0.000	0.000	New Alignment
424	63070	46.628	0.000	454.910	0.000	0.000	0.000	New Alignment
425	63080	55.339	0.000	509.835	0.000	0.000	0.000	New Alignment
426	63090	65.916	0.000	606.275	0.000	0.000	0.000	New Alignment
427	63100	50.301	0.096	581.085	0.480	0.000	0.480	New Alignment
428	63110	57.931	0.821	541.160	4.585	0.000	4.585	New Alignment
429	63120	150.834	0.000	1043.825	4.105	0.000	4.105	New Alignment
430	63130	177.232	0.000	1640.330	0.000	0.000	0.000	New Alignment
431	63140	152.499	0.000	1648.655	0.000	0.000	0.000	New Alignment
432	63150	115.987	0.000	1342.430	0.000	0.000	0.000	New Alignment
433	63160	80.759	0.000	983.730	0.000	0.000	0.000	New Alignment
434	63170	51.144	0.000	659.515	0.000	0.000	0.000	New Alignment
435	63180	38.360	0.000	447.520	0.000	0.000	0.000	New Alignment
436	63190	54.952	0.000	466.560	0.000	0.000	0.000	New Alignment
437	63200	72.682	0.000	638.170	0.000	0.000	0.000	New Alignment
438	63210	37.276	0.000	549.790	0.000	0.000	0.000	New Alignment
439	63220	0.000	6.620	186.380	33.100	0.000	33.100	New Alignment
440	63230	7.895	0.000	39.475	33.100	0.000	33.100	New Alignment
441	63240	43.160	0.000	255.275	0.000	0.000	0.000	New Alignment
442	63250	47.766	0.000	454.630	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
443	63260	29.008	0.000	383.870	0.000	0.000	0.000	New Alignment
444	63270	6.890	0.010	179.490	0.050	0.000	0.050	New Alignment
445	63280	0.000	18.340	34.450	91.750	39.250	52.500	New Alignment
446	63290	0.000	45.792	0.000	320.660	268.160	52.500	New Alignment
447	63300	0.000	67.096	0.000	0.000	0.000	0.000	BR
448	63310	0.000	80.883	0.000	0.000	0.000	0.000	BR
449	63320	0.000	115.959	0.000	0.000	0.000	0.000	BR
450	63330	0.000	118.612	0.000	0.000	0.000	0.000	BR
451	63340	0.000	125.208	0.000	0.000	0.000	0.000	BR
452	63350	0.000	120.523	0.000	0.000	0.000	0.000	BR
453	63360	0.000	74.524	0.000	0.000	0.000	0.000	BR
454	63370	0.000	23.488	0.000	0.000	0.000	0.000	BR
455	63380	120.176	0.000	600.880	117.440	64.940	52.500	New Alignment
456	63390	305.958	0.000	2130.670	0.000	0.000	0.000	New Alignment
457	63400	445.900	0.000	3759.290	0.000	0.000	0.000	New Alignment
458	63410	589.313	0.000	5176.065	0.000	0.000	0.000	New Alignment
459	63420	716.024	0.000	6526.685	0.000	0.000	0.000	New Alignment
460	63430	630.264	0.000	6731.440	0.000	0.000	0.000	New Alignment
461	63440	432.084	0.000	5311.740	0.000	0.000	0.000	New Alignment
462	63450	303.363	0.000	3677.235	0.000	0.000	0.000	New Alignment
463	63460	204.406	0.000	2538.845	0.000	0.000	0.000	New Alignment
464	63470	110.960	0.000	1576.830	0.000	0.000	0.000	New Alignment
465	63480	81.886	0.738	964.230	3.690	0.000	3.690	New Alignment
466	63490	121.310	0.000	1015.980	3.690	0.000	3.690	New Alignment
467	63500	114.968	0.000	1181.390	0.000	0.000	0.000	New Alignment
468	63510	101.843	0.000	1084.055	0.000	0.000	0.000	New Alignment
469	63520	135.922	0.000	1188.825	0.000	0.000	0.000	New Alignment
470	63530	142.612	0.000	1392.670	0.000	0.000	0.000	New Alignment
471	63540	111.052	0.000	1268.320	0.000	0.000	0.000	New Alignment
472	63550	102.829	0.000	1069.405	0.000	0.000	0.000	New Alignment
473	63560	114.792	0.000	1088.105	0.000	0.000	0.000	New Alignment
474	63570	114.877	0.000	1148.345	0.000	0.000	0.000	New Alignment
475	63580	82.057	0.000	984.670	0.000	0.000	0.000	New Alignment
476	63590	53.158	0.000	676.075	0.000	0.000	0.000	New Alignment
477	63600	35.660	0.000	444.090	0.000	0.000	0.000	New Alignment
478	63610	30.093	0.000	328.765	0.000	0.000	0.000	New Alignment
479	63620	32.104	0.000	310.985	0.000	0.000	0.000	New Alignment
480	63630	64.053	0.000	480.785	0.000	0.000	0.000	New Alignment
481	63640	99.526	0.000	817.895	0.000	0.000	0.000	New Alignment
482	63650	128.742	0.000	1141.340	0.000	0.000	0.000	New Alignment
483	63660	126.316	0.000	1275.290	0.000	0.000	0.000	New Alignment
484	63670	80.729	0.000	1035.225	0.000	0.000	0.000	New Alignment
485	63680	36.365	4.533	585.470	22.665	0.000	22.665	New Alignment
486	63690	29.302	3.755	328.335	41.440	0.000	41.440	New Alignment
487	63700	34.117	1.233	317.095	24.940	0.000	24.940	New Alignment
488	63710	55.338	0.000	447.275	6.165	0.000	6.165	New Alignment
489	63720	71.691	0.000	635.145	0.000	0.000	0.000	New Alignment
490	63730	71.981	0.000	718.360	0.000	0.000	0.000	New Alignment
491	63740	64.757	0.000	683.690	0.000	0.000	0.000	New Alignment
492	63750	65.480	0.000	651.185	0.000	0.000	0.000	New Alignment
493	63760	58.868	0.022	621.740	0.110	0.000	0.110	New Alignment
494	63770	46.010	0.000	524.390	0.110	0.000	0.110	New Alignment
495	63780	41.745	0.000	438.775	0.000	0.000	0.000	New Alignment
496	63790	62.400	0.000	520.725	0.000	0.000	0.000	New Alignment
497	63800	92.331	0.000	773.655	0.000	0.000	0.000	New Alignment
498	63810	67.525	0.000	799.280	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
499	63820	52.998	0.079	602.615	0.395	0.000	0.395	New Alignment
500	63830	121.090	0.000	870.440	0.395	0.000	0.395	New Alignment
501	63840	145.328	0.000	1332.090	0.000	0.000	0.000	New Alignment
502	63850	126.235	0.000	1357.815	0.000	0.000	0.000	New Alignment
503	63860	108.240	0.000	1172.375	0.000	0.000	0.000	New Alignment
504	63870	77.438	0.000	928.390	0.000	0.000	0.000	New Alignment
505	63880	54.265	0.001	658.515	0.005	0.000	0.005	New Alignment
506	63890	56.366	0.000	553.155	0.005	0.000	0.005	New Alignment
507	63900	41.805	0.000	490.855	0.000	0.000	0.000	New Alignment
508	63910	42.782	0.000	422.935	0.000	0.000	0.000	New Alignment
509	63920	44.581	0.000	436.815	0.000	0.000	0.000	New Alignment
510	63930	50.674	0.000	476.275	0.000	0.000	0.000	New Alignment
511	63940	73.877	0.000	622.755	0.000	0.000	0.000	New Alignment
512	63950	186.139	0.000	1300.080	0.000	0.000	0.000	New Alignment
513	63960	350.159	0.000	2681.490	0.000	0.000	0.000	New Alignment
514	63970	359.454	0.000	3548.065	0.000	0.000	0.000	New Alignment
515	63980	153.633	0.000	2565.435	0.000	0.000	0.000	New Alignment
516	63990	95.784	0.000	1247.085	0.000	0.000	0.000	New Alignment
517	64000	61.369	0.000	785.765	0.000	0.000	0.000	New Alignment
518	64010	98.580	0.000	799.745	0.000	0.000	0.000	New Alignment
519	64020	121.505	0.000	1100.425	0.000	0.000	0.000	New Alignment
520	64030	125.845	0.000	1236.750	0.000	0.000	0.000	New Alignment
521	64040	125.052	0.000	1254.485	0.000	0.000	0.000	New Alignment
522	64050	122.224	0.000	1236.380	0.000	0.000	0.000	New Alignment
523	64060	132.118	0.000	1271.710	0.000	0.000	0.000	New Alignment
524	64070	137.244	0.000	1346.810	0.000	0.000	0.000	New Alignment
525	64080	123.655	0.000	1304.495	0.000	0.000	0.000	New Alignment
526	64090	101.242	0.000	1124.485	0.000	0.000	0.000	New Alignment
527	64100	76.695	0.000	889.685	0.000	0.000	0.000	New Alignment
528	64110	33.040	0.000	548.675	0.000	0.000	0.000	New Alignment
529	64120	7.943	3.187	204.915	15.935	0.000	15.935	New Alignment
530	64130	6.130	9.837	70.365	65.120	12.620	52.500	New Alignment
531	64140	12.190	5.753	91.600	77.950	25.450	52.500	New Alignment
532	64150	32.696	0.972	224.430	33.625	0.000	33.625	New Alignment
533	64160	35.110	4.063	339.030	25.175	0.000	25.175	New Alignment
534	64170	44.422	2.243	397.660	31.530	0.000	31.530	New Alignment
535	64180	66.515	0.000	554.685	11.215	0.000	11.215	New Alignment
536	64190	78.092	0.000	723.035	0.000	0.000	0.000	New Alignment
537	64200	80.998	0.000	795.450	0.000	0.000	0.000	New Alignment
538	64210	86.627	0.000	838.125	0.000	0.000	0.000	New Alignment
539	64220	81.733	0.000	841.800	0.000	0.000	0.000	New Alignment
540	64230	61.719	0.000	717.260	0.000	0.000	0.000	New Alignment
541	64240	70.282	0.000	660.005	0.000	0.000	0.000	New Alignment
542	64250	70.200	0.000	702.410	0.000	0.000	0.000	New Alignment
543	64260	41.032	0.000	556.160	0.000	0.000	0.000	New Alignment
544	64270	27.252	0.000	341.420	0.000	0.000	0.000	New Alignment
545	64280	40.696	0.000	339.740	0.000	0.000	0.000	New Alignment
546	64290	57.580	0.000	491.380	0.000	0.000	0.000	New Alignment
547	64300	53.735	0.000	556.575	0.000	0.000	0.000	New Alignment
548	64310	31.437	0.000	425.860	0.000	0.000	0.000	New Alignment
549	64320	0.000	6.863	157.185	34.315	0.000	34.315	New Alignment
550	64330	0.000	50.036	0.000	284.495	231.995	52.500	New Alignment
551	64340	0.000	61.066	0.000	555.510	503.010	52.500	New Alignment
552	64350	18.717	2.077	93.585	315.715	263.215	52.500	New Alignment
553	64360	37.244	0.000	279.805	10.385	0.000	10.385	New Alignment
554	64370	55.463	0.000	463.535	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
555	64380	72.466	0.000	639.645	0.000	0.000	0.000	New Alignment
556	64390	77.269	0.000	748.675	0.000	0.000	0.000	New Alignment
557	64400	80.183	0.000	787.260	0.000	0.000	0.000	New Alignment
558	64410	83.096	0.000	816.395	0.000	0.000	0.000	New Alignment
559	64420	73.008	0.000	780.520	0.000	0.000	0.000	New Alignment
560	64430	68.368	0.000	706.880	0.000	0.000	0.000	New Alignment
561	64440	65.919	0.000	671.435	0.000	0.000	0.000	New Alignment
562	64450	44.575	0.000	552.470	0.000	0.000	0.000	New Alignment
563	64460	45.808	0.000	451.915	0.000	0.000	0.000	New Alignment
564	64470	61.733	0.000	537.705	0.000	0.000	0.000	New Alignment
565	64480	55.368	0.000	585.505	0.000	0.000	0.000	New Alignment
566	64490	42.935	0.032	491.515	0.160	0.000	0.160	New Alignment
567	64500	35.377	0.021	391.560	0.265	0.000	0.265	New Alignment
568	64510	36.588	0.239	359.825	1.300	0.000	1.300	New Alignment
569	64520	25.495	0.417	310.415	3.280	0.000	3.280	New Alignment
570	64530	40.023	0.000	327.590	2.085	0.000	2.085	New Alignment
571	64540	36.890	0.418	384.565	2.090	0.000	2.090	New Alignment
572	64550	42.054	0.000	394.720	2.090	0.000	2.090	New Alignment
573	64560	51.623	0.000	468.385	0.000	0.000	0.000	New Alignment
574	64570	65.101	0.000	583.620	0.000	0.000	0.000	New Alignment
575	64580	99.269	0.000	821.850	0.000	0.000	0.000	New Alignment
576	64590	78.963	0.000	891.160	0.000	0.000	0.000	New Alignment
577	64600	64.061	0.000	715.120	0.000	0.000	0.000	New Alignment
578	64610	86.046	0.000	750.535	0.000	0.000	0.000	New Alignment
579	64620	71.317	0.000	786.815	0.000	0.000	0.000	New Alignment
580	64630	48.979	0.000	601.480	0.000	0.000	0.000	New Alignment
581	64640	49.735	0.000	493.570	0.000	0.000	0.000	New Alignment
582	64650	71.468	0.000	606.015	0.000	0.000	0.000	New Alignment
583	64660	84.081	0.000	777.745	0.000	0.000	0.000	New Alignment
584	64670	85.566	0.000	848.235	0.000	0.000	0.000	New Alignment
585	64680	96.808	0.000	911.870	0.000	0.000	0.000	New Alignment
586	64690	96.823	0.000	968.155	0.000	0.000	0.000	New Alignment
587	64700	94.106	0.000	954.645	0.000	0.000	0.000	New Alignment
588	64710	99.472	0.000	967.890	0.000	0.000	0.000	New Alignment
589	64720	142.253	0.000	1208.625	0.000	0.000	0.000	New Alignment
590	64730	139.740	0.000	1409.965	0.000	0.000	0.000	New Alignment
591	64740	127.547	0.000	1336.435	0.000	0.000	0.000	New Alignment
592	64750	117.600	0.000	1225.735	0.000	0.000	0.000	New Alignment
593	64760	112.135	0.000	1148.675	0.000	0.000	0.000	New Alignment
594	64770	130.228	0.000	1211.815	0.000	0.000	0.000	New Alignment
595	64780	156.841	0.000	1435.345	0.000	0.000	0.000	New Alignment
596	64790	189.744	0.000	1732.925	0.000	0.000	0.000	New Alignment
597	64800	159.464	0.000	1746.040	0.000	0.000	0.000	New Alignment
598	64810	146.993	0.000	1532.285	0.000	0.000	0.000	New Alignment
599	64820	163.459	0.000	1552.260	0.000	0.000	0.000	New Alignment
600	64830	143.692	0.000	1535.755	0.000	0.000	0.000	New Alignment
601	64840	185.731	0.000	1647.115	0.000	0.000	0.000	New Alignment
602	64850	187.221	0.000	1864.760	0.000	0.000	0.000	New Alignment
603	64860	130.892	0.000	1590.565	0.000	0.000	0.000	New Alignment
604	64870	117.369	0.000	1241.305	0.000	0.000	0.000	New Alignment
605	64880	90.986	0.000	1041.775	0.000	0.000	0.000	New Alignment
606	64890	82.378	0.000	866.820	0.000	0.000	0.000	New Alignment
607	64900	75.431	0.000	789.045	0.000	0.000	0.000	New Alignment
608	64910	85.845	0.000	806.380	0.000	0.000	0.000	New Alignment
609	64920	82.720	0.000	842.825	0.000	0.000	0.000	New Alignment
610	64930	74.141	0.000	784.305	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
611	64940	45.405	0.000	597.730	0.000	0.000	0.000	New Alignment
612	64950	25.387	0.010	353.960	0.050	0.000	0.050	New Alignment
613	64960	13.996	1.520	196.915	7.650	0.000	7.650	New Alignment
614	64970	12.867	4.435	134.315	29.775	0.000	29.775	New Alignment
615	64980	34.299	0.800	235.830	26.175	0.000	26.175	New Alignment
616	64990	51.599	0.247	429.490	5.235	0.000	5.235	New Alignment
617	65000	53.981	0.000	527.900	1.235	0.000	1.235	New Alignment
618	65010	57.531	0.000	557.560	0.000	0.000	0.000	New Alignment
619	65020	70.347	0.000	639.390	0.000	0.000	0.000	New Alignment
620	65030	69.551	0.000	699.490	0.000	0.000	0.000	New Alignment
621	65040	34.732	0.000	521.415	0.000	0.000	0.000	New Alignment
622	65050	5.310	2.403	200.210	12.015	0.000	12.015	New Alignment
623	65060	13.169	0.696	92.395	15.495	0.000	15.495	New Alignment
624	65070	39.089	0.000	261.290	3.480	0.000	3.480	New Alignment
625	65080	66.583	0.000	528.360	0.000	0.000	0.000	New Alignment
626	65090	83.515	0.000	750.490	0.000	0.000	0.000	New Alignment
627	65100	94.542	0.000	890.285	0.000	0.000	0.000	New Alignment
628	65110	79.990	0.000	872.660	0.000	0.000	0.000	New Alignment
629	65120	31.398	0.030	556.940	0.150	0.000	0.150	New Alignment
630	65130	48.404	0.000	399.010	0.150	0.000	0.150	New Alignment
631	65140	63.057	0.000	557.305	0.000	0.000	0.000	New Alignment
632	65150	74.843	0.000	689.500	0.000	0.000	0.000	New Alignment
633	65160	70.723	0.000	727.830	0.000	0.000	0.000	New Alignment
634	65170	66.475	0.000	685.990	0.000	0.000	0.000	New Alignment
635	65180	58.910	0.000	626.925	0.000	0.000	0.000	New Alignment
636	65190	47.151	0.000	530.305	0.000	0.000	0.000	New Alignment
637	65200	46.007	0.000	465.790	0.000	0.000	0.000	New Alignment
638	65210	33.425	0.196	397.160	0.980	0.000	0.980	New Alignment
639	65220	25.819	1.448	296.220	8.220	0.000	8.220	New Alignment
640	65230	37.498	2.433	316.585	19.405	0.000	19.405	New Alignment
641	65240	30.429	3.795	339.635	31.140	0.000	31.140	New Alignment
642	65250	28.452	9.380	294.405	65.875	13.375	52.500	New Alignment
643	65260	85.280	0.116	568.660	47.480	0.000	47.480	New Alignment
644	65270	169.335	0.000	1273.075	0.580	0.000	0.580	New Alignment
645	65280	146.296	0.000	1578.155	0.000	0.000	0.000	New Alignment
646	65290	95.545	0.000	1209.205	0.000	0.000	0.000	New Alignment
647	65300	76.466	0.000	860.055	0.000	0.000	0.000	New Alignment
648	65310	73.418	0.000	749.420	0.000	0.000	0.000	New Alignment
649	65320	71.231	0.000	723.245	0.000	0.000	0.000	New Alignment
650	65330	59.907	0.092	655.690	0.460	0.000	0.460	New Alignment
651	65340	49.748	4.490	548.275	22.910	0.000	22.910	New Alignment
652	65350	61.302	0.024	555.250	22.570	0.000	22.570	New Alignment
653	65360	74.769	0.000	680.355	0.120	0.000	0.120	New Alignment
654	65370	88.911	0.000	818.400	0.000	0.000	0.000	New Alignment
655	65380	81.484	0.000	851.975	0.000	0.000	0.000	New Alignment
