

## Bill of Quantity for Special Repair of NH-06 from km 69+000 to km 150+000

( BASE ON SOR 2016 FOR NATIONAL HIGHWAYS IN MIZORAM)

Sl. No	Sor No	Description of items	Quantity	Unit	Rate ₹	Amount ₹
1	3.12	Scarifying Existing Granular Surface to a Depth of 50 mm by Manual Means (Scarifying the existing granular road surface to a depth of 50 mm and disposal of scarified material within all lifts and leads upto 1000 metres. )				
		Area as per Annex - I	1560.87	sqm	48.00	74922
2	4.8	Water Bound Macadam (Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.)				
		A. By Manual Means				
		(ii) Grading - 2 (53 mm to 22.4 mm)				
		(b) Using Screening Type-B (11.2mm Agg.)				
		Qty as per Annex - I	234.13	cum	4503.00	1054290
3	10.4	Filling Pot- holes and Patch Repairs with open - graded Premix surfacing, 20mm. (Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 511, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2)				
		Qty as per Annex - II	1560.87	sqm	377.00	588448
4		Construction of Retaining wall Type-I at km 73.200, 75.250, 76.850, 77.250, 86.200, 88.500, 90.150	70.00	m	36954.10	2586787
5		Construction of Retaining wall of 3.0 m height and 10.0 m length as per IRC SP-48-1998 at km 129.800, 117.700, 120.400, 131.000, 136.500 as per Analysis at Enclosure-I	60	m	58116	3486960
6	10.14	<b>Hill Side Drain Clearance</b> (Removal of earth from the choked hill side drain and disposing it on the valley side manually) from km 69.0 to km 92.300 & km 105.950 to km 150.00  This item shall be only executed upon instruction from Engineer at specified locations on need basis - Lumpsum quantity considered	40000	m	68	2720000
7	P&M-014	Hiring of Dozer D - 80 - A 12  This item shall be only executed upon instruction from Engineer at specified locations on need basis - Lumpsum quantity considered	200	Hour	5700	1140000

Sl. No	Sor No	Description of items	Quantity	Unit	Rate ₹	Amount ₹	
8	10.12	Land Slide Clearance in soil (Clearance of land slides in soil and ordinary rock by a bull-dozer D 80 A-12, 180 HP and disposal of the same on the valley side) This item shall be only executed upon instruction from Engineer at specified locations on need basis - Lumpsum quantity considered	5000.00	cum	52	260000	
<b>A</b>		<b>Sub-Total:</b>				<b>11911407</b>	
9	1.1	<b>Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum.</b> (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)					
		<b>Aggregates/sand</b>					
			426.68	cum	219.00	93443	
10	1.3	Loading and Unloading of Cement or Steel by Manual Means and stacking.					
		cement	2.11	ton	376.00	793	
11	1.4	Loading and Unloading of Bitumen by Manual Means					
		Bitumen	7.70	ton	160.00	1232	
12	1.6	Cost of Haulage Excluding Loading and Unloading					
		(i) Surfaced Road					
		Carriage of Stone aggregate from Chawngtlai quarry					
		Lead =as per Annex-III=					
			45				
		Hence Rate =13.2*45					
			594				
		Qty as per Annex - II =					
			633.51	633.51	t/km	594.00	376305
13	1.6	Cost of Haulage Excluding Loading and Unloading					
		(i) Surfaced Road					
		Carriage of Sand from R.Tuipui					
		Lead =as per Annex-III=					
			10				
		Hence Rate =13.2*10					
			132				
		Qty as per Annex - II =					
			55.26	55.26	t/km	132.00	7294
14	1.7	Cost of Haulage Excluding Loading and Unloading					
		(ii) Surface Road					
		Carriage of Cement & Bitumen from Aizawl					
		Lead =as per Annex-III=					
			152				
		Hence Rate =11.3*152					
			1717.6				
		Qty as per Annex - II =					
			9.81	9.81	t/km	1717.60	16858
<b>B</b>		<b>Sub-Total:</b>				<b>495925</b>	
<b>C</b>		<b>Total</b>				<b>12407332</b>	
<b>D</b>		<b>Adjustment of VAT on C</b>				<b>1,17,05,030</b>	
<b>E</b>		<b>GST (12% on D)</b>				<b>14,04,604</b>	
<b>F</b>		<b>Grand Total (D+E)</b>				<b>1,31,09,634</b>	

