

Summary of Quantities for Protection Works

S#	Description		Retaining wall	Gabion	Total Qty
1	Earthwork in Excavation				
a)	Ordinary Soil	Cum	2553	78632	81185
b)	Ordinary Rock	Cum	1702	52422	54123
c)	Hard Rock	Cum	0	0	0
2	PCC M-10 grade	Cum			0
3	PCC M-15 grade	Cum	387		387
4	Stone Masonary	Cum	0		0
4	RCC M-30	Cum	5551		5551
5	Reinforcement	MT	333		333
6	Filter Media	Cum	0		0
7	Weep holes	No	6825		6825
8	Gabion Wall	Cum		53376	53376
9	Chute Drain	M	410		410
10	Earthfill (To be reuse excavated earth)	Cum			0
11	Drainage Layer	Cum			0
12	Blast Spalls	Cum	4324		4324
13	Filter material below pitching	Cum	1441		1441

% FOR SOIL CLASSIFICATION IS AS FOLLOWS AS PER GEOLOGICAL REPORT

- | | | |
|----|---------------|-----|
| a) | Ordinary Soil | 60% |
| b) | Ordinary Rock | 40% |
| c) | Hard Rock | 0% |

Inputs

Total Length	0
Ht. of Wall above GL	1.5
Total Ht. (H)	2.5
Depth Below GL	1
Base Width (B)	1.63
Top Width of Ret Wall	1
Thk of Rubble backing	0.5
Thk of PCC	0.15

Quantification for Cement Masonry Retaining Wall RW1, Ht. = 2.5m

S#	Description	Unit	No.	Length	Width	Height	Qty
1	Excavation	Cum					
	For Retaining Wall		1	0.00	1.93	1.15	0.00
							0.00
2	PCC M-15 grade	Cum					
	Levelling course		1	0.00	1.93	0.15	0.00
							0.00
3	Cement masonry	Cum					
	Retaining wall		1	0.00	1.31	2.50	0.00
							0.00
4	Parapet	Cum					
			0	2.60	0.45	0.60	0.00
							0.00
5	Rubble backing for drainage (filter media)	Cum					
			1	0.00	0.50	1.50	0.00
							0.00

Inputs

Total Length	0
Ht. of Wall above GL	2
Total Ht. (H)	3
Depth Below GL	1
Base Width (B)	1.95
Top Width of Ret Wall	1
Thk of Rubble backing	0.5
Thk of PCC	0.15

Quantification for Cement Masonry Retaining Wall RW1, Ht. = 3m

S#	Description	Unit	No.	Length	Width	Height	Qty
1	Excavation	Cum					
	For Retaining Wall		1	0.00	2.25	1.15	0.00
							0.00
2	PCC M-15 grade	Cum					
	Levelling course		1	0.00	2.25	0.15	0.00
							0.00
3	Cement masonry	Cum					
	Retaining wall		1	0.00	1.48	3.00	0.00
							0.00
4	Parapet	Cum					
			0	2.60	0.45	0.60	0.00
							0.00
5	Rubble backing for drainage (filter media)	Cum					
			1	0.00	0.50	2.00	0.00
							0.00

Inputs

Total Length	0
Ht. of Wall above GL	4
Total Ht. (H)	5
Depth Below GL	1
Base Width (B)	3.25
Top Width of Ret Wall	1
Thk of Rubble backing	0.5
Thk of PCC	0.15

Quantification for Cement Masonry Retaining Wall RW2, Ht. = 5 m

S#	Description	Unit	No.	Length	Width	Height	Qty
1	Excavation	Cum					
	For Retaining Wall		1	0.00	3.55	1.15	0.00
							0.00
2	PCC M-15 grade	Cum					
	Levelling course		1	0.00	3.55	0.15	0.00
							0.00
3	Cement masonry	Cum					
	Retaining wall		1	0.00	2.13	5.00	0.00
							0.00
4	Parapet	Cum					
			0	2.60	0.45	0.60	0.00
							0.00
5	Rubble backing for drainage (filter media)	Cum					
			1	0.00	0.50	4.00	0.00
							0.00

