I ESTIMATED BILL OF QUANTITIES OF CIVIL AND SPECIALIST'S WORKS -
basement, ground floor and first floor

PROJECT: Reconstruction of High school in Obrenovac
INVESTOR: Republic of Serbia. Obrenovac High School

A.	**CIVIL WORKS**				
I	**PREPARATION AND DEMOLITION**	UoM	quantity	unit price	TOTAL
1.1.	Fabrication and installation of notice board about execution of civil works, with basic information about the project, contractor, investor and designer. Board size is 120 x 140 cm. Calculation per table piece.	pcs	1.00		
1.2.	Fabrication and installation of boards and other warning notices, according to technical regulations. Board size is 80 x 60 cm. Calculation per table piece.	pcs	3.00		
1.3.	Material supply, erection and dismantling of protective fence around the construction site made of PVC mesh 2m high. Stretching posts 2m high are placed at each 2m. Gate for the passage is to be installed and warning boards for pedestrians are to be installed on the fence. The fence is used during the construction. Calculation per meter of fence.				
		m	320.00		
1.4.	Fabrication and installation of signal lighting on the site, installed on the fence and/or scaffolding. Installation under voltage of 12V, with lamps protected by mesh shall be set up in consultation with the Supervision, and in line with the regulations. Lump sum calculation.	LS	1.00		
1.5.	During the works, the site shall be cleaned repeatedly to remove building debris and transport it to the site landfill. Payable once regardless of the number of cleaning. Calculation per sqm of the site.				
a	ground floor	m2	2,042.99		
b	basement	m2	187.17		
c	first floor	m2	1,637.79		
1.6.	Cleaning and washing of the site upon completion of all works. The entire site shall be thoroughly cleaned, all glass surfaces shall be washed, all interior spaces and exterior surfaces shall be cleaned and thoroughly washed. Calculation per sqm of gross floor area.				
a	basement	m2	187.17		
b	ground floor	m2	2,042.99		
c	first floor		1,637.79		
1.7.	Taking out new furniture from gymnasium, first floor classrooms and auxiliary rooms (benches, laboratory tables, chairs) and storing them at the location within the school as agreed with the Investor. Furniture shall be carefully unloaded and stored. Lump sum calculation.				
	ground floor	LS	1.00		
1.8.	Punching of partition brick wall d= 12-38cm for making door openings, including lintels. Careful demolition of parts of the wall, avoiding loosening of wall mass. Debris shall be collected, removed, loaded onto a truck and transported to the city landfill up to 15 km of distance. The price includes shoring. Calculation per m2 of wall.				
a	first floor	m3	2.30		
1.9.	Extension of openings in brick wall d=25-38m. Careful demolition of parts of the wall, avoiding loosening of wall mass. Debris shall be collected, removed, loaded onto a truck and transported to the city landfill up to 15 km of distance. The price includes shoring. Calculation per m3 of wall.				
		m3	1.96		
1.10.	Demolition of existing parts of brick walls d=25-38m, due to new door openings and expansion of existing openings. Parts of walls shall be carefully demolished, avoiding loosening of wall mass. Debris shall be collected, removed, loaded onto a truck and transported to the city landfill up to 15 km of distance. The price includes bracing. Calculation per cum of wall.				

		m3	3.50		
1.11.	Careful dismantling of wooden doors with wooden frames, area up to 2.50 sqm. Dismantled doors shall be assembled, loaded on a truck and transported to the city landfill up to 15 km of distance. Calculation per piece of doors.				
		pcs	30.00		
1.12.	Careful dismantling of PVC and aluminum doors with frame, area up to 5 sqm. Dismantled doors shall be assembled, loaded on a truck and transported to the city landfill up to 15 km of distance. Calculation per piece of doors.				
		pcs	19.00		
1.13.	Careful removal of casements of facade PVC joinery up to 3.00 m2. Dismantled casements shall be cleaned and prepared for hardware replacement. Calculation per piece of window.				
		pcs	14.00		
1.14.	Careful removal of casements of facade PVC joinery over 3.00 m2. Dismantled casements shall be cleaned and prepared for hardware replacement. Calculation per piece of window.				
		pcs	73.00		
1.15.	Careful dismantling of PVC and metal doors and partitions with frame, area up to 5 sqm. Dismantled doors shall be assembled, loaded on a truck and transported to the city landfill up to 15 km of distance. Calculation per piece of doors.				