656	65390	64.067	0.000	727.755	0.000	0.000	0.000	New Alignment
657	65400	56.025	0.000	600.460	0.000	0.000	0.000	New Alignment
658	65410	42.627	0.000	493.260	0.000	0.000	0.000	New Alignment
659	65420	65.972	0.000	542.995	0.000	0.000	0.000	New Alignment
660	65430	118.554	0.000	922.630	0.000	0.000	0.000	New Alignment
661	65440	152.863	0.000	1357.085	0.000	0.000	0.000	New Alignment
662	65450	228.318	0.000	1905.905	0.000	0.000	0.000	New Alignment
663	65460	194.302	0.000	2113.100	0.000	0.000	0.000	New Alignment
664	65470	156.283	0.000	1752.925	0.000	0.000	0.000	New Alignment
665	65480	105.708	0.000	1309.955	0.000	0.000	0.000	New Alignment
666	65490	72.396	0.000	890.520	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
667	65500	51.931	0.000	621.635	0.000	0.000	0.000	New Alignment
668	65510	59.126	0.000	555.285	0.000	0.000	0.000	New Alignment
669	65520	68.748	0.000	639.370	0.000	0.000	0.000	New Alignment
670	65530	67.586	0.000	681.670	0.000	0.000	0.000	New Alignment
671	65540	68.104	0.000	678.450	0.000	0.000	0.000	New Alignment
672	65550	77.157	0.000	726.305	0.000	0.000	0.000	New Alignment
673	65560	95.033	0.000	860.950	0.000	0.000	0.000	New Alignment
674	65570	119.027	0.000	1070.300	0.000	0.000	0.000	New Alignment
675	65580	107.199	0.000	1131.130	0.000	0.000	0.000	New Alignment
676	65590	79.172	0.000	931.855	0.000	0.000	0.000	New Alignment
677	65600	50.024	0.000	645.980	0.000	0.000	0.000	New Alignment
678	65610	46.135	0.000	480.795	0.000	0.000	0.000	New Alignment
679	65620	49.778	0.001	479.565	0.005	0.000	0.005	New Alignment
680	65630	63.845	0.000	568.115	0.005	0.000	0.005	New Alignment
681	65640	63.890	0.000	638.675	0.000	0.000	0.000	New Alignment
682	65650	56.142	0.000	600.160	0.000	0.000	0.000	New Alignment
683	65660	63.122	0.000	596.320	0.000	0.000	0.000	New Alignment
684	65670	69.373	0.000	662.475	0.000	0.000	0.000	New Alignment
685	65680	46.385	1.468	578.790	7.340	0.000	7.340	New Alignment
686	65690	57.480	0.022	519.325	7.450	0.000	7.450	New Alignment
687	65700	93.237	0.000	753.585	0.110	0.000	0.110	New Alignment
688	65710	86.071	0.000	896.540	0.000	0.000	0.000	New Alignment
689	65720	45.478	0.000	657.745	0.000	0.000	0.000	New Alignment
690	65730	17.909	3.272	316.935	16.360	0.000	16.360	New Alignment
691	65740	27.256	2.992	225.825	31.320	0.000	31.320	New Alignment
692	65750	45.768	6.546	365.120	47.690	0.000	47.690	New Alignment
693	65760	88.860	0.000	673.140	32.730	0.000	32.730	New Alignment
694	65770	89.421	0.000	891.405	0.000	0.000	0.000	New Alignment
695	65780	157.271	0.000	1233.460	0.000	0.000	0.000	New Alignment
696	65790	117.816	0.000	1375.435	0.000	0.000	0.000	New Alignment
697	65800	125.032	0.000	1214.240	0.000	0.000	0.000	New Alignment
698	65810	117.417	0.000	1212.245	0.000	0.000	0.000	New Alignment
699	65820	111.541	0.000	1144.790	0.000	0.000	0.000	New Alignment
700	65830	117.651	0.000	1145.960	0.000	0.000	0.000	New Alignment
701	65840	101.844	0.000	1097.475	0.000	0.000	0.000	New Alignment
702	65850	95.568	0.000	987.060	0.000	0.000	0.000	New Alignment
703	65860	86.255	0.000	909.115	0.000	0.000	0.000	New Alignment
704	65870	99.503	0.000	928.790	0.000	0.000	0.000	New Alignment
705	65880	124.847	0.000	1121.750	0.000	0.000	0.000	New Alignment
706	65890	144.567	0.000	1347.070	0.000	0.000	0.000	New Alignment
707	65900	153.014	0.000	1487.905	0.000	0.000	0.000	New Alignment
708	65910	156.817	0.000	1549.155	0.000	0.000	0.000	New Alignment
709	65920	157.032	0.000	1569.245	0.000	0.000	0.000	New Alignment
710	65930	158.360	0.000	1576.960	0.000	0.000	0.000	New Alignment
711	65940	170.445	0.000	1644.025	0.000	0.000	0.000	New Alignment
712	65950	174.390	0.000	1724.175	0.000	0.000	0.000	New Alignment
713	65960	166.637	0.000	1705.135	0.000	0.000	0.000	New Alignment
714	65970	154.733	0.000	1606.850	0.000	0.000	0.000	New Alignment
715	65980	127.922	0.000	1413.275	0.000	0.000	0.000	New Alignment
716	65990	84.115	0.000	1060.185	0.000	0.000	0.000	New Alignment
717	66000	39.116	0.000	616.155	0.000	0.000	0.000	New Alignment
718	66010	412.366	0.000	2257.410	0.000	0.000	0.000	New Alignment
719	66020	515.217	0.000	4637.915	0.000	0.000	0.000	New Alignment
720	66030	377.425	0.000	4463.210	0.000	0.000	0.000	New Alignment
721	66040	272.362	0.000	3248.935	0.000	0.000	0.000	New Alignment
722	66050	261.486	0.000	2669.240	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
723	66060	213.446	0.000	2374.660	0.000	0.000	0.000	New Alignment
724	66070	158.225	0.000	1858.355	0.000	0.000	0.000	New Alignment
725	66080	136.188	0.004	1472.065	0.020	0.000	0.020	New Alignment
726	66090	158.793	0.000	1474.905	0.020	0.000	0.020	New Alignment
727	66100	178.560	15.752	1686.765	78.760	26.260	52.500	New Alignment
728	66110	223.590	0.000	2010.750	78.760	26.260	52.500	New Alignment
729	66120	186.239	0.000	2049.145	0.000	0.000	0.000	New Alignment
730	66130	137.763	3.933	1620.010	19.665	0.000	19.665	New Alignment
731	66140	111.154	2.150	1244.585	30.415	0.000	30.415	New Alignment
732	66150	84.634	6.268	978.940	42.090	0.000	42.090	New Alignment
733	66160	69.807	4.666	772.205	54.670	2.170	52.500	New Alignment
734	66170	44.864	26.513	573.355	155.895	103.395	52.500	New Alignment
735	66180	12.552	27.812	287.080	271.625	219.125	52.500	New Alignment
736	66190	5.885	33.110	92.185	304.610	252.110	52.500	New Alignment
737	66200	32.872	37.805	193.785	354.575	302.075	52.500	New Alignment
738	66210	135.024	59.124	839.480	484.645	432.145	52.500	New Alignment
739	66220	217.154	82.765	1760.890	709.445	656.945	52.500	New Alignment
740	66230	219.404	50.942	2182.790	668.535	616.035	52.500	New Alignment
741	66240	182.356	27.501	2008.800	392.215	339.715	52.500	New Alignment
742	66250	147.526	51.985	1649.410	397.430	344.930	52.500	New Alignment
743	66260	158.566	56.052	1530.460	540.185	487.685	52.500	New Alignment
744	66270	231.038	29.627	1948.020	428.395	375.895	52.500	New Alignment
745	66280	155.609	19.875	1933.235	247.510	195.010	52.500	New Alignment
746	66290	51.704	31.273	1036.565	255.740	203.240	52.500	New Alignment
747	66300	13.609	46.133	326.565	387.030	334.530	52.500	New Alignment
748	66310	2.354	49.393	79.815	477.630	425.130	52.500	New Alignment
749	66320	2.400	52.865	23.770	511.290	458.790	52.500	New Alignment
750	66330	3.341	41.726	28.705	472.955	420.455	52.500	New Alignment
751	66340	24.617	8.380	139.790	250.530	198.030	52.500	New Alignment
752	66350	73.416	2.905	490.165	56.425	3.925	52.500	New Alignment
753	66360	17.119	18.465	452.675	106.850	54.350	52.500	New Alignment
754	66370	0.000	92.677	85.595	555.710	503.210	52.500	New Alignment
755	66380	0.000	189.414	0.000	1410.455	1357.955	52.500	New Alignment
756	66390	0.000	232.999	0.000	2112.065	2059.565	52.500	New Alignment
757	66400	0.000	151.139	0.000	1920.690	1868.190	52.500	New Alignment
758	66410	0.000	106.909	0.000	1290.240	1237.740	52.500	New Alignment
759	66420	2.712	43.418	13.560	751.635	699.135	52.500	New Alignment
760	66430	10.976	29.977	68.440	366.975	314.475	52.500	New Alignment
761	66440	24.701	29.120	178.385	295.485	242.985	52.500	New Alignment
762	66450	28.339	25.720	265.200	274.200	221.700	52.500	New Alignment
763	66460	56.347	12.410	423.430	190.650	138.150	52.500	New Alignment
764	66470	175.200	0.000	1157.735	62.050	9.550	52.500	New Alignment
765	66480	272.057	44.983	2236.285	224.915	172.415	52.500	New Alignment
766	66490	337.832	229.005	3049.445	1369.940	1317.440	52.500	New Alignment
767	66500	177.539	77.365	2576.855	1531.850	1479.350	52.500	New Alignment
768	66510	70.817	4.771	1241.780	410.680	358.180	52.500	New Alignment
769	66520	3.037	16.494	369.270	106.325	53.825	52.500	New Alignment
770	66530	1.775	40.705	24.060	285.995	233.495	52.500	New Alignment
771	66540	2.645	41.450	22.100	410.775	358.275	52.500	New Alignment
772	66550	2.600	39.278	26.225	403.640	351.140	52.500	New Alignment
773	66560	2.843	38.666	27.215	389.720	337.220	52.500	New Alignment
774	66570	3.237	40.590	30.400	396.280	343.780	52.500	New Alignment
775	66580	0.993	50.018	21.150	453.040	400.540	52.500	New Alignment
776	66590	0.276	26.265	6.345	381.415	328.915	52.500	New Alignment
777	66600	17.114	4.991	86.950	156.280	103.780	52.500	New Alignment
778	66610	37.872	0.592	274.930	27.915	0.000	27.915	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
779	66620	40.805	1.505	393.385	10.485	0.000	10.485	New Alignment
780	66630	15.880	9.506	283.425	55.055	2.555	52.500	New Alignment
781	66640	0.000	42.372	79.400	0.000	0.000	0.000	BR
782	66650	0.000	110.096	0.000	0.000	0.000	0.000	BR
783	66660	0.000	187.609	0.000	0.000	0.000	0.000	BR
784	66670	0.000	258.215	0.000	0.000	0.000	0.000	BR
785	66680	0.000	303.523	0.000	0.000	0.000	0.000	BR
786	66690	0.000	351.324	0.000	0.000	0.000	0.000	BR
787	66700	0.000	398.940	0.000	0.000	0.000	0.000	BR
788	66710	0.000	436.945	0.000	0.000	0.000	0.000	BR
789	66720	0.000	333.874	0.000	0.000	0.000	0.000	BR
790	66730	0.000	213.797	0.000	0.000	0.000	0.000	BR
791	66740	0.000	118.463	0.000	0.000	0.000	0.000	BR
792	66750	0.000	73.433	0.000	0.000	0.000	0.000	BR
793	66760	0.956	24.585	4.780	490.090	437.590	52.500	New Alignment
794	66770	8.280	12.144	46.180	183.645	131.145	52.500	New Alignment
795	66780	9.968	10.806	91.240	114.750	62.250	52.500	New Alignment
796	66790	5.589	15.067	77.785	129.365	76.865	52.500	New Alignment
797	66800	10.120	8.434	78.545	117.505	65.005	52.500	New Alignment
798	66810	38.519	0.038	243.195	42.360	0.000	42.360	New Alignment
799	66820	79.512	0.000	590.155	0.190	0.000	0.190	New Alignment
800	66830	126.245	0.000	1028.785	0.000	0.000	0.000	New Alignment
801	66840	175.977	0.000	1511.110	0.000	0.000	0.000	New Alignment
802	66850	219.255	0.000	1976.160	0.000	0.000	0.000	New Alignment
803	66860	250.093	0.000	2346.740	0.000	0.000	0.000	New Alignment
804	66870	281.534	0.000	2658.135	0.000	0.000	0.000	New Alignment
805	66880	332.131	0.000	3068.325	0.000	0.000	0.000	New Alignment
806	66890	225.615	0.000	2788.730	0.000	0.000	0.000	New Alignment
807	66900	232.350	0.000	2289.825	0.000	0.000	0.000	New Alignment
808	66910	251.108	0.000	2417.290	0.000	0.000	0.000	New Alignment
809	66920	252.724	0.000	2519.160	0.000	0.000	0.000	New Alignment
810	66930	169.251	0.000	2109.875	0.000	0.000	0.000	New Alignment
811	66940	218.273	0.000	1937.620	0.000	0.000	0.000	New Alignment
812	66950	537.561	0.000	3779.170	0.000	0.000	0.000	New Alignment
813	66960	448.393	0.000	4929.770	0.000	0.000	0.000	New Alignment
814	66970	383.653	0.000	4160.230	0.000	0.000	0.000	New Alignment
815	66980	336.738	0.000	3601.955	0.000	0.000	0.000	New Alignment
816	66990	291.710	0.000	3142.240	0.000	0.000	0.000	New Alignment
817	67000	259.550	0.000	2756.300	0.000	0.000	0.000	New Alignment
818	67010	266.052	0.000	2628.010	0.000	0.000	0.000	New Alignment
819	67020	284.584	0.000	2753.180	0.000	0.000	0.000	New Alignment
820	67030	309.314	1.918	2969.490	9.590	0.000	9.590	New Alignment
821	67040	221.597	1.885	2654.555	19.015	0.000	19.015	New Alignment
822	67050	185.037	0.000	2033.170	9.425	0.000	9.425	New Alignment
823	67060	182.851	0.000	1839.440	0.000	0.000	0.000	New Alignment
824	67070	159.198	0.000	1710.245	0.000	0.000	0.000	New Alignment
825	67080	148.895	0.000	1540.465	0.000	0.000	0.000	New Alignment
826	67090	176.269	0.000	1625.820	0.000	0.000	0.000	New Alignment
827	67100	204.353	0.000	1903.110	0.000	0.000	0.000	New Alignment
828	67110	207.008	0.000	2056.805	0.000	0.000	0.000	New Alignment
829	67120	118.666	0.000	1628.370	0.000	0.000	0.000	New Alignment
830	67130	234.307	0.000	1764.865	0.000	0.000	0.000	New Alignment
831	67140	419.420	0.000	3268.635	0.000	0.000	0.000	New Alignment
832	67150	438.516	0.000	4289.680	0.000	0.000	0.000	New Alignment
833	67160	401.460	0.000	4199.880	0.000	0.000	0.000	New Alignment
834	67170	337.566	0.000	3695.130	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
835	67180	387.493	0.000	3625.295	0.000	0.000	0.000	New Alignment
836	67190	401.546	0.000	3945.195	0.000	0.000	0.000	New Alignment
837	67200	380.973	0.000	3912.595	0.000	0.000	0.000	New Alignment
838	67210	312.179	0.000	3465.760	0.000	0.000	0.000	New Alignment
839	67220	275.142	0.000	2936.605	0.000	0.000	0.000	New Alignment
840	67230	265.287	0.000	2702.145	0.000	0.000	0.000	New Alignment
841	67240	242.236	0.000	2537.615	0.000	0.000	0.000	New Alignment
842	67250	182.981	0.000	2126.085	0.000	0.000	0.000	New Alignment
843	67260	124.031	0.000	1535.060	0.000	0.000	0.000	New Alignment
844	67270	196.405	0.000	1602.180	0.000	0.000	0.000	New Alignment
845	67280	295.079	0.000	2457.420	0.000	0.000	0.000	New Alignment
846	67290	288.541	0.000	2918.100	0.000	0.000	0.000	New Alignment
847	67300	373.010	0.000	3307.755	0.000	0.000	0.000	New Alignment
848	67310	404.499	0.000	3887.545	0.000	0.000	0.000	New Alignment
849	67320	377.873	0.000	3911.860	0.000	0.000	0.000	New Alignment
850	67330	466.003	0.000	4219.380	0.000	0.000	0.000	New Alignment
851	67340	368.351	11.688	4171.770	58.440	5.940	52.500	New Alignment
852	67350	248.118	169.368	3082.345	905.280	852.780	52.500	New Alignment
853	67360	37.277	34.937	1426.975	1021.525	969.025	52.500	New Alignment
854	67370	88.348	0.002	628.125	174.695	122.195	52.500	New Alignment
855	67380	56.900	2.850	726.240	14.260	0.000	14.260	New Alignment
856	67390	52.289	3.325	545.945	30.875	0.000	30.875	New Alignment
857	67400	264.767	0.019	1585.280	16.720	0.000	16.720	New Alignment
858	67410	281.632	0.000	2731.995	0.095	0.000	0.095	New Alignment
859	67420	308.747	0.000	2951.895	0.000	0.000	0.000	New Alignment
860	67430	334.228	0.000	3214.875	0.000	0.000	0.000	New Alignment
861	67440	309.865	0.000	3220.465	0.000	0.000	0.000	New Alignment
862	67450	291.354	0.000	3006.095	0.000	0.000	0.000	New Alignment
863	67460	289.316	0.000	2903.350	0.000	0.000	0.000	New Alignment
864	67470	260.478	0.000	2748.970	0.000	0.000	0.000	New Alignment
865	67480	273.606	0.000	2670.420	0.000	0.000	0.000	New Alignment
866	67490	344.953	0.000	3092.795	0.000	0.000	0.000	New Alignment
867	67500	367.845	0.000	3563.990	0.000	0.000	0.000	New Alignment
868	67510	385.298	0.000	3765.715	0.000	0.000	0.000	New Alignment
869	67520	351.765	0.000	3685.315	0.000	0.000	0.000	New Alignment
870	67530	289.721	0.000	3207.430	0.000	0.000	0.000	New Alignment
871	67540	258.439	0.000	2740.800	0.000	0.000	0.000	New Alignment
872	67550	253.773	0.000	2561.060	0.000	0.000	0.000	New Alignment
873	67560	236.952	0.000	2453.625	0.000	0.000	0.000	New Alignment
874	67570	226.048	0.000	2315.000	0.000	0.000	0.000	New Alignment
875	67580	232.788	0.000	2294.180	0.000	0.000	0.000	New Alignment
876	67590	218.750	0.000	2257.690	0.000	0.000	0.000	New Alignment
877	67600	219.486	0.000	2191.180	0.000	0.000	0.000	New Alignment
878	67610	207.308	0.000	2133.970	0.000	0.000	0.000	New Alignment
879	67620	162.879	0.000	1850.935	0.000	0.000	0.000	New Alignment
880	67630	155.528	0.000	1592.035	0.000	0.000	0.000	New Alignment
881	67640	155.497	0.000	1555.125	0.000	0.000	0.000	New Alignment
