1. BILL OF QUANTITIES FOR ANTI-EROSION WORKS - RASKA RIVER

Bill of Quantities for stone barrier in cement mortar Hk=1.7 m Krusevacka river

	Description	Unit	Qty	Unit price RSD	Total
	TECHNICAL WORKS				
	I PRELIMINARY WORKS				
1	Cut down softwood trees using motor sow, shorten trunks to a defined length, cut branches and pull trees out to a distance up to 20 meters.				
1a	Ø≤ 10cm	pcs	10	0.00	0.00
1b	Ø10-30cm	pcs	10	0.00	0.00
2	Clear the ground of twigs, branches, piled up rubble, as well as sludge, including load-on and transport to a distance of up to 1 km.	m^2	300	0.00	0.00
3	Geodetic marking of structures in the field (barrier).	lump sum	1	0.00	0.00
4	Construction of access points to deliver the material for the construction of barriers.	lump sum	1	0.00	0.00
5	Temporary land possession.	lump sum	1	0.00	0.00
	II EARTH WORKS				
6	Excavate earth for barrier foundation and stilling pool in the ground III and IV by excavating 80% mechanically and 20% manually and load excess earth into lorries.				
	Excavation for foundations	m^3	43	0.00	0.00
	Excavation for downstream structure and cut-off	m^3	362	0.00	0.00
	Calculation per m^3 of earth excavated and loaded into lorries.		405		
7	Build embankment from excavated earth entirely in accordance with relevant regulations and standards. Calculation per m^3 of embankment.	m^3	3	0.00	0.00
8	Transport excess excavated earth to forest roads and spread it evenly using bulldozer, at least three times over for compacting. Average transport distance is about 500 meters. Calculation per m^3 of transported, spread and compacted earth.	m^3	402	0.00	0.00
9	Pump water out of the foundation pit or drain water in some other way in order to enable works to proceed.	lump sum			0.00
10	Purchase, transport and construct gravel bedding d=10 cm. Calculation per m^3 of bedding installed.	m^3	6	0.00	0.00
	III STONE WORK				
11	Construct stone barrier in cement mortar. Minimum stone size shall be 25 cm. Payment per m3 of purchased and filled in stone.	m^3	47	0.00	0.00
12	Build downstream structure with stone cut-off in cement mortar. Minimum stone size shall be under 25 cm. Payment per m3 of purchased and filled in stone.	m^3	70	0.00	0.00
13	Build the slab of stone mound, downriver from barrier cut-off, 4 m in length. Payment per m3 of purchased and filled in stone.	m^3	13	0.00	0.00
14	Supply and instal the PVC piping Ø 100 mm for drainage in the stone wall	m'	4	0.00	0.00
	TOTAL				0.00