		pcs	6.00		
1.16.	Careful dismantling of metal doors with frame, area up to 5 sqm. Dismantled doors shall be assembled, loaded on a truck and transported to the city landfill. Calculation per piece of doors.				
		pcs	4.00		
1.17.	Careful dismantling of facade windows, area up to 3 sqmtogether with the external flashings. Dismantled materialshall be cleaned, assembled, loaded on a truck and transported to the city landfill. Calculation per piece of window.				
a	basement	pcs	14.00		
b	ground floor	pcs	21.00		
1.18.	Careful dismantling of facade windows, area over 3 sqm together with the external flashings. Dismantled material shall be cleaned, assembled, loaded on a truck and transported to the city landfill. Calculation per piece of window.				
a	ground floor	pcs	86.00		
1.19.	Dismantling of protective grid made of steel bars on windows and doors of protected opening as well as the grid in the room for balls storage. After dismantling, the rods shall be stacked and stored at a place determined by the investor in school. Calculation per sqm of the protected area.				
		m2	132.00		
1.20.	Dismantling of aluminium and PVC partitions with doors in the hallway and bathrooms. After dismantling, partitions shall be packed up in the truck and transported to the place chosen by the investor. Calculation per meter of partition.				
		m	61.00		
1.21.	Demolition of chipboard partitions on substructure, height h=3.30m, between biology/physics classroom and storage room. When removed, partitions shall be packed, loaded to truck and transported to the place determined by the Investor. Calculation per meter.				
		m1	6.52		
1.22.	Demolition of partitions made of plasterboards on the substructure up to 3,5m of height in the hallway between the annex and the school, and on the walls of double-flight staircase. After partitions are removed, they shall be assembled and packed up on the truck and transported to the place chosen by the investor. Calculation per meter.				
		m	43.50		
1.23.	Demolition of partition walls made of brick d=7-12 cm with mortar. Entire walls shall be demolished with ring beams, lintels and all panelling on the wall. Usable bricks shall be cleaned of mortar and stacked on the construction site landfill. Debris shall be collected, removed, loaded onto a truck and transported to the city landfill. Calculation per sqm of wall, openings are deductible.				
a	basement	m2	17.60		
b	ground floor	m2	223.41		

1.24.	Demolition of bearing brick wall in the assembly hall, d=25 cm in flexible mortar. Walls shall be demolished with ring beams, lintels and all panelling on the wall. Usable bricks shall be cleaned of mortar and stacked on the construction site landfill. Debris shall be collected, removed, loaded onto a truck and transported to the city landfill. Calculation per cum of wall, openings are deductible.				
a	ground floor	m3	10.00		
1.25.	Demolition of brick lining of ventilation pipes. Usable bricks shall be cleaned of mortar and stacked on a construction site landfill. Debris shall be collected, removed, loaded onto a truck and transported to the city landfill. Calculation per sqm of wall.				
		m2	18.00		
1.26.	Demolition of part of the parapet wall below the window to enable installation of window and setup of blind PVC profile. Demolition shall be performed according to design details. Debris shall be collected, removed, loaded onto a truck and transported to the city landfill. Calculation per cum of wall.				
a	ground floor	m3	2.00		
1.27.	Stripping of mortar from internal walls. Mortar shall be stripped off and clamps used for cleaning joints up to 2cm deep. Clean brick surface with wire brush and wash the walls with water. Debris shall be collected, removed, loaded onto a truck and transported to the city landfill. Stripping is done on the entire ground floor. It is estimated that 70% of wall surfaces on the ground floor shall be stripped off. Calculation per sqm stripped off surface, openings are deductible.				
a	ground floor	m2	2,359.00		
b	first floor - 10%		269.77		
1.28.	Stripping of mortar and removal of the ceiling structure made of reeds and laths. Strip off mortar, remove reed and laths, collect debris, remove, load it to a truck and transport to the city landfill. Calculation per sqm of stripped ceiling surface.				
a	ground floor	m2	1,604.65		
b	first floor		1,409.58		
1.29.	Stripping plasterboards from the ceiling substructure. Stripped boards and substructure shall be collected, removed, loaded on a truck and transported to the city landfill up to 15 km of distance. Calculation per sqm of stripped ceiling surface.				