882	67650	165.558	0.000	1605.275	0.000	0.000	0.000	New Alignment
883	67660	138.437	0.027	1519.975	0.135	0.000	0.135	New Alignment
884	67670	168.561	0.000	1534.990	0.135	0.000	0.135	New Alignment
885	67680	250.302	0.000	2094.315	0.000	0.000	0.000	New Alignment
886	67690	284.774	0.000	2675.380	0.000	0.000	0.000	New Alignment
887	67700	304.379	0.000	2945.765	0.000	0.000	0.000	New Alignment
888	67710	279.411	0.000	2918.950	0.000	0.000	0.000	New Alignment
889	67720	253.703	0.000	2665.570	0.000	0.000	0.000	New Alignment
890	67730	270.972	0.000	2623.375	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
891	67740	337.180	0.000	3040.760	0.000	0.000	0.000	New Alignment
892	67750	384.668	0.000	3609.240	0.000	0.000	0.000	New Alignment
893	67760	321.515	0.000	3530.915	0.000	0.000	0.000	New Alignment
894	67770	259.189	0.000	2903.520	0.000	0.000	0.000	New Alignment
895	67780	235.017	0.000	2471.030	0.000	0.000	0.000	New Alignment
896	67790	225.927	0.000	2304.720	0.000	0.000	0.000	New Alignment
897	67800	288.065	0.000	2569.960	0.000	0.000	0.000	New Alignment
898	67810	334.954	0.000	3115.095	0.000	0.000	0.000	New Alignment
899	67820	360.805	0.000	3478.795	0.000	0.000	0.000	New Alignment
900	67830	358.369	0.000	3595.870	0.000	0.000	0.000	New Alignment
901	67840	329.314	0.000	3438.415	0.000	0.000	0.000	New Alignment
902	67850	202.469	0.000	2658.915	0.000	0.000	0.000	New Alignment
903	67860	307.279	0.000	2548.740	0.000	0.000	0.000	New Alignment
904	67870	283.049	0.000	2951.640	0.000	0.000	0.000	New Alignment
905	67880	364.948	0.000	3239.985	0.000	0.000	0.000	New Alignment
906	67890	408.906	0.000	3869.270	0.000	0.000	0.000	New Alignment
907	67900	428.339	0.000	4186.225	0.000	0.000	0.000	New Alignment
908	67910	390.734	0.000	4095.365	0.000	0.000	0.000	New Alignment
909	67920	398.354	0.000	3945.440	0.000	0.000	0.000	New Alignment
910	67930	421.034	0.000	4096.940	0.000	0.000	0.000	New Alignment
911	67940	433.638	0.000	4273.360	0.000	0.000	0.000	New Alignment
912	67950	467.305	0.000	4504.715	0.000	0.000	0.000	New Alignment
913	67960	550.078	0.000	5086.915	0.000	0.000	0.000	New Alignment
914	67970	512.527	0.000	5313.025	0.000	0.000	0.000	New Alignment
915	67980	406.018	0.000	4592.725	0.000	0.000	0.000	New Alignment
916	67990	342.070	0.000	3740.440	0.000	0.000	0.000	New Alignment
917	68000	346.195	0.000	3441.325	0.000	0.000	0.000	New Alignment
918	68010	428.653	0.000	3874.240	0.000	0.000	0.000	New Alignment
919	68020	482.223	0.000	4554.380	0.000	0.000	0.000	New Alignment
920	68030	488.139	0.000	4851.810	0.000	0.000	0.000	New Alignment
921	68040	456.011	0.000	4720.750	0.000	0.000	0.000	New Alignment
922	68050	466.749	0.000	4613.800	0.000	0.000	0.000	New Alignment
923	68060	469.073	0.000	4679.110	0.000	0.000	0.000	New Alignment
924	68070	493.709	0.000	4813.910	0.000	0.000	0.000	New Alignment
925	68080	505.717	0.000	4997.130	0.000	0.000	0.000	New Alignment
926	68090	484.383	0.000	4950.500	0.000	0.000	0.000	New Alignment
927	68100	410.720	0.000	4475.515	0.000	0.000	0.000	New Alignment
928	68110	336.211	0.000	3734.655	0.000	0.000	0.000	New Alignment
929	68120	296.966	0.000	3165.885	0.000	0.000	0.000	New Alignment
930	68130	318.159	0.000	3075.625	0.000	0.000	0.000	New Alignment
931	68140	311.621	0.000	3148.900	0.000	0.000	0.000	New Alignment
932	68150	275.117	0.000	2933.690	0.000	0.000	0.000	New Alignment
933	68160	276.272	0.000	2756.945	0.000	0.000	0.000	New Alignment
934	68170	336.393	0.000	3063.325	0.000	0.000	0.000	New Alignment
935	68180	444.455	0.000	3904.240	0.000	0.000	0.000	New Alignment
936	68190	514.640	0.000	4795.475	0.000	0.000	0.000	New Alignment
937	68200	525.891	0.000	5202.655	0.000	0.000	0.000	New Alignment
938	68210	461.348	0.000	4936.195	0.000	0.000	0.000	New Alignment
939	68220	402.903	0.000	4321.255	0.000	0.000	0.000	New Alignment
940	68230	321.755	0.000	3623.290	0.000	0.000	0.000	New Alignment
941	68240	294.812	0.000	3082.835	0.000	0.000	0.000	New Alignment
942	68250	318.281	0.000	3065.465	0.000	0.000	0.000	New Alignment
943	68260	401.410	0.000	3598.455	0.000	0.000	0.000	New Alignment
944	68270	512.803	0.000	4571.065	0.000	0.000	0.000	New Alignment
945	68280	196.727	0.000	3547.650	0.000	0.000	0.000	New Alignment
946	68290	140.225	0.000	1684.760	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
947	68300	112.345	0.000	1262.850	0.000	0.000	0.000	New Alignment
948	68310	244.035	0.000	1781.900	0.000	0.000	0.000	New Alignment
949	68320	188.500	0.000	2162.675	0.000	0.000	0.000	New Alignment
950	68330	178.655	0.000	1835.775	0.000	0.000	0.000	New Alignment
951	68340	332.350	0.000	2555.025	0.000	0.000	0.000	New Alignment
952	68350	616.803	0.000	4745.765	0.000	0.000	0.000	New Alignment
953	68360	739.778	0.000	6782.905	0.000	0.000	0.000	New Alignment
954	68370	642.349	0.000	6910.635	0.000	0.000	0.000	New Alignment
955	68380	492.242	0.000	5672.955	0.000	0.000	0.000	New Alignment
956	68390	399.883	0.000	4460.625	0.000	0.000	0.000	New Alignment
957	68400	345.391	0.000	3726.370	0.000	0.000	0.000	New Alignment
958	68410	387.032	0.000	3662.115	0.000	0.000	0.000	New Alignment
959	68420	503.427	0.000	4452.295	0.000	0.000	0.000	New Alignment
960	68430	613.197	0.000	5583.120	0.000	0.000	0.000	New Alignment
961	68440	600.663	0.000	6069.300	0.000	0.000	0.000	New Alignment
962	68450	593.715	0.000	5971.890	0.000	0.000	0.000	New Alignment
963	68460	585.098	0.000	5894.065	0.000	0.000	0.000	New Alignment
964	68470	557.745	0.000	5714.215	0.000	0.000	0.000	New Alignment
965	68480	604.331	0.000	5810.380	0.000	0.000	0.000	New Alignment
966	68490	659.574	0.000	6319.525	0.000	0.000	0.000	New Alignment
967	68500	708.611	0.000	6840.925	0.000	0.000	0.000	New Alignment
968	68510	500.420	0.000	6045.155	0.000	0.000	0.000	New Alignment
969	68520	597.087	0.000	5487.535	0.000	0.000	0.000	New Alignment
970	68530	618.600	0.000	6078.435	0.000	0.000	0.000	New Alignment
971	68540	627.167	0.000	6228.835	0.000	0.000	0.000	New Alignment
972	68550	665.928	0.000	6465.475	0.000	0.000	0.000	New Alignment
973	68560	678.751	0.000	6723.395	0.000	0.000	0.000	New Alignment
974	68570	642.101	0.000	6604.260	0.000	0.000	0.000	New Alignment
975	68580	587.129	0.000	6146.150	0.000	0.000	0.000	New Alignment
976	68590	547.547	0.000	5673.380	0.000	0.000	0.000	New Alignment
977	68600	589.020	0.000	5682.835	0.000	0.000	0.000	New Alignment
978	68610	651.091	0.000	6200.555	0.000	0.000	0.000	New Alignment
979	68620	705.687	0.000	6783.890	0.000	0.000	0.000	New Alignment
980	68630	711.864	0.000	7087.755	0.000	0.000	0.000	New Alignment
981	68640	632.990	0.000	6724.270	0.000	0.000	0.000	New Alignment
982	68650	479.958	0.000	5564.740	0.000	0.000	0.000	New Alignment
983	68660	408.948	0.000	4444.530	0.000	0.000	0.000	New Alignment
984	68670	416.508	0.000	4127.280	0.000	0.000	0.000	New Alignment
985	68680	205.493	0.000	3110.005	0.000	0.000	0.000	New Alignment
986	68690	219.316	0.000	2124.045	0.000	0.000	0.000	New Alignment
987	68700	223.874	0.000	2215.950	0.000	0.000	0.000	New Alignment
988	68710	244.725	0.000	2342.995	0.000	0.000	0.000	New Alignment
989	68720	198.396	0.000	2215.605	0.000	0.000	0.000	New Alignment
990	68730	146.895	0.000	1726.455	0.000	0.000	0.000	New Alignment
991	68740	163.135	0.000	1550.150	0.000	0.000	0.000	New Alignment
992	68750	187.526	0.000	1753.305	0.000	0.000	0.000	New Alignment
993	68760	174.336	0.000	1809.310	0.000	0.000	0.000	New Alignment
994	68770	387.832	0.000	2810.840	0.000	0.000	0.000	New Alignment
995	68780	401.943	0.000	3948.875	0.000	0.000	0.000	New Alignment
996	68790	431.150	0.000	4165.465	0.000	0.000	0.000	New Alignment
997	68800	448.057	0.000	4396.035	0.000	0.000	0.000	New Alignment
998	68810	426.250	0.000	4371.535	0.000	0.000	0.000	New Alignment
999	68820	503.278	0.000	4647.640	0.000	0.000	0.000	New Alignment
1000	68830	586.230	0.000	5447.540	0.000	0.000	0.000	New Alignment
1001	68840	595.416	0.000	5908.230	0.000	0.000	0.000	New Alignment
1002	68850	553.390	0.000	5744.030	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
1003	68860	546.473	0.000	5499.315	0.000	0.000	0.000	New Alignment
1004	68870	536.827	0.000	5416.500	0.000	0.000	0.000	New Alignment
1005	68880	401.383	0.000	4691.050	0.000	0.000	0.000	New Alignment
1006	68890	316.161	0.000	3587.720	0.000	0.000	0.000	New Alignment
1007	68900	345.090	0.000	3306.255	0.000	0.000	0.000	New Alignment
1008	68910	433.525	0.000	3893.075	0.000	0.000	0.000	New Alignment
1009	68920	509.506	0.000	4715.155	0.000	0.000	0.000	New Alignment
1010	68930	415.998	0.000	4627.520	0.000	0.000	0.000	New Alignment
1011	68940	317.753	0.000	3668.755	0.000	0.000	0.000	New Alignment
1012	68950	301.108	0.000	3094.305	0.000	0.000	0.000	New Alignment
1013	68960	354.105	0.000	3276.065	0.000	0.000	0.000	New Alignment
1014	68970	433.168	0.000	3936.365	0.000	0.000	0.000	New Alignment
1015	68980	468.214	0.000	4506.910	0.000	0.000	0.000	New Alignment
1016	68990	397.785	0.000	4329.995	0.000	0.000	0.000	New Alignment
1017	69000	425.240	0.000	4115.125	0.000	0.000	0.000	New Alignment
1018	69010	568.109	0.000	4966.745	0.000	0.000	0.000	New Alignment
1019	69020	329.944	0.000	4490.265	0.000	0.000	0.000	New Alignment
1020	69030	403.168	0.000	3665.560	0.000	0.000	0.000	New Alignment
1021	69040	385.477	0.000	3943.225	0.000	0.000	0.000	New Alignment
1022	69050	382.301	0.000	3838.890	0.000	0.000	0.000	New Alignment
1023	69060	355.028	0.000	3686.645	0.000	0.000	0.000	New Alignment
1024	69070	519.256	0.000	4371.420	0.000	0.000	0.000	New Alignment
1025	69080	459.132	0.000	4891.940	0.000	0.000	0.000	New Alignment
1026	69090	485.178	0.000	4721.550	0.000	0.000	0.000	New Alignment
1027	69100	522.749	0.000	5039.635	0.000	0.000	0.000	New Alignment
1028	69110	456.537	0.000	4896.430	0.000	0.000	0.000	New Alignment
1029	69120	346.957	0.000	4017.470	0.000	0.000	0.000	New Alignment
1030	69130	301.595	0.000	3242.760	0.000	0.000	0.000	New Alignment
1031	69140	281.087	0.000	2913.410	0.000	0.000	0.000	New Alignment
1032	69150	286.889	0.000	2839.880	0.000	0.000	0.000	New Alignment
1033	69160	343.550	0.000	3152.195	0.000	0.000	0.000	New Alignment
1034	69170	384.449	0.000	3639.995	0.000	0.000	0.000	New Alignment
1035	69180	399.195	0.000	3918.220	0.000	0.000	0.000	New Alignment
1036	69190	407.554	0.000	4033.745	0.000	0.000	0.000	New Alignment
1037	69200	405.250	0.000	4064.020	0.000	0.000	0.000	New Alignment
1038	69210	372.027	0.000	3886.385	0.000	0.000	0.000	New Alignment
1039	69220	359.089	0.000	3655.580	0.000	0.000	0.000	New Alignment
1040	69230	380.507	0.000	3697.980	0.000	0.000	0.000	New Alignment
1041	69240	499.825	0.000	4401.660	0.000	0.000	0.000	New Alignment
1042	69250	520.583	0.000	5102.040	0.000	0.000	0.000	New Alignment
1043	69260	271.233	0.000	3959.080	0.000	0.000	0.000	New Alignment
1044	69270	278.300	0.000	2747.665	0.000	0.000	0.000	New Alignment
1045	69280	439.722	0.000	3590.110	0.000	0.000	0.000	New Alignment
1046	69290	192.872	0.000	3162.970	0.000	0.000	0.000	New Alignment
1047	69300	256.255	0.000	2245.635	0.000	0.000	0.000	New Alignment
1048	69310	565.034	0.000	4106.445	0.000	0.000	0.000	New Alignment
1049	69320	642.462	0.000	6037.480	0.000	0.000	0.000	New Alignment
1050	69330	711.170	0.000	6768.160	0.000	0.000	0.000	New Alignment
1051	69340	663.820	0.000	6874.950	0.000	0.000	0.000	New Alignment
1052	69350	609.608	0.000	6367.140	0.000	0.000	0.000	New Alignment
1053	69360	565.643	0.000	5876.255	0.000	0.000	0.000	New Alignment
1054	69370	532.372	0.000	5490.075	0.000	0.000	0.000	New Alignment
1055	69380	511.608	0.000	5219.900	0.000	0.000	0.000	New Alignment
1056	69390	279.662	0.000	3956.350	0.000	0.000	0.000	New Alignment
1057	69400	242.627	0.000	2611.445	0.000	0.000	0.000	New Alignment
1058	69410	201.780	0.000	2222.035	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
1059	69420	199.920	0.000	2008.500	0.000	0.000	0.000	New Alignment
1060	69430	213.517	0.000	2067.185	0.000	0.000	0.000	New Alignment
1061	69440	454.388	0.000	3339.525	0.000	0.000	0.000	New Alignment
1062	69450	456.831	0.000	4556.095	0.000	0.000	0.000	New Alignment
1063	69460	464.620	0.000	4607.255	0.000	0.000	0.000	New Alignment
1064	69470	450.384	0.000	4575.020	0.000	0.000	0.000	New Alignment
1065	69480	413.181	0.000	4317.825	0.000	0.000	0.000	New Alignment
1066	69490	382.191	0.000	3976.860	0.000	0.000	0.000	New Alignment
1067	69500	416.244	0.000	3992.175	0.000	0.000	0.000	New Alignment
1068	69510	412.620	0.000	4144.320	0.000	0.000	0.000	New Alignment
1069	69520	420.014	0.000	4163.170	0.000	0.000	0.000	New Alignment
1070	69530	421.890	0.000	4209.520	0.000	0.000	0.000	New Alignment
1071	69540	369.526	0.000	3957.080	0.000	0.000	0.000	New Alignment
1072	69550	316.753	0.000	3431.395	0.000	0.000	0.000	New Alignment
1073	69560	300.020	0.000	3083.865	0.000	0.000	0.000	New Alignment
1074	69570	262.152	0.000	2810.860	0.000	0.000	0.000	New Alignment
1075	69580	235.995	0.000	2490.735	0.000	0.000	0.000	New Alignment
1076	69590	207.520	0.000	2217.575	0.000	0.000	0.000	New Alignment
1077	69600	155.275	0.000	1813.975	0.000	0.000	0.000	New Alignment
1078	69610	101.658	0.000	1284.665	0.000	0.000	0.000	New Alignment
1079	69620	84.917	0.000	932.875	0.000	0.000	0.000	New Alignment
1080	69630	52.967	2.784	689.420	13.920	0.000	13.920	New Alignment
1081	69640	48.633	4.877	508.000	38.305	0.000	38.305	New Alignment
1082	69650	38.063	8.134	433.480	65.055	12.555	52.500	New Alignment
1083	69660	26.337	14.695	322.000	114.145	61.645	52.500	New Alignment
1084	69670	18.685	21.537	225.110	181.160	128.660	52.500	New Alignment
1085	69680	13.547	21.818	161.160	216.775	164.275	52.500	New Alignment
1086	69690	20.548	16.884	170.475	193.510	141.010	52.500	New Alignment
1087	69700	52.258	0.344	364.030	86.140	33.640	52.500	New Alignment
1088	69710	94.556	0.000	734.070	1.720	0.000	1.720	New Alignment
1089	69720	81.430	0.000	879.930	0.000	0.000	0.000	New Alignment
1090	69730	79.359	0.000	803.945	0.000	0.000	0.000	New Alignment
1091	69740	98.287	0.000	888.230	0.000	0.000	0.000	New Alignment
1092	69750	130.679	0.000	1144.830	0.000	0.000	0.000	New Alignment
1093	69760	190.737	0.000	1607.080	0.000	0.000	0.000	New Alignment
1094	69770	232.035	0.000	2113.860	0.000	0.000	0.000	New Alignment
1095	69780	222.851	0.000	2274.430	0.000	0.000	0.000	New Alignment
1096	69790	171.843	0.000	1973.470	0.000	0.000	0.000	New Alignment
1097	69800	136.487	0.000	1541.650	0.000	0.000	0.000	New Alignment
1098	69810	118.405	0.000	1274.460	0.000	0.000	0.000	New Alignment
1099	69820	100.745	0.000	1095.750	0.000	0.000	0.000	New Alignment
1100	69830	74.024	0.000	873.845	0.000	0.000	0.000	New Alignment
1101	69840	68.520	0.000	712.720	0.000	0.000	0.000	New Alignment
1102	69850	56.553	0.000	625.365	0.000	0.000	0.000	New Alignment
1103	69860	78.924	0.000	677.385	0.000	0.000	0.000	New Alignment
1104	69870	141.810	0.000	1103.670	0.000	0.000	0.000	New Alignment
1105	69880	184.972	0.000	1633.910	0.000	0.000	0.000	New Alignment
1106	69890	201.799	0.000	1933.855	0.000	0.000	0.000	New Alignment