Inputs

Total Length	0
Ht. of Wall above GL	5.5
Total Ht. (H)	6.5
Depth Below GL	1
Base Width (B)	4.23
Top Width of Ret Wall	1
Thk of Rubble backing	0.5
Thk of PCC	0.15

Quantification for Cement Masonry Retaining Wall RW2, Ht. = 6.5 m

S#	Description	Unit	No.	Length	Width	Height	Qty
1	Excavation	Cum					
	For Retaining Wall		1	0.00	4.53	1.15	0.00
							0.00
2	PCC M-15 grade	Cum					
	Levelling course		1	0.00	4.53	0.15	0.00
							0.00
3	Cement masonry	Cum					
	Retaining wall		1	0.00	2.61	6.50	0.00
							0.00
4	Parapet	Cum					
			0	2.60	0.45	0.60	0.00
							0.00
5	Rubble backing for drainage (filter media)	Cum					
			1	0.00	0.50	5.50	0.00
							0.00

Inputs

Total Length	0
Ht. of Wall above GL	6
Total Ht. (H)	7
Depth Below GL	1
Base Width (B)	4.55
Top Width of Ret Wall	1
Thk of Rubble backing	0.5
Thk of PCC	0.15

Quantification for Cement Masonry Retaining Wall RW2, Ht. = 7 m

S#	Description	Unit	No.	Length	Width	Height	Qty
1	Excavation	Cum					
	For Retaining Wall		1	0.00	4.85	1.15	0.00
							0.00
2	PCC M-15 grade	Cum					
	Levelling course		1	0.00	4.85	0.15	0.00
							0.00
3	Cement masonry	Cum					
	Retaining wall		1	0.00	2.78	7.00	0.00
							0.00
4	Parapet	Cum					
			0	2.60	0.45	0.60	0.00
							0.00
5	Rubble backing for drainage (filter media)	Cum					
			1	0.00	0.50	6.00	0.00
							0.00

Inputs**Balast Wall**

Total Length	2275
Total Ht. (H)	4.00
Ht. above GL	3.00
Depth Below GL	1.00
Straight Height of footing	0.60
Slant height of footing	0.30
Base Width	1.50
Bottom Width of Ret Wall	0.50
Thk of PCC	0.10
Thk of filter media	0.00

Balast Wall of 4m Ht

S No.	Item	Unit	No.	Length	Width	Height	Qty
1	Earth Work in Excavation	Cum					
	Retaining Wall		1	2275.00	1.70	1.10	4254.25
							4254.25
2	PCC M15 grade below footing	Cum					
	Retaining Wall		1	2275.00	1.70	0.10	386.75
							386.75
3	RCC M30 grade in footing	Cum					
	Straight portion		1	2275.00	1.50	0.60	2047.50
	Slant portion		1	2275.00	1.00	0.30	682.50
							2730.00
4	RCC M30 grade in Wall	Cum					
	Below GL		1	2275.00	0.40	3.10	2821.00
							2821.00
5	Reinforcement	Tonnes					
	Retaining Wall		@ 60kg/cum				333.06
							333.06
6	Filter media	Cum					
	Retaining Wall		1	2275.00	0.00	3.00	0.00
							0.00
7	Weep holes	Nos.					
	Retaining Wall		6825				6825.00
8	Chute Drain	M					
	On Slope		91	4.50			409.50
9	Stone Pitching on Slope	Cum					
	On Slope		2	2184.00	3.30	0.30	4324.32
10	Filler below Stone Pitching on Slope	Cum					
	On Slope		2	2184.00	3.30	0.10	1441.44