a	gymnasium	m2	183.82		
1.30.	Stripping concrete plinths from the walls in the corridor max. height 25 cm from the floor level, d=2-5cm. Strip off concrete, then collect, remove, load onto a truck and transport debris to the city landfill up to 15 km of distance. Calculation per meter of stripped plinth.				
a	ground floor	m	194.05		
1.31.	Careful demolition of concrete floor slab made of plain concrete in the basement d=12cm, along with waterproofing and lean concrete d=13cm. Calculation per sqm of slab to be demolished.				
a	basement	m2	155.00		
1.32.	Careful demolition of lightly reinforced concrete floor slab on the ground floor d=8 cm, in accordance with the demolition and masonry details. Calculation per sqm of slab to be demolished.				
a	ground floor - old school	m2	812.00		
b	ground floor - anex	m2	297.00		
c	ground floor - gym	m2	431.00		
1.33.	Stripping of PVC floor on the assumed base of lean concrete d=5cm in the gymnasium. Floor shall be stripped, loaded on a truck and transported to the city landfill. Calculation per sqm of blind floor.				
a	ground floor	m2	183.82		
1.34.	Stripping of terrazzo on the assumed base of lean concrete in the ground floor corridors d= 3 cm. Debris shall be collected, loaded into trucks and transported to the city landfill. Calculation per sqm of stripped floor.				
a	ground floor	m2	547.89		
1.35.	Stripping of vynil "SIMP" floor in classrooms on the assumed lean concrete base d=2cm. Debris shall be collected, loaded into trucks and transported to the city landfill. Calculation per sqm of stripped floor.				
a	ground floor	m2	593.93		
b	first floor	m2	501.11		

1.36.	Stripping of floor made of vynilasbestos tiles along with bitulit layer d=3cm in the building annex. Debris shall be collected, loaded on a truck and transported to the city landfill. Calculation per sqm of stripped floor.				
a	ground floor	m2	348.78		
b			351.03		
1.37.	Removal of laminate flooring in the corridor outside teacher's lounge and in offices. Debris shall be collected, loaded onto a truck and transported to the city landfill. Calculation per m2 of removed floor.				
		m2	105.91		
1.38.	Stripping of floor ceramic tiles in toilets on the assumed concrete base d=3cm. Debris shall be collected, loaded on a truck and transported to the city landfill. Calculation per sqm of stripped floor.				
a	ground floor	m2	54.16		
b			68.59		
1.39.	Stripping of ceramic tiles from internal walls in toilet facilities. Debris shall be collected, loaded on a truck and transported to the city landfill. Calculation per sqm of stripped floor.				
a	ground floor	m2	166.27		
b			309.07		
1.40.	Demolition of lightly reinforced concrete staircases d=8cm. Debris shall be removed, loaded on a truck and transported to the city landfill. Calculation per cum of slab.				
a	stairs to the basement 8*16.25/30	m3	0.80		
b	boiler room stairs 5*17/30	m3	0.40		
c	entry stairs 5*17/30	m3	0.70		
d	stairs to the hall 5*17/30	m3	1.10		
e	staircase flight ground floor-first floor 7*16/30	m3	0.80		
1.41.	Cutting of grooves on brick wall for placing RC lintels above the existing openings. Cutting of grooves shall be performed according to structural design, in two phases, because the lintels are concreted in two parts, according to the structural details. The first phase involves opening of a groove in the brick wall up to ½ wall thickness. After half of the lintel is concreted, the second half is demolished. It is necessary to leave 20cm longer opening on both sides of the window/door for fitting reinforced-concrete lintel on the wall. Debris shall be collected and taken out of the building and transported to the city landfill. Calculation per meter of groove.				
a	ground floor	m	37.10		
b			45.45		
	TOTAL PREPARATION AND DEMOLITION:				
II	**EARTHWORKS**				
POZ.	**DESCRIPTION**	UoM	KOLIČINA		**UKUPNO**
2.1.	Hand digging (40 %) and mechanical excavation (60%) in soil of II category inside the building for making the subbase beneath the slab and footings of the newly-designed columns. Excavation shall be carried out according to drawings and provided elevations. Excavation level inside the building is -0.64 m below the slab, i.e. -2.66 m below footings of newly-designed columns, -0.79 m below foundation beams of newly-designed partition walls. The sides shall be properly cut and the bottom shall be leveled. Part of the soil shall be stored on site landfill for later use in ground leveling, and the remaining soil shall be transported to the city landfill. Calculation per cum, in autochthonous condition.				