1107	69900	212.902	0.000	2073.505	0.000	0.000	0.000	New Alignment
1108	69910	219.183	0.000	2160.425	0.000	0.000	0.000	New Alignment
1109	69920	241.254	0.000	2302.185	0.000	0.000	0.000	New Alignment
1110	69930	250.490	0.000	2458.720	0.000	0.000	0.000	New Alignment
1111	69940	267.571	0.000	2590.305	0.000	0.000	0.000	New Alignment
1112	69950	281.736	0.000	2746.535	0.000	0.000	0.000	New Alignment
1113	69960	259.866	0.000	2708.010	0.000	0.000	0.000	New Alignment
1114	69970	260.351	0.000	2601.085	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
1115	69980	277.391	0.000	2688.710	0.000	0.000	0.000	New Alignment
1116	69990	293.044	0.000	2852.175	0.000	0.000	0.000	New Alignment
1117	70000	286.245	0.000	2896.445	0.000	0.000	0.000	New Alignment
1118	70010	237.314	0.000	2617.795	0.000	0.000	0.000	New Alignment
1119	70020	148.649	0.000	1929.815	0.000	0.000	0.000	New Alignment
1120	70030	103.078	0.000	1258.635	0.000	0.000	0.000	New Alignment
1121	70040	64.425	0.000	837.515	0.000	0.000	0.000	New Alignment
1122	70050	13.323	6.917	388.740	34.585	0.000	34.585	New Alignment
1123	70060	0.040	49.204	66.815	0.000	0.000	0.000	BR
1124	70070	0.000	108.519	0.200	0.000	0.000	0.000	BR
1125	70080	0.000	173.698	0.000	0.000	0.000	0.000	BR
1126	70090	0.000	172.062	0.000	0.000	0.000	0.000	BR
1127	70100	0.000	174.093	0.000	0.000	0.000	0.000	BR
1128	70110	0.000	124.252	0.000	0.000	0.000	0.000	BR
1129	70120	5.400	12.916	27.000	685.840	633.340	52.500	New Alignment
1130	70130	123.380	0.000	643.900	64.580	12.080	52.500	New Alignment
1131	70140	217.675	0.000	1705.275	0.000	0.000	0.000	New Alignment
1132	70150	293.190	0.000	2554.325	0.000	0.000	0.000	New Alignment
1133	70160	374.393	0.000	3337.915	0.000	0.000	0.000	New Alignment
1134	70170	385.968	0.000	3801.805	0.000	0.000	0.000	New Alignment
1135	70180	342.231	0.000	3640.995	0.000	0.000	0.000	New Alignment
1136	70190	361.507	0.000	3518.690	0.000	0.000	0.000	New Alignment
1137	70200	281.419	0.000	3214.630	0.000	0.000	0.000	New Alignment
1138	70210	179.258	0.000	2303.385	0.000	0.000	0.000	New Alignment
1139	70220	144.831	0.000	1620.445	0.000	0.000	0.000	New Alignment
1140	70230	142.082	0.000	1434.565	0.000	0.000	0.000	New Alignment
1141	70240	122.326	0.000	1322.040	0.000	0.000	0.000	New Alignment
1142	70250	102.116	0.000	1122.210	0.000	0.000	0.000	New Alignment
1143	70260	101.215	0.000	1016.655	0.000	0.000	0.000	New Alignment
1144	70270	108.012	0.000	1046.135	0.000	0.000	0.000	New Alignment
1145	70280	117.657	0.000	1128.345	0.000	0.000	0.000	New Alignment
1146	70290	86.943	0.000	1023.000	0.000	0.000	0.000	New Alignment
1147	70300	104.147	0.000	955.450	0.000	0.000	0.000	New Alignment
1148	70310	145.959	0.000	1250.530	0.000	0.000	0.000	New Alignment
1149	70320	162.650	0.000	1543.045	0.000	0.000	0.000	New Alignment
1150	70330	124.075	0.000	1433.625	0.000	0.000	0.000	New Alignment
1151	70340	96.110	0.000	1100.925	0.000	0.000	0.000	New Alignment
1152	70350	87.461	0.000	917.855	0.000	0.000	0.000	New Alignment
1153	70360	83.928	0.000	856.945	0.000	0.000	0.000	New Alignment
1154	70370	87.265	0.000	855.965	0.000	0.000	0.000	New Alignment
1155	70380	100.963	0.000	941.140	0.000	0.000	0.000	New Alignment
1156	70390	108.950	0.000	1049.565	0.000	0.000	0.000	New Alignment
1157	70400	101.839	0.000	1053.945	0.000	0.000	0.000	New Alignment
1158	70410	85.266	0.000	935.525	0.000	0.000	0.000	New Alignment
1159	70420	78.491	0.000	818.785	0.000	0.000	0.000	New Alignment
1160	70430	78.879	0.000	786.850	0.000	0.000	0.000	New Alignment
1161	70440	69.671	0.000	742.750	0.000	0.000	0.000	New Alignment
1162	70450	68.283	0.000	689.770	0.000	0.000	0.000	New Alignment
1163	70460	93.359	0.000	808.210	0.000	0.000	0.000	New Alignment
1164	70470	79.729	0.000	865.440	0.000	0.000	0.000	New Alignment
1165	70480	81.902	0.000	808.155	0.000	0.000	0.000	New Alignment
1166	70490	86.594	0.000	842.480	0.000	0.000	0.000	New Alignment
1167	70500	81.196	0.000	838.950	0.000	0.000	0.000	New Alignment
1168	70510	76.331	0.000	787.635	0.000	0.000	0.000	New Alignment
1169	70520	72.890	0.000	746.105	0.000	0.000	0.000	New Alignment
1170	70530	91.443	0.000	821.665	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
1171	70540	120.261	0.000	1058.520	0.000	0.000	0.000	New Alignment
1172	70550	149.562	0.000	1349.115	0.000	0.000	0.000	New Alignment
1173	70560	136.144	0.000	1428.530	0.000	0.000	0.000	New Alignment
1174	70570	107.686	0.000	1219.150	0.000	0.000	0.000	New Alignment
1175	70580	37.763	0.000	727.245	0.000	0.000	0.000	New Alignment
1176	70590	0.000	192.388	188.815	0.000	0.000	0.000	BR
1177	70600	0.000	515.428	0.000	0.000	0.000	0.000	BR
1178	70610	0.000	593.337	0.000	0.000	0.000	0.000	BR
1179	70620	0.000	496.358	0.000	0.000	0.000	0.000	BR
1180	70630	0.000	400.145	0.000	0.000	0.000	0.000	BR
1181	70640	0.000	289.160	0.000	0.000	0.000	0.000	BR
1182	70650	0.000	156.680	0.000	0.000	0.000	0.000	BR
1183	70660	0.000	34.970	0.000	0.000	0.000	0.000	BR
1184	70670	53.066	0.000	265.330	174.850	122.350	52.500	New Alignment
1185	70680	104.234	0.000	786.500	0.000	0.000	0.000	New Alignment
1186	70690	179.931	0.000	1420.825	0.000	0.000	0.000	New Alignment
1187	70700	218.825	0.000	1993.780	0.000	0.000	0.000	New Alignment
1188	70710	143.236	0.000	1810.305	0.000	0.000	0.000	New Alignment
1189	70720	47.630	0.000	954.330	0.000	0.000	0.000	New Alignment
1190	70730	12.399	2.426	300.145	12.130	0.000	12.130	New Alignment
1191	70740	4.631	17.633	85.150	100.295	47.795	52.500	New Alignment
1192	70750	37.943	2.262	212.870	99.475	46.975	52.500	New Alignment
1193	70760	52.662	0.012	453.025	11.370	0.000	11.370	New Alignment
1194	70770	29.879	1.795	412.705	9.035	0.000	9.035	New Alignment
1195	70780	31.586	3.588	307.325	26.915	0.000	26.915	New Alignment
1196	70790	41.840	3.610	367.130	35.990	0.000	35.990	New Alignment
1197	70800	56.981	0.916	494.105	22.630	0.000	22.630	New Alignment
1198	70810	61.222	0.000	591.015	4.580	0.000	4.580	New Alignment
1199	70820	52.380	0.000	568.010	0.000	0.000	0.000	New Alignment
1200	70830	94.143	0.000	732.615	0.000	0.000	0.000	New Alignment
1201	70840	180.909	0.000	1375.260	0.000	0.000	0.000	New Alignment
1202	70850	255.655	0.000	2182.820	0.000	0.000	0.000	New Alignment
1203	70860	193.724	1.073	2246.895	5.365	0.000	5.365	New Alignment
1204	70870	146.178	4.250	1699.510	26.615	0.000	26.615	New Alignment
1205	70880	103.460	0.314	1248.190	22.820	0.000	22.820	New Alignment
1206	70890	44.867	0.000	741.635	1.570	0.000	1.570	New Alignment
1207	70900	83.028	0.000	639.475	0.000	0.000	0.000	New Alignment
1208	70910	487.605	0.000	2853.165	0.000	0.000	0.000	New Alignment
1209	70920	773.686	0.000	6306.455	0.000	0.000	0.000	New Alignment
1210	70930	289.504	0.000	5315.950	0.000	0.000	0.000	New Alignment
1211	70940	226.645	0.000	2580.745	0.000	0.000	0.000	New Alignment
1212	70950	271.822	0.000	2492.335	0.000	0.000	0.000	New Alignment
1213	70960	157.661	0.000	2147.415	0.000	0.000	0.000	New Alignment
1214	70970	110.544	0.000	1341.025	0.000	0.000	0.000	New Alignment
1215	70980	89.692	0.000	1001.180	0.000	0.000	0.000	New Alignment
1216	70990	67.101	0.000	783.965	0.000	0.000	0.000	New Alignment
1217	71000	58.012	0.000	625.565	0.000	0.000	0.000	New Alignment
1218	71010	62.927	0.000	604.695	0.000	0.000	0.000	New Alignment
1219	71020	70.989	0.000	669.580	0.000	0.000	0.000	New Alignment
1220	71030	114.176	0.000	925.825	0.000	0.000	0.000	New Alignment
1221	71040	207.038	0.000	1606.070	0.000	0.000	0.000	New Alignment
1222	71050	302.908	0.000	2549.730	0.000	0.000	0.000	New Alignment
1223	71060	252.615	0.001	2777.615	0.005	0.000	0.005	New Alignment
1224	71070	185.802	0.001	2192.085	0.010	0.000	0.010	New Alignment
1225	71080	133.012	0.014	1594.070	0.075	0.000	0.075	New Alignment
1226	71090	113.629	2.264	1233.205	11.390	0.000	11.390	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
1227	71100	88.670	0.627	1011.495	14.455	0.000	14.455	New Alignment
1228	71110	25.217	2.095	569.435	13.610	0.000	13.610	New Alignment
1229	71120	4.329	12.639	147.730	73.670	21.170	52.500	New Alignment
1230	71130	2.450	1.036	33.895	68.375	15.875	52.500	New Alignment
1231	71140	29.349	0.265	158.995	6.505	0.000	6.505	New Alignment
1232	71150	51.476	0.130	404.125	1.975	0.000	1.975	New Alignment
1233	71160	29.552	0.444	405.140	2.870	0.000	2.870	New Alignment
1234	71170	35.112	1.718	323.320	10.810	0.000	10.810	New Alignment
1235	71180	47.202	1.718	411.570	17.180	0.000	17.180	New Alignment
1236	71190	79.873	2.997	635.375	23.575	0.000	23.575	New Alignment
1237	71200	76.143	0.002	780.080	14.995	0.000	14.995	New Alignment
1238	71210	71.606	0.000	738.745	0.010	0.000	0.010	New Alignment
1239	71220	39.656	0.000	556.310	0.000	0.000	0.000	New Alignment
1240	71230	31.032	0.449	353.440	2.245	0.000	2.245	New Alignment
1241	71240	45.994	0.009	385.130	2.290	0.000	2.290	New Alignment
1242	71250	48.076	0.000	470.350	0.045	0.000	0.045	New Alignment
1243	71260	83.326	0.000	657.010	0.000	0.000	0.000	New Alignment
1244	71270	85.738	0.000	845.320	0.000	0.000	0.000	New Alignment
1245	71280	69.596	0.000	776.670	0.000	0.000	0.000	New Alignment
1246	71290	41.534	0.000	555.650	0.000	0.000	0.000	New Alignment
1247	71300	27.746	0.000	346.400	0.000	0.000	0.000	New Alignment
1248	71310	43.112	0.000	354.290	0.000	0.000	0.000	New Alignment
1249	71320	75.497	0.000	593.045	0.000	0.000	0.000	New Alignment
1250	71330	91.760	0.000	836.285	0.000	0.000	0.000	New Alignment
1251	71340	78.183	0.000	849.715	0.000	0.000	0.000	New Alignment
1252	71350	68.793	0.000	734.880	0.000	0.000	0.000	New Alignment
1253	71360	68.456	0.000	686.245	0.000	0.000	0.000	New Alignment
1254	71370	44.492	0.000	564.740	0.000	0.000	0.000	New Alignment
1255	71380	48.871	0.000	466.815	0.000	0.000	0.000	New Alignment
1256	71390	73.354	0.000	611.125	0.000	0.000	0.000	New Alignment
1257	71400	120.072	0.000	967.130	0.000	0.000	0.000	New Alignment
1258	71410	140.550	0.000	1303.110	0.000	0.000	0.000	New Alignment
1259	71420	148.902	0.000	1447.260	0.000	0.000	0.000	New Alignment
1260	71430	144.276	0.000	1465.890	0.000	0.000	0.000	New Alignment
1261	71440	99.265	0.000	1217.705	0.000	0.000	0.000	New Alignment
1262	71450	67.158	0.000	832.115	0.000	0.000	0.000	New Alignment
1263	71460	66.552	0.000	668.550	0.000	0.000	0.000	New Alignment
1264	71470	94.330	0.000	804.410	0.000	0.000	0.000	New Alignment
1265	71480	125.717	0.000	1100.235	0.000	0.000	0.000	New Alignment
1266	71490	150.391	0.000	1380.540	0.000	0.000	0.000	New Alignment
1267	71500	94.756	0.000	1225.735	0.000	0.000	0.000	New Alignment
1268	71510	56.504	0.000	756.300	0.000	0.000	0.000	New Alignment
1269	71520	39.680	0.000	480.920	0.000	0.000	0.000	New Alignment
1270	71530	31.827	0.000	357.535	0.000	0.000	0.000	New Alignment
1271	71540	41.395	0.000	366.110	0.000	0.000	0.000	New Alignment
1272	71550	41.233	0.000	413.140	0.000	0.000	0.000	New Alignment
1273	71560	47.786	0.000	445.095	0.000	0.000	0.000	New Alignment
1274	71570	29.384	0.000	385.850	0.000	0.000	0.000	New Alignment
1275	71580	33.125	0.008	312.545	0.040	0.000	0.040	New Alignment
1276	71590	27.372	0.000	302.485	0.040	0.000	0.040	New Alignment
1277	71600	17.955	0.015	226.635	0.075	0.000	0.075	New Alignment
1278	71610	21.936	0.267	199.455	1.410	0.000	1.410	New Alignment
1279	71620	14.398	4.870	181.670	25.685	0.000	25.685	New Alignment
1280	71630	7.000	6.463	106.990	56.665	4.165	52.500	New Alignment
1281	71640	7.693	13.213	73.465	98.380	45.880	52.500	New Alignment
1282	71650	10.635	5.970	91.640	95.915	43.415	52.500	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
1283	71660	43.562	0.004	270.985	29.870	0.000	29.870	New Alignment
1284	71670	38.159	0.000	408.605	0.020	0.000	0.020	New Alignment
1285	71680	64.323	0.000	512.410	0.000	0.000	0.000	New Alignment
1286	71690	51.502	0.000	579.125	0.000	0.000	0.000	New Alignment
1287	71700	58.378	0.000	549.400	0.000	0.000	0.000	New Alignment
1288	71710	56.736	0.000	575.570	0.000	0.000	0.000	New Alignment
1289	71720	54.006	0.000	553.710	0.000	0.000	0.000	New Alignment
1290	71730	52.709	0.000	533.575	0.000	0.000	0.000	New Alignment
1291	71740	51.983	0.000	523.460	0.000	0.000	0.000	New Alignment
1292	71750	42.069	0.000	470.260	0.000	0.000	0.000	New Alignment
1293	71760	35.828	0.000	389.485	0.000	0.000	0.000	New Alignment
1294	71770	54.247	0.000	450.375	0.000	0.000	0.000	New Alignment
1295	71780	42.848	0.000	485.475	0.000	0.000	0.000	New Alignment
1296	71790	78.960	0.000	609.040	0.000	0.000	0.000	New Alignment
1297	71800	89.771	0.000	843.655	0.000	0.000	0.000	New Alignment
1298	71810	125.389	0.000	1075.800	0.000	0.000	0.000	New Alignment
1299	71820	89.445	0.000	1074.170	0.000	0.000	0.000	New Alignment
1300	71830	81.731	0.000	855.880	0.000	0.000	0.000	New Alignment
1301	71840	58.017	0.016	698.740	0.080	0.000	0.080	New Alignment
1302	71850	51.184	0.000	546.005	0.080	0.000	0.080	New Alignment
1303	71860	32.593	0.010	418.885	0.050	0.000	0.050	New Alignment
1304	71870	44.009	0.000	383.010	0.050	0.000	0.050	New Alignment
1305	71880	51.724	0.000	478.665	0.000	0.000	0.000	New Alignment
1306	71890	82.168	0.093	669.460	0.465	0.000	0.465	New Alignment
1307	71900	16.010	4.288	490.890	21.905	0.000	21.905	New Alignment
1308	71910	37.880	9.436	269.450	68.620	16.120	52.500	New Alignment
1309	71920	57.767	9.146	478.235	92.910	40.410	52.500	New Alignment
1310	71930	29.127	5.469	434.470	73.075	20.575	52.500	New Alignment
1311	71940	45.014	0.000	370.705	27.345	0.000	27.345	New Alignment
1312	71950	46.093	0.000	455.535	0.000	0.000	0.000	New Alignment
1313	71960	60.319	0.000	532.060	0.000	0.000	0.000	New Alignment
1314	71970	77.593	0.000	689.560	0.000	0.000	0.000	New Alignment
1315	71980	60.264	0.000	689.285	0.000	0.000	0.000	New Alignment
1316	71990	44.747	0.000	525.055	0.000	0.000	0.000	New Alignment
1317	72000	47.392	0.000	460.695	0.000	0.000	0.000	New Alignment
1318	72010	74.989	0.000	611.905	0.000	0.000	0.000	New Alignment
1319	72020	60.046	0.000	675.175	0.000	0.000	0.000	New Alignment
1320	72030	63.514	0.000	617.800	0.000	0.000	0.000	New Alignment
1321	72040	65.204	0.000	643.590	0.000	0.000	0.000	New Alignment
1322	72050	63.439	0.000	643.215	0.000	0.000	0.000	New Alignment
1323	72060	75.978	0.000	697.085	0.000	0.000	0.000	New Alignment
1324	72070	75.840	0.000	759.090	0.000	0.000	0.000	New Alignment
1325	72080	43.235	0.010	595.375	0.050	0.000	0.050	New Alignment
1326	72090	41.780	0.000	425.075	0.050	0.000	0.050	New Alignment
1327	72100	74.349	0.000	580.645	0.000	0.000	0.000	New Alignment
1328	72110	98.031	0.000	861.900	0.000	0.000	0.000	New Alignment
1329	72120	61.196	0.000	796.135	0.000	0.000	0.000	New Alignment
1330	72130	38.332	0.000	497.640	0.000	0.000	0.000	New Alignment
1331	72140	23.338	1.416	308.350	7.080	0.000	7.080	New Alignment
1332	72150	35.405	0.173	293.715	7.945	0.000	7.945	New Alignment
1333	72160	45.540	0.000	404.725	0.865	0.000	0.865	New Alignment
1334	72170	51.118	0.000	483.290	0.000	0.000	0.000	New Alignment