## Quantity Calculation for Special Repair of NH-06 from km 69+000 to km 150+000

( BASE ON SOR 2016 FOR NATIONAL HIGHWAYS IN MIZORAM)

Sl. No	Sor No	Description of items	No	Length	Width	Height	Quantity	Unit
1	3.12	Scarifying Existing Granular Surface to a Depth of 50 mm by Manual Means (Scarifying the existing granular road surface to a depth of 50 mm and disposal of scarified material within all lifts and leads upto 1000 metres. )						
		Area as per Annex - I					1560.87	sqm
2	4.8	Water Bound Macadam (Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.)						
		A. By Manual Means						
		(ii) Grading - 2 (53 mm to 22.4 mm)						
		(b) Using Screening Type-B (11.2mm Agg.)						
		Qty as per Annex - I		1560.87		0.15	234.13	cum
3	10.4	Filling Pot- holes and Patch Repairs with open - graded Premix surfacing, 20mm. (Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 511, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2)						
		Qty as per Annex - II					1560.87	sqm
4		Construction of Retaining wall Type-I at km 73.200, 75.250, 76.850, 77.250, 86.200, 88.500, 90.150	7	10.00		3	70.00	m
5		Construction of Retaining wall of 3.0 m height and 10.0 m length as per IRC SP-48-1998 at km 129.800, 117.700, 120.400, 131.000, 136.500 as per Analysis at Enclosure-I	6	10		3	60	m
6	10.14	<b>Hill Side Drain Clearance</b> (Removal of earth from the choked hill side drain and disposing it on the valley side manually) from km 69.0 to km 92.300 & km 105.950 to km 150.00  This item shall be only executed upon instruction from Engineer at specified locations on need basis - Lumpsum quantity considered		40000			40000	m
7	P&M-014	Hiring of Dozer D - 80 - A 12  This item shall be only executed upon instruction from Engineer at specified locations on need basis - Lumpsum quantity considered					200	Hour

Sl. No	Sor No	Description of items	No	Length	Width	Height	Quantity	Unit
8	10.12	Land Slide Clearance in soil (Clearance of land slides in soil and ordinary rock by a bull-dozer D 80 A-12, 180 HP and disposal of the same on the valley side) This item shall be only executed upon instruction from Engineer at specified locations on need basis - Lumpsum quantity considered					5000	cum
9	1.1	<b>Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum.</b> (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						
		<b>Aggregates/sand</b>					426.68	cum
10	1.3	Loading and Unloading of Cement or Steel by Manual Means and stacking. cement					2.11	ton
11	1.4	Loading and Unloading of Bitumen by Manual Means Bitumen					7.70	ton
12	1.6	Cost of Haulage Excluding Loading and Unloading (i) Surfaced Road Carriage of Stone aggregate from Chawngtlai quarry Lead =as per Annex-III= 45 km Hence Rate =13.2*45 594 Qty as per Annex - II = 633.51 ton					633.51	t/km
13	1.6	Cost of Haulage Excluding Loading and Unloading (i) Surfaced Road Carriage of Sand from R.Tuipui Lead =as per Annex-III= 10 km Hence Rate =13.2*10 132 Qty as per Annex - II = 55.26 ton					55.26	t/km
14	1.7	Cost of Haulage Excluding Loading and Unloading (ii) Surface Road Carriage of Cement & Bitumen from Aizawl Lead =as per Annex-III= 152 km Hence Rate =11.3*152 1717.6 Qty as per Annex - II = 9.81 ton					9.81	t/km

Name of work : Patch Repair on NH-6 (SH: Patch repair between ch: 69/00 kmp to ch: 110/00 kmp)