a	under the stairs and landing of basement	m3	2.00		
b	below the footings of assembly hall	m3	20.00		
c	below ground floor slab - old school	m3	490.00		
d	below ground floor slab - anex	m3	260.00		
e	below ground floor slab - gym	m3	180.00		
f	below foundation beams	m3	3.20		
g	below stairs and landing	m3	26.00		
2.2.	Hand digging in soil of II category inside the building for making the subbase beneath the basement slab. Excavation shall be carried out according to drawings and provided elevations. Excavation level is -2.78m from level 0.00. The sides shall be properly cut and the bottom shall be leveled. Soil and debris shall be hauled to city landfill up to 15 km of distance. Calculation per cum, in autochthonous condition.				

		m3	42.00		
2.3.	Mechanical excavation (90%) and hand digging (10%) in soil of II category for making new footings in the building annex for the subbase below the existing foundation strips. Excavation shall be carried out according to drawings and provided elevations. Excavation level is -2.34m in relation to the newly-designed level 0.00 below foundation strips that are underpinned. The sides shall be properly cut and the bottom shall be levelled. Soil and debris shall be transported to the city landfill up to 3 km of distance. Calculation per cum, in autochthonous condition.				
a	below foundation strips of the annex	m3	12.00		
2.4.	Supply, delivery, filling, spreading and compacting of subbase made of gravel 20 cm thickness with fraction 0-63, and 20 cm thickness with fraction 0-31.5mm, slab of ground floor, basement, stairs and landing. Gravel must be clean, free from organic impurities. Gravel shall be compacted mechanically until reaching the required compaction of 35 MPa below the second layer with fraction 0-31.5, or 25 MPa below the first layer with fraction 0-63. Calculation per sqm.				
a	below stairs	m3	11.00		
b	below ground floor slab - old school	m3	320.00		
c	below ground floor slab - anex	m3	175.00		
d	below ground floor slab - gym	m3	120.00		
	Total	m3	626.00		
2.5.	Supply, delivery, filling, spreading and compacting of subbase made of gravel, thickness 10 cm with fraction 0-31.5 mm below the footings, foundation beams and underpinned strips with fine accurate planning + -1cm. Gravel must be clean, free from organic impurities. Gravel shall be compacted mechanically until reaching the required compaction of 35 Mpa. Calculation per sqm.				
a	below stairs	m3	0.10		
b	below basement slab	m3	16.00		
c	below footings	m3	1.50		
d	below foundation beams and ventilation	m3	1.60		
	TOTAL	m3	19.20		
2.6.	Measuring the ground compaction below the footings. The required compaction is 35MPa. Compaction shall be measured once at each footing axis, and at each soil change in case changes are encountered. Measuring is done after excavation and after forming gravel subbase, while compaction shall be proved by certificates issued by authorized laboratories. Calculation per the number of measurements.				
	TOTAL	pcs	2.00		
2.7.	Measuring the ground compaction below the floor slab. The required compaction is 35MPa below fraction 0-31.5, i.e. 25MPa below fraction 0-63mm. Compaction shall be measured at round ten points of the floor slab, and at each soil change in case changes are encountered. Measuring is done after forming gravel subbase, while compaction shall be proved by certificates issued by authorized laboratories. Calculation per the number of measurements.				
a	below basement slab	pcs	2.00		
b	below ground floor slab - old school	pcs	5.00		
c	below ground floor slab - anex	pcs	3.00		
d	below ground floor slab - gym	pcs	2.00		
2.8.	Water pumping by sludge pumps from the excavation for footings due to a possible ingress of ground water during basement slab concreting. Since excavation is carried out near the middle of groundwater level, water shall be pumped from the foundation pits by pumping stations, if necessary (measured level of groundwater is approx. -2.00 m). The need for water pumping shall be determined by the Contractor in consultation with the Supervision. Calculation per hour.				