1335	72180	42.742	0.000	469.300	0.000	0.000	0.000	New Alignment
1336	72190	32.241	0.000	374.915	0.000	0.000	0.000	New Alignment
1337	72200	26.829	0.033	295.350	0.165	0.000	0.165	New Alignment
1338	72210	27.483	0.013	271.560	0.230	0.000	0.230	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
1339	72220	26.092	0.000	267.875	0.065	0.000	0.065	New Alignment
1340	72230	39.080	0.262	325.860	1.310	0.000	1.310	New Alignment
1341	72240	35.802	0.711	374.410	4.865	0.000	4.865	New Alignment
1342	72250	67.360	0.000	515.810	3.555	0.000	3.555	New Alignment
1343	72260	71.545	0.000	694.525	0.000	0.000	0.000	New Alignment
1344	72270	81.236	0.000	763.905	0.000	0.000	0.000	New Alignment
1345	72280	100.402	0.000	908.190	0.000	0.000	0.000	New Alignment
1346	72290	131.234	0.000	1158.180	0.000	0.000	0.000	New Alignment
1347	72300	123.036	0.000	1271.350	0.000	0.000	0.000	New Alignment
1348	72310	108.921	0.000	1159.785	0.000	0.000	0.000	New Alignment
1349	72320	92.664	0.000	1007.925	0.000	0.000	0.000	New Alignment
1350	72330	84.280	0.000	884.720	0.000	0.000	0.000	New Alignment
1351	72340	66.943	0.000	756.115	0.000	0.000	0.000	New Alignment
1352	72350	60.757	0.000	638.500	0.000	0.000	0.000	New Alignment
1353	72360	65.627	0.000	631.920	0.000	0.000	0.000	New Alignment
1354	72370	67.315	0.000	664.710	0.000	0.000	0.000	New Alignment
1355	72380	72.410	0.000	698.625	0.000	0.000	0.000	New Alignment
1356	72390	80.603	0.000	765.065	0.000	0.000	0.000	New Alignment
1357	72400	99.242	0.000	899.225	0.000	0.000	0.000	New Alignment
1358	72410	103.618	0.000	1014.300	0.000	0.000	0.000	New Alignment
1359	72420	111.356	0.000	1074.870	0.000	0.000	0.000	New Alignment
1360	72430	102.458	0.000	1069.070	0.000	0.000	0.000	New Alignment
1361	72440	102.914	0.000	1026.860	0.000	0.000	0.000	New Alignment
1362	72450	93.084	0.000	979.990	0.000	0.000	0.000	New Alignment
1363	72460	94.785	0.000	939.345	0.000	0.000	0.000	New Alignment
1364	72470	81.203	0.000	879.940	0.000	0.000	0.000	New Alignment
1365	72480	69.928	0.000	755.655	0.000	0.000	0.000	New Alignment
1366	72490	56.714	0.000	633.210	0.000	0.000	0.000	New Alignment
1367	72500	74.567	0.000	656.405	0.000	0.000	0.000	New Alignment
1368	72510	62.020	1.667	682.935	8.335	0.000	8.335	New Alignment
1369	72520	59.013	0.000	605.165	8.335	0.000	8.335	New Alignment
1370	72530	57.051	0.000	580.320	0.000	0.000	0.000	New Alignment
1371	72540	51.889	0.000	544.700	0.000	0.000	0.000	New Alignment
1372	72550	44.526	0.000	482.075	0.000	0.000	0.000	New Alignment
1373	72560	51.388	0.000	479.570	0.000	0.000	0.000	New Alignment
1374	72570	48.206	0.000	497.970	0.000	0.000	0.000	New Alignment
1375	72580	49.958	0.000	490.820	0.000	0.000	0.000	New Alignment
1376	72590	33.128	0.000	415.430	0.000	0.000	0.000	New Alignment
1377	72600	22.427	0.000	277.775	0.000	0.000	0.000	New Alignment
1378	72610	23.984	0.000	232.055	0.000	0.000	0.000	New Alignment
1379	72620	50.154	0.000	370.690	0.000	0.000	0.000	New Alignment
1380	72630	74.837	0.000	624.955	0.000	0.000	0.000	New Alignment
1381	72640	50.605	0.000	627.210	0.000	0.000	0.000	New Alignment
1382	72650	28.950	0.000	397.775	0.000	0.000	0.000	New Alignment
1383	72660	33.997	0.403	314.735	2.015	0.000	2.015	New Alignment
1384	72670	31.780	0.000	328.885	2.015	0.000	2.015	New Alignment
1385	72680	38.394	0.000	350.870	0.000	0.000	0.000	New Alignment
1386	72690	34.488	0.000	364.410	0.000	0.000	0.000	New Alignment
1387	72700	52.322	0.000	434.050	0.000	0.000	0.000	New Alignment
1388	72710	54.800	0.000	535.610	0.000	0.000	0.000	New Alignment
1389	72720	57.131	0.000	559.655	0.000	0.000	0.000	New Alignment
1390	72730	67.316	0.000	622.235	0.000	0.000	0.000	New Alignment
1391	72740	68.391	0.000	678.535	0.000	0.000	0.000	New Alignment
1392	72750	45.715	0.000	570.530	0.000	0.000	0.000	New Alignment
1393	72760	37.906	0.000	418.105	0.000	0.000	0.000	New Alignment
1394	72770	49.727	0.000	438.165	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
1395	72780	25.407	0.000	375.670	0.000	0.000	0.000	New Alignment
1396	72790	22.035	0.000	237.210	0.000	0.000	0.000	New Alignment
1397	72800	36.812	0.000	294.235	0.000	0.000	0.000	New Alignment
1398	72810	26.632	0.000	317.220	0.000	0.000	0.000	New Alignment
1399	72820	19.947	0.027	232.895	0.135	0.000	0.135	New Alignment
1400	72830	10.589	2.473	152.680	12.500	0.000	12.500	New Alignment
1401	72840	24.866	0.012	177.275	12.425	0.000	12.425	New Alignment
1402	72850	75.365	0.000	501.155	0.060	0.000	0.060	New Alignment
1403	72860	89.726	0.000	825.455	0.000	0.000	0.000	New Alignment
1404	72870	97.666	0.000	936.960	0.000	0.000	0.000	New Alignment
1405	72880	110.054	0.000	1038.600	0.000	0.000	0.000	New Alignment
1406	72890	130.974	0.000	1205.140	0.000	0.000	0.000	New Alignment
1407	72900	115.313	0.000	1231.435	0.000	0.000	0.000	New Alignment
1408	72910	89.366	0.000	1023.395	0.000	0.000	0.000	New Alignment
1409	72920	76.838	0.000	831.020	0.000	0.000	0.000	New Alignment
1410	72930	96.642	0.000	867.400	0.000	0.000	0.000	New Alignment
1411	72940	89.193	0.000	929.175	0.000	0.000	0.000	New Alignment
1412	72950	101.808	0.000	955.005	0.000	0.000	0.000	New Alignment
1413	72960	71.764	0.000	867.860	0.000	0.000	0.000	New Alignment
1414	72970	38.809	0.531	552.865	2.655	0.000	2.655	New Alignment
1415	72980	54.700	0.001	467.545	2.660	0.000	2.660	New Alignment
1416	72990	102.468	0.000	785.840	0.005	0.000	0.005	New Alignment
1417	73000	162.331	0.000	1323.995	0.000	0.000	0.000	New Alignment
1418	73010	202.413	0.000	1823.720	0.000	0.000	0.000	New Alignment
1419	73020	128.392	0.000	1654.025	0.000	0.000	0.000	New Alignment
1420	73030	101.081	0.000	1147.365	0.000	0.000	0.000	New Alignment
1421	73040	140.122	0.000	1206.015	0.000	0.000	0.000	New Alignment
1422	73050	135.852	0.000	1379.870	0.000	0.000	0.000	New Alignment
1423	73060	94.862	0.000	1153.570	0.000	0.000	0.000	New Alignment
1424	73070	63.500	0.000	791.810	0.000	0.000	0.000	New Alignment
1425	73080	63.681	0.027	635.905	0.135	0.000	0.135	New Alignment
1426	73090	76.973	0.000	703.270	0.135	0.000	0.135	New Alignment
1427	73100	143.782	0.000	1103.775	0.000	0.000	0.000	New Alignment
1428	73110	134.461	0.000	1391.215	0.000	0.000	0.000	New Alignment
1429	73120	134.478	0.000	1344.695	0.000	0.000	0.000	New Alignment
1430	73130	117.836	0.000	1261.570	0.000	0.000	0.000	New Alignment
1431	73140	76.609	0.000	972.225	0.000	0.000	0.000	New Alignment
1432	73150	65.327	0.000	709.680	0.000	0.000	0.000	New Alignment
1433	73160	60.301	0.995	628.140	4.975	0.000	4.975	New Alignment
1434	73170	131.231	6.998	957.660	39.965	0.000	39.965	New Alignment
1435	73180	65.267	3.631	982.490	53.145	0.645	52.500	New Alignment
1436	73190	38.301	0.067	517.840	18.490	0.000	18.490	New Alignment
1437	73200	65.404	0.355	518.525	2.110	0.000	2.110	New Alignment
1438	73210	29.610	0.068	475.070	2.115	0.000	2.115	New Alignment
1439	73220	60.052	0.000	448.310	0.340	0.000	0.340	New Alignment
1440	73230	51.761	0.000	559.065	0.000	0.000	0.000	New Alignment
1441	73240	42.840	0.000	473.005	0.000	0.000	0.000	New Alignment
1442	73250	39.199	0.009	410.195	0.045	0.000	0.045	New Alignment
1443	73260	41.738	0.000	404.685	0.045	0.000	0.045	New Alignment
1444	73270	72.467	0.000	571.025	0.000	0.000	0.000	New Alignment
1445	73280	68.261	0.000	703.640	0.000	0.000	0.000	New Alignment
1446	73290	50.585	0.000	594.230	0.000	0.000	0.000	New Alignment
1447	73300	128.372	0.000	894.785	0.000	0.000	0.000	New Alignment
1448	73310	187.442	0.000	1579.070	0.000	0.000	0.000	New Alignment
1449	73320	215.609	0.000	2015.255	0.000	0.000	0.000	New Alignment
1450	73330	202.409	0.000	2090.090	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
1451	73340	227.801	0.000	2151.050	0.000	0.000	0.000	New Alignment
1452	73350	235.453	0.000	2316.270	0.000	0.000	0.000	New Alignment
1453	73360	111.867	0.000	1736.600	0.000	0.000	0.000	New Alignment
1454	73370	61.716	2.368	867.915	11.840	0.000	11.840	New Alignment
1455	73380	115.462	2.161	885.890	22.645	0.000	22.645	New Alignment
1456	73390	189.433	0.000	1524.475	10.805	0.000	10.805	New Alignment
1457	73400	229.434	0.000	2094.335	0.000	0.000	0.000	New Alignment
1458	73410	302.974	0.000	2662.040	0.000	0.000	0.000	New Alignment
1459	73420	373.096	0.000	3380.350	0.000	0.000	0.000	New Alignment
1460	73430	362.953	0.000	3680.245	0.000	0.000	0.000	New Alignment
1461	73440	330.129	0.000	3465.410	0.000	0.000	0.000	New Alignment
1462	73450	304.303	0.000	3172.160	0.000	0.000	0.000	New Alignment
1463	73460	266.986	0.000	2856.445	0.000	0.000	0.000	New Alignment
1464	73470	153.680	0.000	2103.330	0.000	0.000	0.000	New Alignment
1465	73480	99.962	0.000	1268.210	0.000	0.000	0.000	New Alignment
1466	73490	101.394	0.000	1006.780	0.000	0.000	0.000	New Alignment
1467	73500	156.136	0.000	1287.650	0.000	0.000	0.000	New Alignment
1468	73510	235.205	0.000	1956.705	0.000	0.000	0.000	New Alignment
1469	73520	283.489	0.000	2593.470	0.000	0.000	0.000	New Alignment
1470	73530	329.533	0.000	3065.110	0.000	0.000	0.000	New Alignment
1471	73540	298.906	0.000	3142.195	0.000	0.000	0.000	New Alignment
1472	73550	232.179	0.000	2655.425	0.000	0.000	0.000	New Alignment
1473	73560	179.805	0.000	2059.920	0.000	0.000	0.000	New Alignment
1474	73570	138.739	0.000	1592.720	0.000	0.000	0.000	New Alignment
1475	73580	115.703	0.000	1272.210	0.000	0.000	0.000	New Alignment
1476	73590	49.373	0.026	825.380	0.130	0.000	0.130	New Alignment
1477	73600	10.702	0.489	300.375	2.575	0.000	2.575	New Alignment
1478	73610	59.488	0.000	350.950	2.445	0.000	2.445	New Alignment
1479	73620	85.903	0.000	726.955	0.000	0.000	0.000	New Alignment
1480	73630	73.467	0.000	796.850	0.000	0.000	0.000	New Alignment
1481	73640	8.651	4.737	410.590	23.685	0.000	23.685	New Alignment
1482	73650	45.761	0.000	272.060	23.685	0.000	23.685	New Alignment
1483	73660	34.157	0.465	399.590	2.325	0.000	2.325	New Alignment
1484	73670	26.541	0.616	303.490	5.405	0.000	5.405	New Alignment
1485	73680	40.842	5.406	336.915	30.110	0.000	30.110	New Alignment
1486	73690	105.326	0.000	730.840	27.030	0.000	27.030	New Alignment
1487	73700	125.765	0.000	1155.455	0.000	0.000	0.000	New Alignment
1488	73710	129.781	0.000	1277.730	0.000	0.000	0.000	New Alignment
1489	73720	110.088	0.000	1199.345	0.000	0.000	0.000	New Alignment
1490	73730	76.511	0.172	932.995	0.860	0.000	0.860	New Alignment
1491	73740	57.989	2.014	672.500	10.930	0.000	10.930	New Alignment
1492	73750	61.715	0.207	598.520	11.105	0.000	11.105	New Alignment
1493	73760	103.428	0.000	825.715	1.035	0.000	1.035	New Alignment
1494	73770	119.885	0.000	1116.565	0.000	0.000	0.000	New Alignment
1495	73780	103.612	0.000	1117.485	0.000	0.000	0.000	New Alignment
1496	73790	79.293	0.000	914.525	0.000	0.000	0.000	New Alignment
1497	73800	67.341	0.000	733.170	0.000	0.000	0.000	New Alignment
1498	73810	57.761	0.000	625.510	0.000	0.000	0.000	New Alignment
1499	73820	54.303	0.000	560.320	0.000	0.000	0.000	New Alignment
1500	73830	47.471	0.000	508.870	0.000	0.000	0.000	New Alignment
1501	73840	55.706	0.000	515.885	0.000	0.000	0.000	New Alignment
1502	73850	62.898	0.000	593.020	0.000	0.000	0.000	New Alignment
1503	73860	73.502	0.000	682.000	0.000	0.000	0.000	New Alignment
1504	73870	78.618	0.000	760.600	0.000	0.000	0.000	New Alignment
1505	73880	70.937	0.000	747.775	0.000	0.000	0.000	New Alignment
1506	73890	67.138	0.000	690.375	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
1507	73900	63.457	0.000	652.975	0.000	0.000	0.000	New Alignment
1508	73910	39.910	0.000	516.835	0.000	0.000	0.000	New Alignment
1509	73920	32.853	0.000	363.815	0.000	0.000	0.000	New Alignment
1510	73930	30.251	0.000	315.520	0.000	0.000	0.000	New Alignment
1511	73940	35.157	0.000	327.040	0.000	0.000	0.000	New Alignment
1512	73950	52.620	0.000	438.885	0.000	0.000	0.000	New Alignment
1513	73960	70.574	0.000	615.970	0.000	0.000	0.000	New Alignment
1514	73970	63.368	0.000	669.710	0.000	0.000	0.000	New Alignment
1515	73980	68.298	0.000	658.330	0.000	0.000	0.000	New Alignment
1516	73990	93.476	0.000	808.870	0.000	0.000	0.000	New Alignment
1517	74000	110.086	0.000	1017.810	0.000	0.000	0.000	New Alignment
1518	74010	115.625	0.000	1128.555	0.000	0.000	0.000	New Alignment
1519	74020	100.693	0.000	1081.590	0.000	0.000	0.000	New Alignment
1520	74030	72.891	0.000	867.920	0.000	0.000	0.000	New Alignment
1521	74040	60.081	0.000	664.860	0.000	0.000	0.000	New Alignment
1522	74050	25.965	0.204	430.230	1.020	0.000	1.020	New Alignment
1523	74060	26.423	2.325	261.940	12.645	0.000	12.645	New Alignment
1524	74070	41.965	0.000	341.940	11.625	0.000	11.625	New Alignment
1525	74080	42.803	0.000	423.840	0.000	0.000	0.000	New Alignment
1526	74090	40.732	0.001	417.675	0.005	0.000	0.005	New Alignment
1527	74100	35.852	0.039	382.920	0.200	0.000	0.200	New Alignment
1528	74110	46.575	0.000	412.135	0.195	0.000	0.195	New Alignment
1529	74120	48.128	0.000	473.515	0.000	0.000	0.000	New Alignment
1530	74130	46.845	0.189	474.865	0.945	0.000	0.945	New Alignment
1531	74140	39.645	0.747	432.450	4.680	0.000	4.680	New Alignment
1532	74150	26.969	1.110	333.070	9.285	0.000	9.285	New Alignment
1533	74160	18.841	3.948	229.050	25.290	0.000	25.290	New Alignment
1534	74170	8.623	10.438	137.320	71.930	19.430	52.500	New Alignment
1535	74180	0.000	34.694	43.115	225.660	173.160	52.500	New Alignment
1536	74190	0.928	32.789	4.640	337.415	284.915	52.500	New Alignment
1537	74200	0.416	31.403	6.720	320.960	268.460	52.500	New Alignment
1538	74210	0.000	32.120	2.080	317.615	265.115	52.500	New Alignment
1539	74220	0.000	28.923	0.000	305.215	252.715	52.500	New Alignment
1540	74230	0.000	23.645	0.000	262.840	210.340	52.500	New Alignment
1541	74240	0.000	26.781	0.000	252.130	199.630	52.500	New Alignment
1542	74250	2.012	17.124	10.060	219.525	167.025	52.500	New Alignment
1543	74260	34.415	0.547	182.135	88.355	35.855	52.500	New Alignment
1544	74270	25.951	0.567	301.830	5.570	0.000	5.570	New Alignment
1545	74280	9.545	5.983	177.480	32.750	0.000	32.750	New Alignment
1546	74290	0.000	28.748	47.725	173.655	121.155	52.500	New Alignment
1547	74300	0.000	85.674	0.000	572.110	519.610	52.500	New Alignment
1548	74310	0.000	87.448	0.000	0.000	0.000	0.000	BR
1549	74320	0.000	100.440	0.000	0.000	0.000	0.000	BR
1550	74330	0.000	119.768	0.000	0.000	0.000	0.000	BR
1551	74340	0.000	170.228	0.000	0.000	0.000	0.000	BR
1552	74350	0.000	273.471	0.000	0.000	0.000	0.000	BR
1553	74360	0.000	294.968	0.000	0.000	0.000	0.000	BR
1554	74370	0.000	259.601	0.000	0.000	0.000	0.000	BR
1555	74380	0.000	240.051	0.000	0.000	0.000	0.000	BR
1556	74390	0.037	153.469	0.185	0.000	0.000	0.000	BR
1557	74400	13.508	17.166	67.725	0.000	0.000	0.000	BR
1558	74410	201.563	0.000	1075.355	85.830	33.330	52.500	New Alignment
1559	74420	319.940	0.000	2607.515	0.000	0.000	0.000	New Alignment
1560	74430	444.956	0.000	3824.480	0.000	0.000	0.000	New Alignment
1561	74440	468.321	0.000	4566.385	0.000	0.000	0.000	New Alignment
1562	74450	439.970	0.000	4541.455	0.000	0.000	0.000	New Alignment