Quantification for Cement Masonry Breast Wall RW1, Ht. = 2.5m

S#	Description	Unit	No.	Length	Width	Height	Qty
1	Excavation	Cum					
	For Retaining Wall		1	0.00	1.05	0.35	0.00
							0.00
2	PCC M-15 grade	Cum					
	Levelling course		1	0.00	1.05	0.15	0.00
							0.00
3	Cement masonry	Cum					
	Retaining wall		1	0.00	0.80	1.80	0.00
							0.00
4	Parapet	Cum					
			0	2.60	0.45	0.60	0.00
							0.00
5	Rubble backing for drainage (filter media)	Cum					
			1	0.00	0.15	1.60	0.00
							0.00

Inputs

Total Length	0
Ht. of Wall above GL	1.60
Total Ht. (H)	1.80
Depth Below GL	0.20
Base Width (B)	1.05
Top Width of Ret Wall	0.55
Thk of Rubble backing	0.15
Thk of PCC	0.15

Quantification for Gabion type Retaining Wall RW4, Ht. = 4m							
S#	Description	Unit	No.	Length	Width	Height	Qty
1	Excavation	Cum					
	For gabion wall		1	1430.00	2.75	4.00	15730.00
							15730.00
2	Gabion wall	Cum					
	Boulder filling		4	1430.00	2.00	1.00	11440.00
							11440.00

Inputs

Total Length	1430
Height of panels	1.00
Width of panels	2.00
Total height of gabion wall	4.00

Quantification for Gabion type Retaining Wall RW4, Ht. = 8m							
S#	Description	Unit	No.	Length	Width	Height	Qty
1	Excavation	Cum					
	For gabion wall		1	1452.00	5.00	4.00	29040.00
	For gabion wall		1	1452.00	5.00	4.00	29040.00
	For Berm		1	1452.00	1.00	4.00	5808.00
							63888.00
2	Gabion wall	Cum					
	Boulder filling		8	1452.00	2.00	1.00	23232.00
							23232.00

Inputs

Total Length	1452
Height of panels	1
Width of panels	2
height of gabion wall 1	4
height of gabion wall 2	4

Quantification for PCC Breast Wall, Ht. = 2.5m

S#	Description	Unit	No.	Length	Width	Height	Qty
1	Excavation	Cum					
	For Breast Wall		1	0.00	1.05	0.50	0.00
							0.00
2	PCC M-15 grade	Cum					
	Levelling course		1	0.00	0.90	0.15	0.00
							0.00
3	Cement masonry	Cum					
	Breast Wall		1	0.00	0.73	2.50	0.00
				Deduct qty for area of weephole =			0.00
							0.00
4	Rubble backing for drainage (filter media)	Cum					
			1	0.00	0.15	2.50	0.00
							0.00
5	Weep hole for all height retaining wall	No	1	0.00	2.00		0.00
							0.00

Inputs

Total Length	0
Height of wall above GL	2.00
Height of wall below GL	0.50
Top width of wall	0.55
Bottom width of wall	0.90
Offset for PCC	0.00
Thickness of PCC	0.15
Filtermedia width	0.15

Muck Disposal Protection Gabion Wall Length

SASB Parking Area	40000	4	160000	534
At Exit of Long Tunnel	73090	4	292360	
Scar Area	25915	4	103660	290
After Ranga Morh	29805	4	119220	345
			675240	1169

Quantification for Gabion type Retaining Wall RW4, Ht. = 8m								Inputs	
S#	Description	Unit	No.	Length	Width	Height	Qty	Total Length	1169
1	Excavation	Cum						Height of panels	1
	For gabion wall		1	1169.00	5.00	4.00	23380.00	Width of panels	2
	For gabion wall		1	1169.00	5.00	4.00	23380.00	height of gabion wall 1	4
	For Berm		1	1169.00	1.00	4.00	4676.00	height of gabion wall 2	4
							51436.00		
2	Gabion wall	Cum							
	Boulder filling		8	1169.00	2.00	1.00	18704.00		
							18704.00		