	TOTAL	h	30.00		
	TOTAL EARTHWORKS:				
	III CONCRETE AND REINFORCED-CONCRETE WORKS				
3.1.	Material supply and concreting of footings, foundation beams and foundation piers made of reinforced concrete C25/30 (MB 30) with the required boarding and struts. Tie beams are located at the top of foundation piers under the floor slab. Calculation per cum.				
a	Footings 200x200x40 150x150x40 I 100 x 100x40	m3	5.80		
b	Foundation beams 25 x 40	m3	6.00		
	TOTAL:	m3	11.80		

3.2.	Material supply and concreting of footings below underpinned ventilation ducts made of reinforced-concrete 25/30 (MB 30). Footings are concreted 25*40cm at the foundation depth – 0.64 cm. Calculation per cum.				
		m3	0.60		
3.3.	Material supply and C25/30 (MB 30) concrete pouring for horizontal and vertical reinforced-concrete elements of a small cross-section in required boarding. The price includes supply and installation of the necessary formwork. Calculation per cum.				
a	**horizontal ring beams 25/20**		0.15		
b	**columns on the ground floor 25x25cm**		1.15		
c	**columns on the ground floor fi 30cm**		0.25		
d	**beam 25/60cm**		1.70		
e	**Lintels 0.25*wall thickness*opening width + 0.4**		3.00		
f	**Lintels 0.12*wall thickness*opening width + 0.4**		1.40		
	TOTAL:	m3	7.65		
3.4.	Material supply and C25/30 (MB 30) concrete pouring for basement floor slab d=15cm, over the gravel subbase 35MPa. Joints between the slab and existing walls shall be made by XPS, which is the subject of a separate item. The price includes all necessary materials except reinforcing mesh which is calculated by a separate item. Calculation per sqm.				
a	basement slab d=15cm	m2	155.00		
3.5.	Material supply and C25/30 (MB 30) concrete pouring for ground floor slab d=12cm, over the previously prepared gravel subbase, compaction 35MPa. Joints between the slab and existing walls shall be made by XPS, which is the subject of a separate item. The price includes all necessary materials except reinforcing mesh which is calculated by a separate item. Calculation per sqm.				
a	slab on the ground - old school d=12cm	m2	825.00		
b	slab on the ground - anex d=12cm	m2	435.00		
c	slab on the ground - gym d=12cm	m2	300.00		
3.6.	Material supply and C25/30 (MB 30) concrete pouring for stairs. Works according to the design, structural analysis, and reinforcing details. Slab d=12cm. Calculation per sqm including necessary struts and fair-faced formwork.				
a	stairs toward basement 8*18/30	m3	1.50		
b	boiler room stairs 5*17/30	m3	1.00		
c	entry stairs 5*17/30	m3	1.60		
d	stairs to the hall 5*17/30	m3	2.00		
e	stair flight ground floor-first floor 7*16/30	m3	1.20		
	TOTAL:	m3	7.30		
3.7.	Material supply and working up opening jambs for doors by reinforced concrete C16/20 (MB 20) on both sides of the new opening for new door. Calculation per cum.				
	ground floor	m3	0.50		
	first floor	m3	0.50		
3.8.	Material supply and pouring of lean concrete C12/15 (MB 15) thickness d=5cm, beneath the newly-designed foundations in the annex and assembly hall. Calculation per sqm.				
		m2	16.50		
	TOTAL CONCRETE WORKS:				
	IV REINFORCING WORKS				
4.1.	Supply, transport, cutting, bending and installation of rebar B500B (GA 240/360, RA 400/500 and MA 500/560). Amount of rebar as per reinforcement details. The price includes spacers that fix the rebar distance from formwork. Calculation per kilogram.				
a	GA 240/360	kg	315.00		
b	MA 500/560 - ground floor old school	kg	4,524.00		
c	MA 500/560 - ground floor anex	kg	2,390.00		
d	MA 500/560 - ground floor gym	kg	1,621.00		
e	RA 400/500	kg	3,175.00		
	TOTAL:		12,025.00		
	REINFORCING WORKS TOTAL:				
	V MASONRY				

5.1.	Material supply and masonry of partition brick walls d=12 cm in flexible mortar, ratio 1:2:6. At the height of lintel beam and on top of the wall along the entire length of the wall, ring beam shall be concreted 12/20cm, reinforced ± 2RΦ12, which is included by this item. Wall shall be reinforced to be tied to the existing ones in accordance with structural analysis. The price includes necessary vertical ring beams that shall be constructed at the ends of new walls in order to connect the wall to the existing structure. Calculation per sqm.				
a	basement	m2	2.70		
b	ground floor	m2	239.00		
c	first floor	m2	41.39		
5.2.	Material supply and masonry of partition brick wall d=25 cm in flexible mortar, ratio 1:2:6. Wall shall be reinforced to be tied to the existing ones in accordance with structural analysis. Calculation per sqm.				