Sr.No.	Chainage in m	Area Cut (m2)	Area Fill (m2)	Volume Cut (m3)	Volume Fill (m3)	Embankment filling (m3)	Subgrade filling (m3)	Remarks
1563	74460	383.148	0.000	4115.590	0.000	0.000	0.000	New Alignment
1564	74470	351.600	0.000	3673.740	0.000	0.000	0.000	New Alignment
1565	74480	287.880	0.000	3197.400	0.000	0.000	0.000	New Alignment
1566	74490	226.525	0.000	2572.025	0.000	0.000	0.000	New Alignment
1567	74500	160.715	0.000	1936.200	0.000	0.000	0.000	New Alignment
1568	74510	94.292	0.120	1275.035	0.600	0.000	0.600	New Alignment
1569	74520	61.843	0.007	780.675	0.635	0.000	0.635	New Alignment
1570	74530	33.273	0.863	475.580	4.350	0.000	4.350	New Alignment
1571	74540	19.678	6.281	264.755	35.720	0.000	35.720	New Alignment
1572	74550	9.729	15.989	147.035	111.350	58.850	52.500	New Alignment
1573	74560	1.804	17.141	57.665	165.650	113.150	52.500	New Alignment
1574	74570	0.150	24.936	9.770	210.385	157.885	52.500	New Alignment
1575	74580	0.022	27.753	0.860	263.445	210.945	52.500	New Alignment
1576	74590	0.000	31.349	0.110	295.510	243.010	52.500	New Alignment
1577	74600	0.000	35.109	0.000	332.290	279.790	52.500	New Alignment
1578	74610	0.000	40.964	0.000	380.365	327.865	52.500	New Alignment
1579	74620	0.000	43.358	0.000	421.610	369.110	52.500	New Alignment
1580	74630	0.000	37.132	0.000	402.450	349.950	52.500	New Alignment
1581	74640	0.653	28.545	3.265	328.385	275.885	52.500	New Alignment
1582	74650	1.865	16.465	12.590	225.050	172.550	52.500	New Alignment
1583	74660	8.763	4.697	53.140	105.810	53.310	52.500	New Alignment
1584	74670	0.000	46.185	43.815	254.410	201.910	52.500	New Alignment
1585	74680	0.000	154.881	0.000	1005.330	952.830	52.500	New Alignment
1586	74690	0.000	156.526	0.000	1557.035	1504.535	52.500	New Alignment
1587	74700	0.158	7.829	0.790	821.775	769.275	52.500	New Alignment
1588	74710	86.000	0.000	430.790	39.145	0.000	39.145	New Alignment
1589	74720	80.465	0.000	832.325	0.000	0.000	0.000	New Alignment
1590	74730	72.678	0.000	765.715	0.000	0.000	0.000	New Alignment
1591	74740	60.858	0.000	667.680	0.000	0.000	0.000	New Alignment
1592	74750	72.731	0.000	667.945	0.000	0.000	0.000	New Alignment
1593	74760	99.865	0.000	862.980	0.000	0.000	0.000	New Alignment
1594	74770	126.257	0.000	1130.610	0.000	0.000	0.000	New Alignment
1595	74780	121.485	0.000	1238.710	0.000	0.000	0.000	New Alignment
1596	74790	106.703	0.000	1140.940	0.000	0.000	0.000	New Alignment
1597	74800	113.838	0.000	1102.705	0.000	0.000	0.000	New Alignment
1598	74810	76.316	0.000	950.770	0.000	0.000	0.000	New Alignment
1599	74820	32.729	1.507	545.225	7.535	0.000	7.535	New Alignment
1600	74830	102.913	0.000	678.210	7.535	0.000	7.535	New Alignment
1601	74840	107.703	0.000	1053.080	0.000	0.000	0.000	New Alignment
1602	74850	106.079	0.000	1068.910	0.000	0.000	0.000	New Alignment
1603	74860	109.991	0.000	1080.350	0.000	0.000	0.000	New Alignment
1604	74870	126.078	0.000	1180.345	0.000	0.000	0.000	New Alignment
1605	74880	142.410	0.000	1342.440	0.000	0.000	0.000	New Alignment
1606	74890	152.492	0.000	1474.510	0.000	0.000	0.000	New Alignment
1607	74900	149.223	0.000	1508.575	0.000	0.000	0.000	New Alignment
1608	74910	144.534	0.000	1468.785	0.000	0.000	0.000	New Alignment
1609	74920	128.777	0.000	1366.555	0.000	0.000	0.000	New Alignment
1610	74930	105.995	0.000	1173.860	0.000	0.000	0.000	New Alignment
1611	74940	77.518	0.000	917.565	0.000	0.000	0.000	New Alignment
1612	74950	78.523	0.000	780.205	0.000	0.000	0.000	New Alignment
1613	74960	92.754	0.000	856.385	0.000	0.000	0.000	New Alignment
1614	74970	93.471	0.000	931.125	0.000	0.000	0.000	New Alignment
1615	74980	90.216	0.000	918.435	0.000	0.000	0.000	New Alignment
1616	74990	71.639	0.000	809.275	0.000	0.000	0.000	New Alignment
1617	75000	15.243	3.214	434.410	16.070	0.000	16.070	New Alignment
			Total =	**2000142.3**	**66920.4**	**51337.4**	**15582.9**	