Bill of Quantities for stone barrier in cement mortar Hk = 4.5 m Sebecevska River					
	Description	**Unit**	**Qty**	**Unit price RSD**	**Total**
	TECHNICAL WORKS				
	I PRELIMINARY WORKS				
1	Cut down softwood trees using motor sow, shorten trunks to a defined length, cut branches and pull trees out to a distance up to 20 meters.				
1a	Ø до 10cm	pcs	10	0.00	0.00
1b	Ø10-30cm	pcs	10	0.00	0.00
2	Clear the ground of twigs, branches, piled up rubble, as well as sludge, including load-on and transport to a distance of up to 1 km.	m^2	300	0.00	0.00
3	Geodetic marking of structures in the field (barrier).	lump sum	1	0.00	0.00
4	Construction of access points to deliver the material for the	lump sum	1	0.00	0.00
5	Temporary land possession.	lump sum	1	0.00	0.00
	II EARTH WORKS				
6	Excavate earth for barrier foundation and stilling pool in the ground III and IV by excavating 80% mechanically and 20% manually and load excess earth into lorries.				
	Excavation for foundations	m^3	123	0.00	0.00
	Excavation for downstream structure and cut-off	m^3	37	0.00	0.00
	Calculation per m^3 of earth excavated and loaded into lorries.		160		
7	Build embankment from excavated earth entirely in accordance with relevant regulations and standards. Calculation per m^3 of embankment.	m^3	44	0.00	0.00
8	Transport excess excavated earth to forest roads and spread it evenly using bulldozer, at least three times over for compacting. Average transport distance is about 500 meters. Calculation per m^3 of transported, spread and compacted earth.	m^3	116	0.00	0.00
9	Pump water out of the foundation pit or drain water in some other way in order to enable works to proceed.	lump sum	1	0.00	0.00
10	Purchase, transport and construct gravel bedding d=10 cm. Calculation per m^3 of bedding installed.	m^3	6	0.00	0.00
	III STONE WORK				
11	Construct stone barrier in cement mortar. Minimum stone size shall be 25 cm. Payment per m3 of purchased and filled in stone.	m^3	177	0.00	0.00
12	Build downstream structure with stone cut-off in cement mortar. Minimum stone size shall be under 25 cm. Payment per m3 of purchased and filled in stone.	m^3	64	0.00	0.00
13	Build the slab of stone mound, downriver from barrier cut-off, 4 m in length. Payment per m3 of purchased and filled in stone.	m^3	13	0.00	0.00
	TOTAL				**0.00**
	I BIOTECHNICAL WORKS				
1	Manual excavation of earth in the stream bed to form plateau for building wattles to shift upstream. Calculation per m^3 of excavated earth.	m^3	35	0.00	0.00
2	Build a single wattle 0.7 – 0.9 m tall using acacia stakes 1.2 – 1.5 m long and wattle work using elm rods. Calculation per m' of installed wattle.	m'	60	0.00	0.00
3	Build the barrier using double wattle 1.20 m tall made of acacia stakes 1.80 to 2.0 m long. The distance between two wattle rows of 70 cm to be filled with stone material or large gravel from the river bed. Calculation per m' of double wattle.	m'	40	0.00	0.00
4	Protect downstream and upstream sides of the wattle using earth square.Calculation per m^3 of earth square.	m^3	48	0.00	0.00
	TOTAL				0.00

	SUMMARY for Sebecevska River				
	TECHNICAL AND WORKS				0.00
	BIOTECHNICAL WORKS				
	TOTAL				0.00
Bill of Quantities for stone barrier in cement mortar Hk = 4.0 m Ljudska River					
	Description	**Unit**	**Qty**	**Unit price RSD**	**Total**
	TECHNICAL WORKS				
	I PRELIMINARY WORKS				
1	Cut down softwood trees using motor sow, shorten trunks to a defined length, cut branches and pull trees out to a distance up to 20 meters.				
1a	Ø до 10cm	pcs	10	0.00	0.00
1b	Ø10-30cm	pcs	10	0.00	0.00
2	Clear the ground of twigs, branches, piled up rubble, as well as sludge, including load-on and transport to a distance of up to 1 km.	m^2	300	0.00	0.00
3	Geodetic marking of structures in the field (barrier).	lump sum	1	0.00	0.00
4	Construction of access points to deliver the material for the	lump sum	1	0.00	0.00
5	Temporary land possession.	lump sum	1	0.00	0.00
	II EARTH WORKS				
6	Excavate earth for barrier foundation and stilling pool in the ground III and IV by excavating 80% mechanically and 20% manually and load excess earth into lorries.				
	Excavation for foundations	m^3	259	0.00	0.00
	Excavation for downstream structure and cut-off	m^3	340	0.00	0.00
	Calculation per m^3 of earth excavated and loaded into lorries.		599		
7	Build embankment from excavated earth entirely in accordance with relevant regulations and standards. Calculation per m^3 of embankment.	m^3	5	0.00	0.00
8	Transport excess excavated earth to forest roads and spread it evenly using bulldozer, at least three times over for compacting. Average transport distance is about 500 meters. Calculation per m^3 of transported, spread and compacted earth.	m^3	594	0.00	0.00
9	Pump water out of the foundation pit or drain water in some other way in order to enable works to proceed.	lump sum	1	0.00	0.00
10	Purchase, transport and construct gravel bedding d=10 cm. Calculation per m^3 of bedding installed.	m^3	21	0.00	0.00
	III STONE WORK				
11	Construct stone barrier in cement mortar. Minimum stone size shall be 25 cm. Payment per m3 of purchased and filled in stone.	m^3	311	0.00	0.00
12	Build downstream structure with stone cut-off in cement mortar. Minimum stone size shall be under 25 cm. Payment per m3 of purchased and filled in stone.	m^3	177	0.00	0.00
13	Build the slab of stone mound, downriver from barrier cut-off, 4 m in length. Payment per m3 of purchased and filled in stone.	m^3	30	0.00	0.00
14	Supply and instal the PVC piping Ø 100 mm for drainage in the stone wall	m'	5	0.00	0.00
	TOTAL				**0.00**
	I BIOTECHNICAL WORKS				
1	Manual excavation of earth in the stream bed to form plateau for building wattles to shift upstream. Calculation per m^3 of excavated earth.	m^3	35	0.00	0.00
2	Build a single wattle 0.7 – 0.9 m tall using acacia stakes 1.2 – 1.5 m long and wattle work using elm rods. Calculation per m' of installed wattle.	m'	60	0.00	0.00