QUANTITY CALCULATION

Description	Requirement for	Aggregates	Stone Chip	Sand	Cement	Bitumen	Quantity	unit	Aggregate s (m <sup>3</sup> )	Stone chip (m <sup>3</sup> )	Sand	Cement	Bitumen tonne
1	2	4	5	6	7	8	9	10	12	13	14	15	16
WBM Gr-II	360.00 m <sup>3</sup>	435.60 m <sup>3</sup>	115.20 m <sup>3</sup>				234.13	m <sup>3</sup>	283.30	74.92			
Prime Coat	3500.00 m <sup>2</sup>					4.900 ton	1560.87	m <sup>2</sup>					2.19
Pre-mix Carpet	191.00 m <sup>3</sup>		156.75 m <sup>3</sup>	122.5 m <sup>3</sup>	8.62 t	22.5 ton	46.83	m <sup>3</sup>	0.00	38.43	30.03	2.11	5.52
<b>Total requirement of Materials :</b>									<b>283.30</b>	<b>113.35</b>	<b>30.03</b>	<b>2.11</b>	<b>7.70</b>
<b>Ton / unit quantity :</b>									<b>1.54</b>	<b>1.74</b>	<b>1.84</b>		
<b>Total weight ( in ton ) :</b>									<b>436.28</b>	<b>197.23</b>	<b>55.26</b>	<b>2.11</b>	<b>7.70</b>

### Measurement Sheet of Potholes

Sl.No	Chainages			No	Length	Width	Area sqm	Thickness	Volume cum
1	81.00	to	82.00	1	2.00	1.00	2.00	0.15	0.30
				1	2.50	2.00	5.00	0.15	0.75
				1	3.00	2.00	6.00	0.15	0.90
				1	2.00	1.50	3.00	0.15	0.45
				1	2.00	1.40	2.80	0.15	0.42
2	82.00	to	83.00	1	3.00	1.20	3.60	0.15	0.54
				1	4.50	1.00	4.50	0.15	0.68
3	83.00	to	84.00	1	2.50	1.00	2.50	0.15	0.38
				1	2.00	1.00	2.00	0.15	0.30
				1	2.00	1.50	3.00	0.15	0.45
				1	3.00	1.00	3.00	0.15	0.45
				1	4.00	3.00	12.00	0.15	1.80
				1	8.00	3.75	30.00	0.15	4.50
4	84.00	to	85.00	1	2.00	1.00	2.00	0.15	0.30
				1	1.50	1.00	1.50	0.15	0.23
				1	3.20	2.00	6.40	0.15	0.96
				1	2.00	1.00	2.00	0.15	0.30
5	85.00	to	86.00	1	1.35	1.00	1.35	0.15	0.20
				1	4.00	1.10	4.40	0.15	0.66
6	86.00	to	87.00	1	8.00	3.75	30.00	0.15	4.50
				1	5.00	2.00	10.00	0.15	1.50
				1	5.00	2.50	12.50	0.15	1.88
7	87.00	to	88.00	1	1.00	1.00	1.00	0.15	0.15
				1	4.00	1.30	5.20	0.15	0.78
				1	3.00	2.40	7.20	0.15	1.08
				1	15.00	3.00	45.00	0.15	6.75
				1	20.00	3.50	70.00	0.15	10.50
				1	12.00	1.50	18.00	0.15	2.70
8	88.00	to	89.00	1	8.50	2.20	18.70	0.15	2.81
				1	5.50	1.80	9.90	0.15	1.49
				1	6.00	2.20	13.20	0.15	1.98
				1	4.50	2.00	9.00	0.15	1.35
				1	2.60	2.00	5.20	0.15	0.78
				1	6.00	3.00	18.00	0.15	2.70
9	89.00	to	90.00	1	4.00	2.50	10.00	0.15	1.50
				1	3.00	2.00	6.00	0.15	0.90
				1	4.50	3.00	13.50	0.15	2.03
				1	6.00	3.00	18.00	0.15	2.70
				1	3.00	2.00	6.00	0.15	0.90
				1	2.60	1.60	4.16	0.15	0.62
				1	2.50	2.00	5.00	0.15	0.75
				1	3.00	1.50	4.50	0.15	0.68
				1	6.00	2.30	13.80	0.15	2.07
				1	7.00	2.00	14.00	0.15	2.10
10	90.00	to	91.00	1	2.60	1.50	3.90	0.15	0.59
				1	2.50	1.20	3.00	0.15	0.45
				1	1.60	1.00	1.60	0.15	0.24