DETAIL ESTIMATE FOR CONSTRUCTION OF PUBLIC TOILET

Sl. No	SOR 12	Description	Nos	Length (m)	Breadth (m)	Depth (m)	Qnty	Unit	Rate (`)	Amount (`)
1	2	3	4	5	6	7	8	9	10	11
		Earth Work								
1	3.2.1	Excavation in soil in hilly area by manual means including cutting and trimming of side slopes and disposing of excavated earth with all lifts and lead upto 50 meters.								
		Ordinary soil								
		Foundation	6	1.00	1.00	1.00	**6.00**	**cum**	152.31	152.31
2	5.2	Filling with available excavated earth in trenches, plinth and side of foundation in building works with layers not exceeding 20cm in depth including consolidation of each layer by ramming, watering etc, all complete.								
		Foundation	6	1.00	1.00	1.00	**4.00**	**cum**	68.44	**273.76**
		PCC Works								
3	7.1.5	Providing and laying cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size) excluding cost of centering in - All work upto plinth level								
		Foundation	6	0.90	0.90	0.10	0.49			
		Ground floor	1	4.10	2.00	0.10	0.82			
						Total	**1.31**	**cum**	**3821.97**	**4991.49**
		RCC Works								
4	8.1.1	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering,finishing and reinforcement in -(b) 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size)								
	(a)	All work upto foundation & plinth level :								
		1) Footing	6	0.90	0.90	0.20	0.97			
		2) Column upto plinth level	6	0.20	0.20	0.80	0.19			
		3) Plinth Beam,	2	1.75	0.20	0.20	0.14			
			2	2.15	0.20	0.20	0.17			
			3	1.80	0.20	0.20	0.22			
							1.692	**cum**	7271.05	**12302.62**
5	8.1.1	Reinforcement Cement Concrete work in walls including attached pillasters,columns,pillers,posts,piers,abutments,return walls,retaining walls,struts, buttresses,string or lacing courses,fillets etc. upto floor five level excluding cost of centering shuttering etc. complete.-1:2:4(1 cement : 2 course sand : 4 graded stone aggregate 20mm nominal size)								
		1) Column upto roof	3	2.60	0.20	0.20	0.31			
			3	2.30	0.20	0.20	0.28			
							0.59	**cum**	7271.05	**4275.38**
6	8.1.1	Beams, suspended floors, roofs having slope upto 15° landings, balconies, shelves, chajjas, lintels, bands, window sills, stair cases, spiral stair cases, cantilevers upto floor two level or floor two below from the ground floor (as indicated in the drawing).								
		Beam supporting the roof								
			2	1.75	0.20	0.20	0.14			
			2	2.15	0.20	0.20	0.17			
			3	1.80	0.20	0.20	0.22			
		Cantilever Beam	10	0.40	0.20	0.20	0.16			
		Roof slab	1	4.70	1.63	0.10	0.77			
			2	4.70	0.50	0.10	0.47			
							1.92	**cum**	7271.05	**13983.39**
7	**18.2**	Supplying, bending and placing in position tor- steel reinforcement in all R.C.C works including cost of binding wires, all complete.								

Sl. No	SOR 12	Description	Nos	Length (m)	Breadth (m)	Depth (m)	Qnty	Unit	Rate (`)	Amount (`)
1	2	3	4	5	6	7	8	9	10	11
		(f) Thermo-Mechanically Treated Bars								
		Footings @0.6% of concrete					45.78			
		Columns @1.2% of concrete					73.48			
		Beams @ 1% Concrete					141.30			
		Roof Slab @0.8% Concrete					77.57			
							338.13	**Kg**	**67.28**	**22750.08**
8	14.1	Centering and shuttering including strutting,propping etd. And removal of form for:								
		(a)Foundations, footings, bases of columns , etc for mass concrete	**n**	**L**	**B**	**t**				
		Foundation,Area= n*(2L+2B)*t	6	0.90	0.90	0.20	4.32			
			n	**L**	**b**	**d**				
		Column Area=n*L*(2b+2d)	6	0.80	0.20	0.20	3.84			
						Total	**8.16**	**Sqm**	429.4	**3503.90**
		(c)Columns,piers,pillars,abutment,posts and struts etc								
		Columns ,Area=n*L*(2b+2d)	3	2.60	0.20	0.20	6.24			
			3	2.30	0.20	0.20	5.52			
						Total	**11.76**	**Sqm**	568	**6679.68**
		(d)Lintels,beams,plinth beams, girders, bressumers and cantilevers , etc								
		Area=n*L(b+2d)	**n**	**L**	**b**	**d**				
		Plinth Beam	2	2.15	0.20	0.20	2.58			
			3	1.80	0.20	0.20	3.24			
			2	1.75	0.20	0.20	2.10			
		Beam supporting the roof	2	2.15	0.20	0.20	2.58			
			3	1.80	0.20	0.20	3.24			
		Cantilever Beam	10	0.40	0.20	0.20	2.40			
						Total	**16.14**	**Sqm**	415.46	**6705.52**
		(e)Suspended floors, roofs, landings, shelves and their support, balconies and chajjaj,etc.								
		Roof Slab	1	4.70	1.628		7.65			
			2	4.70	0.50		4.70			
							12.35	**Sqm**	630.75	**7790.77**
9	10.1	Providing and laying first class brick work in half brick thick in superstructure of standard size bricks with 1:4 cement mortar (1 cement and 4 course sand) including carriage of bricks up to work site, curing etc all complete.								
		Outter Wall	1	1.55	2.30		3.57			
			1	1.95	2.30		4.49			
			1	1.55	2.00		3.10			
			1	1.95	2.00		3.90			
			1	1.00	2.000		2.00			

Sl. No	SOR 12	Description	Nos	Length (m)	Breadth (m)	Depth (m)	Qnty	Unit	Rate (`)	Amount (`)
1	2	3	4	5	6	7	8	9	10	11
			1	0.40	2.000		0.80			
			1	0.19	1.00	x0.5	0.09			
			1	0.06	0.40	x0.5	0.01			
						(A)Total	**17.96**	**Sqm**		
		Inner wall	1	1.60	2.000		3.20			
			1	0.30	1.70	x0.5	0.26			
			1	0.15	2.000		0.30			
			1	0.35	2.000		0.70			
			1	0.10	2.000		0.20			
			1	1.10	2.000		2.20			
			1	0.11	2.000	x0.5	0.11			
						(B)Total	**6.97**			
		Deduct for opening, Ventilator	2	0.75	0.30		0.45			
			1	1.55	0.50		0.78			
			1	1.95	0.80		1.56			
			1	0.80	0.50		0.40			
						(C)Total	**3.19**			
				Net Total=(A+B-C)			**21.736**	**Sqm**	639.14	**13892.35**
10	9.1.1	12mm cement plaster 1:3(1cement : 3 fine sand).								
		Internal Wall								
		Ladies Toilet	6	1.00	2.00		12.00			
			2	0.17	1.00	x0.5	0.17			
			2	1.00	2.17		4.33			
			2	2.20	2.17		9.53			
			1	0.70	2.19		1.53			
			1	0.17	0.70	x0.5	0.06			
		Mens Toilet	1	0.80	2.30		1.84			
			1	0.50	2.30		1.15			
			1	1.10	2.15		2.60			
			2	0.80	2.17		3.47			
			1	0.80	0.13	x0.5	0.05			
			1	1.00	2.15		2.15			
			1	0.90	2.17		1.95			
			1	0.90	2.00		1.80			
			1	0.90	0.17	x0.5	0.08			
			2	0.80	1.50		2.40			
			4	0.50	1.50		3.00			
						Total(A)	**48.10**			
		Deduction for opening	2	0.75	1.80		2.70			
			2	0.75	0.30		0.45			
			1	0.80	1.95		1.56			
			1	0.80	0.50		0.40			
			1	0.50	1.55		0.78			
			1	0.60	1.80		1.08			
						Total(B)	**6.97**			
					Net Total(C)		**41.14**	**Sqm**	132.3	**5442.42**