QUANTITIES FOR CATCH DAMS AND DEFLECTING STRUCTURES

SI No	Description of Items	Unit	No	L	B	D	Qty
1	Design, providing construction drawings, providing methodology for construction of Reinforced Earth steepened slope as per <i>BS 8006:2010, FHWA NHI-10-024 (2009)</i> , supply of minimum 50mm wide geo synthetic strap, high adherence geosynthetic strap soil reinforcement with higher friction coefficients (varying from 1.5 at top to tanΦ at 6.0 m and below) or equivalent including galvanized steel mesh fascia (made from minimum 8mm diameter bars with hot-dip galvanization of 610 grams per sqm to be used), galvanized steel mechanical connectors (610 grams per sqm hot-dip galvanization), non-woven coir geotextile (if any as per approved drawings) as per the technical specification of Reinforced Earth Technology including technical assistance during installation of the Reinforced Earth Structure. This item has to be done by appointing a specialized agency meeting the eligibility criteria as mentioned in the technical specification to form Reinforced Earth steepened slope composite structure.	Per sqm of fascia	1	2100		10.25	21,525.00
2	Supply and laying of PCC leveling pad of M-15 grade (200mm x 250mm) and 100mm thick, L shape, M-15 grade PCC cover on the berm or bench (wherever applicable) as per approved drawing.	Cum	2	2100	0.2	0.10	84.00
3	Providing and laying of boulders in front of the Reinforced Earth fascia (average thickness 400mm) as per technical specification and drawing, size of boulder > 125 mm dressed, as per guidance of site incharge.	cum	2	2100	0.40	10.25	17,220.00
5	Providing and laying of needle punched or continuous filament non-woven geotextile made from polypropylene having minimum mass per unit area as 160 grams per sqm including manpower, tools, tackles, all complete.	sqm	1	2100	2.80	10.25	60,270.00
7	Supplying and placing of perforated drainage pipes of minimum 150 mm dia meter wrapped with geotextile as horizontal internal drains as per drawings and detailed technical specification including manpower, tools, tackles, all complete.	RM	1	2100			
8	Excavation of top soil upto a depth of minimum 2.5 m, as showing the drawings and cross section, including compaction of foundation soil, removal and disposal, as per the direction of engineer - in charge.	Cum	1	2100	6.00	1.00	
9	Supply and laying of RCC leveling pad of M-35 grade 500mm thick cover top of avalanche dam as per approved drawing and guidance of engineer - in - charge	Cum	1	2100	1.20	0.50	1,260.00
10	Supplying, fitting and placing HYSD bar reinforcement all complete as per drawing and Technical specifications and as directed by the Engineer-in-charge.	MT	60				75.60
11	Providing, supplying and laying of erosion control blanket of 600 GSM, made up of coconut coir, sandwiched between polypropylene net, including U hooks, seeds, manpower, machinaries etc. as per the direction of engineer - in charge	sqm of fascia area	1	2100	3.60		7,560.00
12	Supply, filling and compacting with select fill for reinforced earth slopes, including watering, ramming, consolidation and dressing complete as per requirement at site, the soil to be used as structural fill should be free draining granular fill, as per Morth Section 3100 guidelines or as per the direction and acceptance of Engineer - in - charge.	Cum	1	2100	3.60	8.00	60,480.00

Catch Dam

Ch. From	Ch. to	Total length	Section
2400	2650		Section-I
2720	2950		
3300	3450		
15750	16350	600	Section-III
17300	17550	250	

850**Deflection Dam**

Ch. From	Ch. to	Total length	Section
9800	9850	50	Section-III
10000	10050	50	
10500	10600	200	
11150	11250	100	
11500	11600	100	
13000	13075	75	
13325	13400	75	
14000	14075	75	
14275	14350	75	
14600	14700	100	
14800	14900	100	
15300	15750	100	
16900		150	

1250**Blast Wall**

Ch. From	Ch. to	Total length	Section
4025	4200		Section-I
9100	9250		Section-III
10050	10300	250	
12100	12300	200	
12525	13000	475	
13400	14000	600	
14350	14650	300	
14850	15300	450	

2275