### Measurement Sheet of Potholes

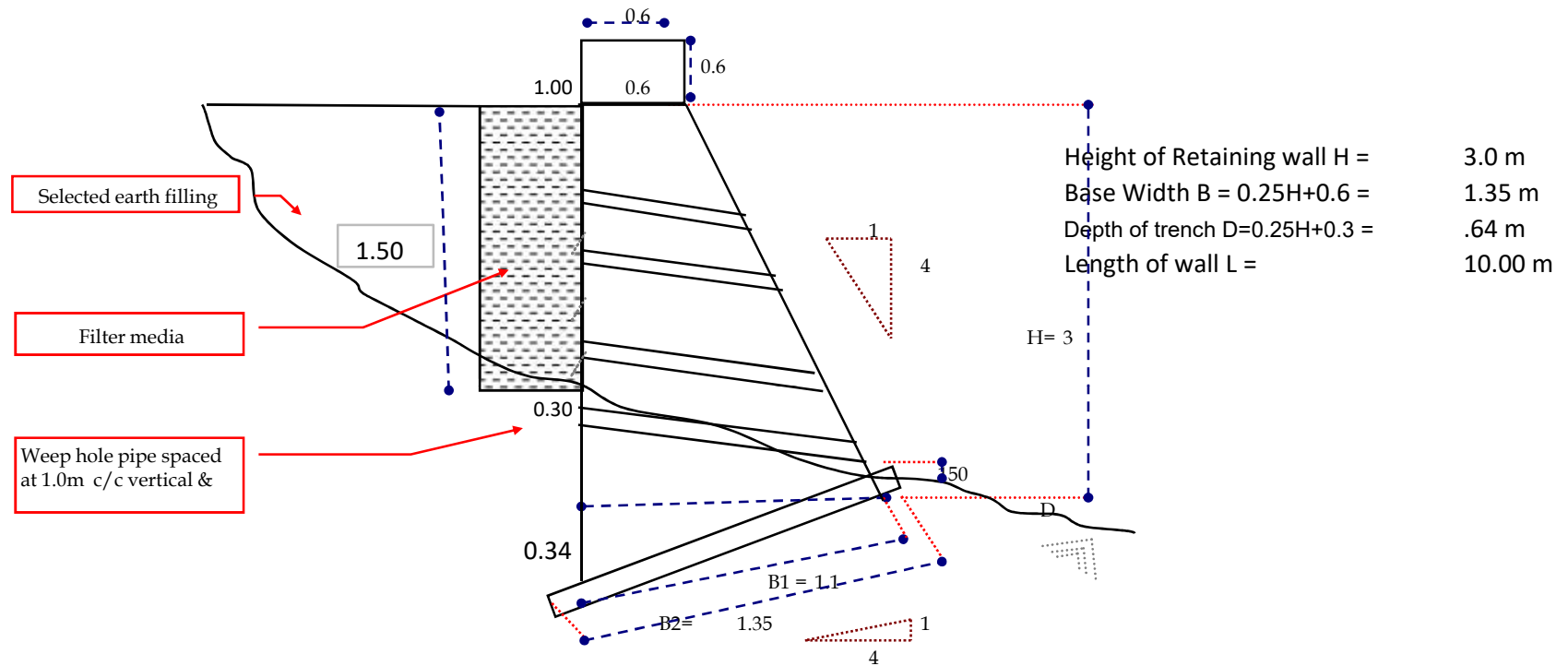
Sl.No	Chainages			No	Length	Width	Area sqm	Thickness	Volume cum
				1	2.00	1.30	2.60	0.15	0.39
11	91.00	to	92.00	1	2.50	1.30	3.25	0.15	0.49
				1	3.00	2.00	6.00	0.15	0.90
				1	3.00	1.00	3.00	0.15	0.45
12	92.00	to	93.00	1	8.00	2.30	18.40	0.15	2.76
				1	9.00	2.20	19.80	0.15	2.97
				1	10.00	2.50	25.00	0.15	3.75
13	93.00	to	94.00	1	4.00	2.20	8.80	0.15	1.32
				1	2.50	3.00	7.50	0.15	1.13
14	94.00	to	95.00	1	5.00	3.70	18.50	0.15	2.78
				1	2.60	1.60	4.16	0.15	0.62
15	95.00	to	96.00	1	2.50	1.60	4.00	0.15	0.60
				1	10.00	3.70	37.00	0.15	5.55
				1	9.00	3.00	27.00	0.15	4.05
17	97.00	to	98.00	1	1.50	1.00	1.50	0.15	0.23
				1	4.50	2.50	11.25	0.15	1.69
				1	2.00	1.60	3.20	0.15	0.48
18	98.00	to	99.00	1	3.00	2.40	7.20	0.15	1.08
				1	2.00	1.50	3.00	0.15	0.45
				1	10.00	3.70	37.00	0.15	5.55
				1	12.00	3.00	36.00	0.15	5.40
				1	8.00	2.60	20.80	0.15	3.12
19	99.00	to	100.00	1	12.00	3.00	36.00	0.15	5.40
				1	10.00	3.70	37.00	0.15	5.55
				1	8.00	3.00	24.00	0.15	3.60
				1	12.00	2.50	30.00	0.15	4.50
				1	2.00	1.40	2.80	0.15	0.42
20	100.00	to	101.00	1	5.00	2.50	12.50	0.15	1.88
				1	3.00	2.20	6.60	0.15	0.99
21	101.00	to	102.00	1	2.20	1.70	3.74	0.15	0.56
				1	3.00	2.00	6.00	0.15	0.90
				1	3.10	1.50	4.65	0.15	0.70
				1	11.00	3.75	41.25	0.15	6.19
				1	2.40	1.70	4.08	0.15	0.61
				1	2.00	1.00	2.00	0.15	0.30
				1	5.50	2.00	11.00	0.15	1.65
				1	12.00	3.00	36.00	0.15	5.40
				1	15.00	3.75	56.25	0.15	8.44
				1	14.00	3.75	52.50	0.15	7.88
				1	4.00	2.00	8.00	0.15	1.20
				1	5.20	2.00	10.40	0.15	1.56
22	102.00	to	103.00	1	2.00	1.50	3.00	0.15	0.45
				1	3.00	1.50	4.50	0.15	0.68
				1	3.50	1.50	5.25	0.15	0.79
23	104.00	to	105.00	1	2.20	1.40	3.08	0.15	0.46
				1	3.50	2.00	7.00	0.15	1.05
				1	10.00	3.75	37.50	0.15	5.63