Sl. No	SOR 12	Description	Nos	Length (m)	Breadth (m)	Depth (m)	Qnty	Unit	Rate (`)	Amount (`)
1	2	3	4	5	6	7	8	9	10	11
11	9.2.1	15mm cement plaster 1 : 3 (1 cement : 3 fine sand).								
		External Wall	1	4.10	2.00		8.20			
			1	4.10	2.30		9.43			
			1	1.20	2.00		2.40			
			1	0.19	1.20	x0.5	0.11			
			1	0.60	1.50		0.90			
						Total	**21.04**			
		Deduction for opening	2	0.75	0.30		0.45			
			1	0.80	1.95		1.56			
			1	0.80	0.5		0.40			
			1	0.50	1.55		0.78			
						Total	**3.19**			
					Net Total(C)		**17.86**	**Sqm**	155.13	**2770.28**
12	9.1.1	12mm cement plaster to ceiling 1 : 3 (1 cement : 3 fine sand)								
			1	4.70	1.63		7.65			
			2	4.70	0.40		3.76			
						Total	**11.41**	**Sqm**	132.3	**1509.75**
13		Applying one coat of cement primer of approved brand and manufacture on wall surface.								
		Internal Wall					41.14			
		External Wall					21.04			
		Ceiling					11.41			
						Total	**73.59**	**Sqm**	**53.80**	**3959.22**
14		Finishing walls with water proofing cement paint of approved brand and manufacture and of required shade on new work (three or more coats) to give an even shade.								
		External,Internal Wall and ceiling					**73.59**	**Sqm**	**93.00**	**6844.00**
15		Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with PVC/ neoprene gasket etc. complete as per the architectural drawings and the directions of engineer-in-charge . (Cost of aluminium snap beading shall be paid in basic item) :								
		(a)With glass panes of 4.0 mm thickness (weight not less than 10.0 kg/ sqm)								
		Ventilator	2	0.75	0.30		0.45			
						Total	**0.45**	**Sqm**	**1311.30**	**590.09**
16		Providing and fixing PVC rigid foam sheet 1mm thick manufactured by M/s Rajshri or equivalent on existing door shutters (bathroom and W.C. doors) using synthetic rubber based adhesive (Fevicol SR 998 or equivalent).								
		Door	2	0.75		1.80	2.70			
			1	0.60		1.80	1.08			
						Total	**3.78**	**Sqm**	**746.20**	**2820.64**
17		Providing and fixing M.S. sliding door bolts (aldrops) bright finished and/ or black enamelled with nuts and screws etc. complete.								
		(a)250 x 16 mm	6			**Total**		**No**	**146.80**	**880.80**
18		Providing and fixing M.S. pressed butt hinges bright finished with necessary screws, etc. complete.								
		(d)100 x 58 x 1.90 mm (Medium type)	6			**Total**		**No**	**61.90**	**371.40**

Sl. No	SOR 12	Description	Nos	Length (m)	Breadth (m)	Depth (m)	Qnty	Unit	Rate (`)	Amount (`)
1	2	3	4	5	6	7	8	9	10	11
19		Providing and fixing vitreous china Urinal Corner 44 x 35 x 27.5cm of Parryware/ Hindware/ Cera and equivalent make with flush valve/spray with C.I or R.S brackets standard size of G.I flush pipe and C.P brass spreaders with brass unions and G.I clamps complete including painting of fittings and brackets, cutting and making good the walls and floors wherever required.								
		Gents								
		ii) Pastel	2					**No**	**7738.00**	**15476.00**
20		Providing and fixing white vitreous china squatting plate urinal with integral rim, longitudinal flush pipe.								
		Ladies	1					**No**	**2465.20**	**2465.20**
21		Providing and fixing P.V.C. low level flushing cistern with manually controlled device (handle lever) conforming to IS: 7231, with all fittings and fixtures complete.								
		(a) 10 litre capacity-White	2					**No**	**1536.50**	**3073.00**
							TOTAL		**=**	**140683.4**
		ADD 8.5% FOR INTERNAL AND EXTERNAL WATER PIPE							**=**	**11958.09**
		GRAND TOTAL							**=**	**152641.5**

152600.0

WPI 2012 to 2020 Mar 184798.6

(Rupees one lakh eighty four thousand seven hundred ninety eight and paise sixty) only.

DETAIL ESTIMATE FOR CONSTRUCTION OF BUS SHED

Sl. no	Sor 13	Decription	Nos	Length (m)	Breadth (m)	Depth (m)	Qnty	Unit	Rate (Rs.)	Amount (Rs.)
			3	4	5	6	7	8	9	10.00
1	3.2.1	Excavation in soil in hilly area by manual means including cutting and trimming of side slopes and disposing of excavated earth with all lifts and lead upto 50 meters.								
		Ordinary Soil								
			4	1.00	1.00	1.00	4	**cum**	152.31	**609.24**
2	5.2	Filling with available excavated earth in trenches, plinth and side of foundation in building works with layers not exceeding 20cm in depth including consolidation of each layer by ramming, watering etc, all complete.								
		Foundation		2/3x4			2.666667	cum	68.44	**182.51**
3	7.1.5	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:								
		(a)1:3:6(1 cement :3 course sand :6 stone aggregate 20mm nominal size)								
		Foundation	4	1.0	1.0	0.1	0.4			
		GF	1	2.7	1.1	0.1	0.297			
						Total	**0.697**	**cum**	**3821.97**	**2663.91**
4	8.1.1	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering,finishing and reinforcement in -								
		All work upto plinth level :								
		(b)1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size)								
		Foundation	4	1.0	1.0	0.2	0.8			
		Column	4	0.2	0.2	0.8	0.128			
		Plinth beam	2	3.55	0.2	0.25	0.355			
			2	1.35	0.2	0.25	0.135			
						Total	**1.418**	**Cum**	7271.05	**10310.35**
5	8.1.1	Reinforcement Cement Concrete work in walls including attached pillasters,columns,pillers,posts,piers,abutments,return walls, retaining walls,struts,buttresses,string or lacing courses,fillets etc. upto floor five level excluding cost of centering shuttering etc. complete.-1:2:4(1 cement : 2 course sand : 4 graded stone aggregate 20mm nominal size)								
		Column Upto roof	2	2.5	0.2	0.2	0.2			
			2	2.3	0.2	0.2	0.184			
						Total	**0.384**	**Cum**	7271.05	**2792.08**
6	8.1.1	Beams, suspended floors, roofs having slope upto 15° landings, balconies, shelves, chajjas, lintels, bands, window sills, stair cases, spiral stair cases, cantilevers upto floor two level or floor two below from the ground floor (as indicated in the drawing).								
		Roof slab	1	4.35	2.023	0.1	0.880			
		Chajja	1	4.35	0.585	0.1	0.254			
		Beams	2	3.55	0.2	0.2	0.284			
			2	1.35	0.2	0.2	0.108			

Sl. no	Sor 13	Decription	Nos	Length (m)	Breadth (m)	Depth (m)	Qnty	Unit	Rate (Rs.)	Amount (Rs.)
			3	**4**	**5**	**6**	**7**	**8**	**9**	**10.00**
		Seat slab	1	3.75	1.55	0.1	0.581			
		Deduc tion	1	2.7	1.0	0.1	0.270			
						Total	**1.838**	**Cum**	7271.05	**13362.23**
7	**18.2**	Steel reinforcement for R.C.C work including straighthening, cutting, bending, placing in position and binding all complete.								
		(f) Thermo-Mechanically Treated Bars								
		Footing @0.6 of %concrete					37.68			
		Column @1.2% of concrete					48.23			
		Beams @1% of concrete					69.24			
		Roof Slab@0.8% of concrete					55.26			
		Seat slab@1% of conc rete					24.43			
		Chajja@0.2% of c oncrete					4.00			
						Total	**214.41**	**kg**	**67.28**	**14425.94**
8	10.1	Providing and laying first class brick work in half brick thick in superstructure of standard size bricks with 1:4 cement mortar (1 cement and 4 course sand) including carriage of bricks up to work site, curing etc all complete.								
		in cement moratar 1:3 (1 cement : 3 coarse sand)								
		External Wall	1	3.55		2.1	7.455			
			2	1.35		0.75	2.025			
			2	0.55		0.75	0.825			
						Total	**10.305**	**Sqm**	639.14	**6586.34**
		Internal Wall	1	3.1		0.75	2.325			
			2	1.2		0.75	1.8			
			1	2.7		0.3	0.81			
			2	1.0		0.3	0.6			
						Total	**5.535**	**Sqm**	639.14	**3537.64**
9	9.1.1	12mm cement plaster 1 : 3 (1 cement : 3 fine sand)								
		Internal wall	1	3.75		1.573	5.899			
			2	1.55		0.45	1.395			
			1	3.1		0.45	1.395			
			2	1.2		0.45	1.08			
			1	2.7		0.3	0.81			
			2	1.025		0.3	0.615			
			2	0.3		0.45	0.27			
			2	0.125		0.75	0.188			
						Total	**11.651**	**Sqm**	132.3	**1541.46**
10	9.2.1	with a floating coat of neat cement.								
		External Wall	1	4.35		2.3	10.005			
			2	1.75		2.3	8.05			
			2	0.2	x0.5	1.75	0.35			
			2	0.75		0.75	1.125			
		Chajja	1	4.35		0.585	2.545			

Sl. no	Sor 13	Decription	Nos	Length (m)	Breadth (m)	Depth (m)	Qnty	Unit	Rate (Rs.)	Amount (Rs.)
			3	**4**	**5**	**6**	**7**	**8**	**9**	**10.00**
						Total	**22.075**	**Sqm**	155.13	**3424.46**
11	9.1.1	12 mm cement plaster to ceiling 1 : 4(1 cement : 4 fine sand)								
		Ceiling	1	3.55	1.359		4.824			
			2	1.359	0.2		0.272			
		Chajja	1	4.35	0.505		2.197			
						Total	**7.293**	**Sqm**	132.3	**964.86**
12		Applying one coat of cement primer of approved brand and manufacture on wall surface.								
		Internal wall					5.899			
							1.395			
							0.615			
							0.27			
							0.188			
						Total	8.366			
		External Wall					22.075			
		Ceiling					7.293			
						Total	**8.366**	**Sqm**	**53.80**	**450.10**
									TOTAL	**58187.21**
									Say	**58190.00**
									WPI 2012 to 2020 Mar	**70468.1**

(Rupees seventy thousand four hundred sixty eight and paise nine) only.

DETAIL ESTIMATE FOR CONSTRUCTION OF BAZAR SHED

Sl. No	SOR No	Description	No	Length	Breadth	Height	Quantity	Unit	Rate	Amount
1	3.2.1	Excavation in soil in hilly area by manual means including cutting and trimming of side slopes and disposing of excavated earth with all lifts and lead upto 50 meters.								
		a) Ordinary soil.								
		Foundation	6	1.200	1.200	1.20	10.368			
						Total	**10.368**	**cum**	**218.10**	**2261.26**
2	7.1.5	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:								
		a) 1:3:6(1 cement :3 course sand :6 stone aggregate 20mm nominal size)								
		Footings	6	1.200	1.200	0.10	0.864			
		GF slab	1	4.850	2.450	0.10	1.188			
						Total	**2.052**	**cum**	**3821.97**	**7844.00**
3	5.2	Filling with available excavated earth in trenches, plinth and side of foundation in building works with layers not exceeding 20cm in depth including consolidation of each layer by ramming, watering etc, all complete.								
		Foundations	6	1.200	1.200	1.20	10.368			
						Total	**6.912**	**cum**	68.44	**473.00**
4	8.1.2	Providing and laying in position machine batched, machine mixed and machine vibrated design mix M-20 grade reinforced cement concrete excluding cost of centering and shuttering and reinforcement in -								
		a) All work upto plinth level.								
		Footings	6	1.100	1.100	0.2	1.452			
		column	6	1.000	0.250	0.25	0.375			
		Tie Beam	7	3.350	0.300	0.20	1.407			
		Roof Slab	2	4.280	4.260	0.10	3.647			
		Sitting area	1	7.250	3.650	0.10	2.646			
		Deduction	1	4.850	2.450	0.10	1.188			
						Total	**8.339**	**cum**	5495.67	**45826.00**
		(b)All work above plinth level upto V floor level								
		Roof Beam	4	4.180	0.250	0.200	0.836			
			3	4.260	0.250	0.2	0.639			
						Total	**1.475**	**cum**	5495.67	**8106.11**
5	8.1.2	Reinforced cement concrete work in walls including attached pillasters, columns, pillers, posts, piers, abutments, return walls, retaining walls, struts, buttresses, string or lacing courses, fillets etc. upto floor five level excluding cost of centering shuttering etc complete.								
	(a)	1:1.5:3 (*1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal*								
		Columns	4	3.000	0.25	0.25	0.750			
			2	3.580	0.25	0.25	0.448			
						Total	**1.198**	**cum**	5495.67	**6581.00**

Sl. No	SOR No	Description	No	Length	Breadth	Height	Quantity	Unit	Rate	Amount
6	14	Centering and shuttering including strutting,propping etd. And removal of form for:								
		a) Foundations, footings, bases of columns etc. for mass concrete.								
		Foundations	Area = n*(2L+2B)*t							
			n	L	B	t				
		Footings	6	1.100	1.100	0.20	5.280			
		Column	6	1.000	0.250	0.25	3.750			
						Total	**9.030**	**sq.m**	429.4	**3877.00**
		(c) Columns, pillars, piers, abutments, posts and struts.								
		Area =n*L*(2b+2d)	n	L	b	d				
		columns	4	3.000	0.250	0.25	12.000			
			2	3.580	0.250	0.25	7.160			
						Total	**19.160**	**sq.m**	568	**10883.00**
		d) Lintels, beams, plinth beams, girders, bressumers and cantilevers, etc.								
		Beams								
		Area = n*L*(b+2d)	n	L	b	d				
		Plinth Beam	7	3.350	0.200	0.30	18.760			
		Roof Beam	4	4.180	0.200	0.25	11.704			
			3	4.260	0.200	0.25	8.946			
						Total	**39.410**	**sq.m**	415.46	**16373.00**
7	**18.2**	Steel reinforcement for R.C.C work including straighthening, cutting, bending, placing in position and binding all complete.								
		(f) Thermo-Mechanically Treated Bars								
		Footings @0.6% of concrete					68.389			
		Columns @1.2% of concrete					148.130			
		Beams @ 1% Concrete					226.237			
		Roof Slab @0.8% Concrete					229.004			
		sitting area slab@1%concrete					114.453			
						Total	**786.213**	**kg**	**67.28**	**52898.75**
8	10.1	Providing and laying first class brick work in half brick thick in superstructure of standard size bricks with 1:4 cement mortar (1 cement and 4 course sand) including carriage of bricks up to work site, curing etc all complete.								
		External Walls								
			4	3.350		1.20	16.080			
			2	1.200		0.60	1.440			
		Internal Walls	2	2.450		0.70	3.430			
			1	4.850		0.70	3.395			
						Total	**24.345**	**sq.m**	639.14	**15559.86**
9	9.1.1	12mm cement plaster 1 : 3 (1 cement : 3 fine sand)								
		Internal Wall	4	3.550		1.20	17.040			
			2	1.200		0.60	1.440			
		Sitting area	2	2.450		0.60	2.940			
			1	4.850		0.60	2.910			

Sl. No	SOR No	Description	No	Length	Breadth	Height	Quantity	Unit	Rate	Amount
		slab	1	7.146		3.70	26.440			
		Deduction	1	4.850		2.45	11.883			
					Net Total		**38.888**	**sq.m**	132.3	**5144.84**
10	9.2.1	15mm cement plaster 1 : 3 (1 cement : 3 fine sand).								
		External Wall	2	3.850		1.300	10.010			
			2	1.200		0.700	1.680			
			1	7.200		1.200	8.640			
					Sub Total		**20.330**			
		columns	4	1.600	0.250	0.250	6.400			
			1	2.450	0.250	0.250	2.450			
			1	3.650	0.250	0.250	3.650			
		Beams	4	4.180	0.200	0.250	11.704			
			3	4.260	0.200	0.250	8.946			
					Sub Total		**33.150**			
						Total	**53.480**	**sq.m**	155.13	**8296.35**
11	9.1.1	12mm cement plaster 1 : 3 (1 cement : 3 fine sand)								
		Roof Slab	2	3.950	4.260		33.654			
		Deduction(Column area)								
			6	0.250	0.250		0.375			
						Total	**33.279**	**sq.m**	132.3	**4402.81**
12	**21.60**	Applying one coat of cement primer of approved brand and manufacture on wall surface.								
		External Wall					20.330			
		Internal Wall	4	3.550		0.600	8.520			
		Columns,Beams					33.150			
		ceiling					33.279			
						Total	**95.279**	**sq.m**	**53.80**	**5126.01**
							Total			**260316.31**
									Say	**260300.00**
									WPI 2012 to 2020 Mar	**315223.3**

(Rupees three lakh fifteen thousand two hundred twenty three and paise thirty) only.