Bill of quantities: Retaining wall "A+B"; L=340 m (110+230); H=3.6 m

Activity				Labour				Equipment*				Duration	
ID	Name	Unit	Quantity	Skill	Time Std. [hour/unit]	Work [hour]	Cap.	Type	Std.Perform. [unit/hour]	Work [hour]	Cap.	Calc. [hour]	Sched. [shift]
1	Topsoil excavation	m^3	1360.0					Dozer	60.00	22.67	1	22.67	2
								Excavator	90.00	15.11	1		
2	Sheetwall piling	m^2	1456.0	Blacksmith	-	-	2	Pile driver	5.00	291.20	1	291.20	30
				Labourer	-	-	6	Crawler crane+	-	-	1		
3	Excavation at the sheetwall	m^3	6914.0					Excavator	85.00	81.34	1	81.34	8
4	Excavating foundation trench	m^3	1119.0					Excavator	35.00	31.97	1	31.97	3
5	Grading	$10m^2$	118.3	Labourer	3.8100	450.72	4					112.68	13
6	Blinding	m^3	119.0	Labourer	4.4300	527.17	6	Tamper	-	-	2	87.86	13
7	Reinforcing foundation slab	t	37.4	Steel fitter	14.2000	531.08	4					132.77	13
				Labourer	7.6000	284.24	2						
8	Shuttering foundation slab	m^2	312.8	Carpenter	0.3800	118.86	4					29.72	3
				Labourer	0.0900	28.15	1						
9	Concreting foundation slab	m^3	482.8	Labourer	1.2600	608.33	6	Mixer truck+	5.00	-	1	101.39	13
10	Dismantle shuttering of foundation slab	m^2	312.8	Carpenter	0.1000	31.28	4					7.82	1
				Labourer	0.0200	6.26	1						
11	Refill along the foundation slab	m^3	272.0	Labourer	0.8500	231.20	4	Tamper	-	-	2	57.80	6
12	Shuttering wall, internal	m^2	1108.4	Carpenter	0.3800	421.19	4					105.30	13
				Labourer	0.0900	4910.21	1						
13	Reinforcing wall + placing spout holes	t	40.8	Steel fitter	14.2000	579.36	4					144.84	13
				Labourer	7.6000	310.08	2						
14	Shuttering wall, external + scaffold	m^2	1108.4	Carpenter	1.4300	1585.01	10					158.50	13
				Labourer	0.5900	653.96	4						
15	Concreting wall	m^3	510.0	Labourer	1.2600	642.60	6	Mixer truck+	5.00	-	1	107.10	13
								Concrete pump+	40.00	-	1		
16	Dismantle wall shuttering + scaffold	m^2	2216.8	Carpenter	0.5200	1152.74	10					115.27	13
				Labourer	0.2800	620.70	4						
17	Cascading old embankment	m^3	187.0	Labourer	1.7100	319.77	10	Excavator	35.00	5.34	1	31.98	3
18	Embankment building	m^3	11274.0					Dozer	110.00	102.49	1	102.49	10
								Vibro roller+	120.00	-	1		
19	Porous backfill behind the wall	m^3	6734.0	Labourer	0.1000	0.00	4	Excavator	55.00	122.44	1	122.44	13
								Tamper	-	-	2		
20	Pulling out sheetwall planks	m^2	1456.0	Blacksmith	-	-	2	Pile driver	10.00	145.60	1	145.60	15
				Labourer	-	-	6	Crawler crane+	-	-	1		
21	Gutter (drain) construction	m	340.0	Labourer	1.4100	479.40	4					119.85	13
22	Slope (hollow) excavation	m^3	4981.8					Excavator	85.00	58.61	1	58.61	6
23	Rendering the slope	$10m^2$	612.0	Labourer	1.0200	624.24	10					62.42	6
24	Levelling the ground	$10m^2$	2304.0	Labourer	-	-	2	Grader	300.00	7.68	1	7.68	1
25	Grassing	$10m^2$	2141.0	Labourer	0.4000	856.40	8					107.05	10

* Trucks/Lorries and/or power tools (e.g. poker vibrator, saw, bender, etc.) not indicated

+ For further technical parameters and/or estimates see Technical Report

Remarks:

Earth/gravel pit is on 7 km distance
Excavated topsoil should be loaded on trucks and sold
Excavated earth can be used for embankment building
For porous backfill, gravel should be added in proportion 1:3
Any earth fill should be compacted 3 times in not more than 25 cm thick layers
Poor viscosity concrete for blinding transported by dumper-truck
Reinforcement bars cut and bended at manufacturing steel-yard 11 km away
Concrete mixed at a central batching plant some 4 km away

Earth balance calculations: Retaining wall "A+B"; L=340 m (110+230); H=3.6 m

Section "A"; L=110; H=3.6 m			
ID	**Name**	**Unit**	**Quantity**
1	Topsoil excavation	m^3	440.0
3	Excavation at the sheetwall	m^3	0.0
4	Excavating foundation trench	m^3	362.0
11	Refill along the foundation slab	m^3	-88.0
17	Cascading old embankment	m^3	187.0
18	Embankment building	m^3	-11274.0
19	Porous backfill behind the wall	m^3	-4221.0
22	Slope (hollow) excavation	m^3	0.0
Σ			**-10813.0**

Section "B"; L=230; H=3.6 m			
ID	**Name**	**Unit**	**Quantity**
1	Topsoil excavation	m^3	920.0
3	Excavation at the sheetwall	m^3	6914.0
4	Excavating foundation trench	m^3	757.0
11	Refill along the foundation slab	m^3	-184.0
17	Cascading old embankment	m^3	0.0
18	Embankment building	m^3	0.0
19	Porous backfill behind the wall	m^3	-2513.0
22	Slope (hollow) excavation	m^3	4981.8
Σ			**12468.8**

Remarks:

Excavated topsoil (of 440+920=1360 m^3) should be loaded on trucks and sold

Assuming density (compaction) of earth fills should equal to that of original (excavated/natural) earth on site:
- Gravel (of 2247 m^3) as 1/3 part of porous backfill (of 4221+2513=6734 m^3) is to be brought from the pit 7 km away
- For completing porous backfill (6734-2247)-(12468.8-10813)=2833.8 m^3 is to be brought from the pit 7 km away

For transportation estimated bulking coefficient of earth/gravel is 1.28