### Measurement Sheet of Potholes

Sl.No	Chainages			No	Length	Width	Area sqm	Thickness	Volume cum	
				1	8.00	2.80	22.40	0.15	3.36	
				1	6.00	3.00	18.00	0.15	2.70	
				1	5.50	2.00	11.00	0.15	1.65	
24	105.00	to	106.00	1	6.50	2.00	13.00	0.15	1.95	
				1	12.00	3.00	36.00	0.15	5.40	
				1	2.40	1.00	2.40	0.15	0.36	
				1	3.00	2.00	6.00	0.15	0.90	
25	106.00	to	107.00	1	6.00	2.00	12.00	0.15	1.80	
				1	13.00	3.00	39.00	0.15	5.85	
				1	6.00	3.00	18.00	0.15	2.70	
				1	5.00	2.50	12.50	0.15	1.88	
				1	12.00	3.70	44.40	0.15	6.66	
				1	10.00	3.50	35.00	0.15	5.25	
				1	5.00	2.50	12.50	0.15	1.88	
26	107.00	to	108.00	1	2.00	1.00	2.00	0.15	0.30	
				1	1.00	1.00	1.00	0.15	0.15	
27	108.00	to	109.00	1	2.00	1.50	3.00	0.15	0.45	
				1	14.00	3.00	42.00	0.15	6.30	
				1	2.50	1.50	3.75	0.15	0.56	
				1	2.00	1.60	3.20	0.15	0.48	
							<b>Sqm :</b>	<b>1560.87</b>		<b>234.13</b>