3	Build the barrier using double wattle 1.20 m tall made of acacia stakes 1.80 to 2.0 m long. The distance between two wattle rows of 70 cm to be filled with stone material or large gravel from the river bed. Calculation per m' of double wattle.	m'	40	0.00	0.00
4	Protect downstream and upstream sides of the wattle using earth square.Calculation per m³ of earth square.	m³	48	0.00	0.00
	TOTAL				0.00

	SUMMARY for Ljudska River				
	TECHNICAL WORKS				**0.00**
	BIOTECHNICAL WORKS				
	TOTAL				**0.00**
	Bill of Quantities for stone barrier in cement mortar Hk = 1.0 m Cvrnjanska river				
	I PRELIMINARY WORKS				
1	Cut down softwood trees using motor sow, shorten trunks to a defined length, cut branches and pull trees out to a distance up to 20 meters.				
1a	Ø≤ 10cm	pcs	10	0.00	0.00
1b	Ø10-30cm	pcs	10	0.00	0.00
2	Clear the ground of twigs, branches, piled up rubble, as well as sludge, including load-on and transport to a distance of up to 1 km.	m^2	300	0.00	0.00
3	Geodetic marking of structures in the field (barrier).	lump sum	1	0.00	0.00
4	Construction of access points to deliver the material for the construction of barriers.	lump sum	1	0.00	0.00
5	Temporary land possession.	lump sum	1	0.00	0.00
	II EARTH WORKS				
6	Excavate earth for barrier foundation and stilling pool in the ground III and IV by excavating 80% mechanically and 20% manually and load excess earth into lorries.				
	Excavation for foundations	m^3	32	0.00	0.00
	Excavation for downstream structure and cut-off	m^3	90	0.00	0.00
	Calculation per m^3 of earth excavated and loaded into lorries.		122		
7	Build embankment from excavated earth entirely in accordance with relevant regulations and standards. Calculation per m^3 of embankment.	m^3	5	0.00	0.00
8	Transport excess excavated earth to forest roads and spread it evenly using bulldozer, at least three times over for compacting. Average transport distance is about 500 meters. Calculation per m^3 of transported, spread and compacted earth.	m^3	117	0.00	0.00
9	Pump water out of the foundation pit or drain water in some other way in order to enable works to proceed.	lump sum			0.00
10	Purchase, transport and construct gravel bedding d=10 cm. Calculation per m^3 of bedding installed.	m^3	9	0.00	0.00
	III STONE WORK				
11	Construct stone barrier in cement mortar. Minimum stone size shall be 25 cm. Payment per m3 of purchased and filled in stone.	m^3	36	0.00	0.00
12	Build downstream structure with stone cut-off in cement mortar. Minimum stone size shall be under 25 cm. Payment per m3 of purchased and filled in stone.	m^3	75	0.00	0.00
13	Build the slab of stone mound, downriver from barrier cut-off, 4 m in length. Payment per m3 of purchased and filled in stone.	m^3	23	0.00	0.00
14	Supply and instal the PVC piping Ø 100 mm for drainage in the stone wall	m'	2	0.00	0.00
	TOTAL				0.00

	TOTAL SUMMARY				
I	**Hk=1.7 m Krusevacka river**				**0.00**
II	**Hk=4.5 m Sebecevska River**				**0.00**
III	**Hk=4.0 m Ljudska River**				**0.00**
IV	**Hk=1.0 m Cvrnjanska river**				**0.00**
			TOTAL		**0.00**