RETAINING WALL TYPE-I : L = 10.0 m H = 3.0 m

Analysis of Cost for Construction of Stone Masonry Retaining wall as per Hill Road Manual Specification



Sl.No	Ref to SOR	Description	Unit	Nos	Length	Width	Depth	Quantity	Rate in Rs	Amount in Rs
1	12.1	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.	Cum	1	10.00	1.35	1.07	14.43		
	<b>I</b>	<b>Ordinary Soil</b>								
	<b>A</b>	<b>Manual means</b>								
	(i)	upto 3m depth	Cum	60%				8.66	571.28	4945.51
	<b>II</b>	<b>Ordinary rock (not requiring blasting)</b>								
	<b>A</b>	<b>Manual means</b>								
	(i)	upto 3m depth	Cum	40%				5.77	813.32	4693.86
2	12.4	<b>PCC 1:3:6 in Foundation</b> (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	Cum	1	10.00	1.35	0.15	2.03	8763.25	17745.57
3	12.7	Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specification								
	<b>(b)</b>	<b>Random Rubble Masonry</b>								
		Triangular portion	Cum	1	10.00	1.10	0.17	0.93		
		Rwall	Cum	1	10.00	0.85	3.00	25.50		
		Parapets	Cum	4	2.00	0.60	0.60	2.88		
							Total :	29.31	7260.08	212779.31

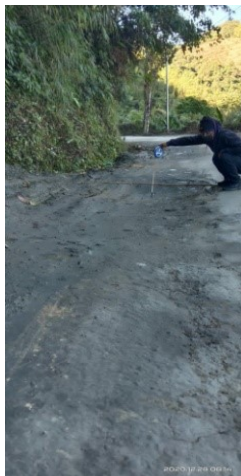


Sl.No	Ref to SOR	Description	Unit	Nos	Length	Width	Depth	Quantity	Rate in Rs	Amount in Rs
7	1.6	Cost of Haulage Excluding Loading and Unloading								
		i) Surface road :								
		Cement	24.23		Khawzawl to work Site			20.00	12.93	6267.03
		Aggregates	2.66		Chawngtlai Quarry to work Site			32.00	12.93	1101.35
		Sand	91.68		R.Tuipui to work Site			24.00	12.93	28461.97
		Masonry stone	70.71		Chawngtlai Quarry to work Site			32.00	12.93	29269.48
		Granular Materials	15.11		Chawngtlai Quarry to work Site			32.00	12.93	6255.21

**Total = Rs. 3,69,541**  
**Total after adjustment of VAT Rs. 3,48,624**

**For 1.00 m length = Rs. 36,954**

Photo of Pot holes between ch: 69/00 kmp to 110/00 kmp on NH-6



Photos of proposed Retaining wall on NH-6



Package	Existing Chainage		Existing Road Length (km)	Remarks
	Start	End		
I	69.015	92.300	23.29	Patch Repair, Retaining walls, Drain Clearance, Landslide Clearance etc considered for maintaining the existing NH-06 which is to be handed over to PWD upon construction of new Road
II	92.300	105.950	13.65	Only minor Pothole repair work considered since, we have to give existing road to EPC Contractor for maintaining in traffic worthy condition.
III	105.950	150.000	44.05	Patch Repair, Retaining walls, Drain Clearance, Landslide Clearance etc considered for maintaining the existing NH-06 which is to be handed over to PWD upon construction of new Road
			<b>80.99</b>	