a	ground floor	m2	4.50		
5.3.	Underpinning of ventilation openings by bricks laid as shiners in flexible mortar, ratio 1:2:6. Calculation per sqm of floor area.				
		m2	52.89		
5.4.	Walling up of door opening in case opening is cancelled, but also adapting the opening to new joinery drawings by bricks in flexible mortar 1:2:6, d=12 or 25cm. Before masonry starts, block bonding cutting shall be performed on the existing wall. Bricks shall be wetted with water before placing. Masonry shall be performed in the correct bond, while joints shall be cleaned to a depth of 2 cm upon completion of masonry. The price includes auxiliary scaffolding. Calculation per cum.				
		m3	13.31		
5.5.	Material supply and plastering of interior walls with flexible mortar, ratio 1:3:9, in two layers. The first layer, d=1.5 cm, shall be performed with coarse, unscreened plaster, while the second layer will be made of screened plaster, thickness d=0.5 cm. Prior to plastering, the surfaces shall be cleaned from dust, washed and sprayed with cement slurry with sifted sand added. It is estimated that 70% of basement walls shall be plastered. Calculation per sqm of plastered surface, with all necessary preparatory work, material and scaffolding.				
a	basement	m2	229.60		
b	ground floor	m2	2,359.00		
c	first floor	m2	269.77		
5.6.	Material supply and plastering of stairs soffit with flexible mortar, ratio 1:3:9, in two layers. The first layer, d=1.5 cm, shall be performed with coarse, unscreened plaster, while the second layer will be made of screened plaster, thickness d=0.5 cm. Prior to plastering, the surfaces shall be cleaned from dust, washed and sprayed with cement slurry with sifted sand added. Calculation per sqm of plastered surface, with all necessary preparatory work, material and scaffolding.				
	stairs soffits	m2	40.80		
5.7.	Material supply and plastering of ventilation ducts with flexible mortar, ratio 1:3:9, in two layers. The first layer, d=1.5 cm, shall be performed with coarse, unscreened plaster, while the second layer will be made of screened plaster, thickness d=0.5 cm. Prior to plastering, the surfaces shall be cleaned from dust, washed and sprayed with cement slurry with sifted sand added. Calculation per sqm of plastered surface, with all necessary preparatory work, material and scaffolding.				
		m2	52.89		
5.8.	Material supply and construction of two-fraction (ratio between fractions of sand 1 and sand 2 80:20%) of cement screed, ratio 1:3, which is poured as a floor finish and waterproofing protection in the basement, d=5cm. Screed shall be constructed with the addition of polypropylene fibers, fibrin, which improve the mechanical properties. Fiber dosage according to the manufacturer's specifications. Screed shall be reinforced by reinforcing mesh Ø2.5mm. A power trowel shall be used for screed finish. Calculation per sqm.				
a	basement	m2	152.00		

5.9.	Material supply and construction of two-fraction (ratio between fractions of sand 1 and sand 2 80:20%) of cement screed, ratio 1:3, which is poured as a floor base, d=5cm. Screed shall be constructed with the addition of polypropylene fibers, fibrin, which improve the mechanical properties. Fiber dosage according to the manufacturer's specifications. Screed shall be reinforced by reinforcing mesh Ø2.5mm. The upper surface shall be thoroughly floated and prepared for flooring by power trowel. Calculation per sqm.				
	ground floor - old school	m2	1,376.00		
5.10.	Material supply and construction of two-fraction (ratio between fractions of sand 1 and sand 2 80:20%) of cement screed, ratio 1:3, which is poured as a floor base slightly inclined to overcome the floor height difference d=5cm. Screed shall be constructed with the addition of polypropylene fibers, fibrin, which improve the mechanical properties. Fiber dosage according to the manufacturer's specifications. Screed shall be reinforced by reinforcing mesh Ø2.5mm. The upper surface shall be thoroughly floated and prepared for flooring by power trowel. Calculation per sqm.				
a	ramp in the corridor	m2	7.20		
5.11.	Material supply and construction of two-fraction (ratio between fractions of sand 1 and sand 2 80:20%) of cement screed, ratio 1:3, which is poured as floor finish of substation, d=5cm. Screed shall be constructed with the addition of polypropylene fibers, fibrin, which improve the mechanical properties. Fiber dosage according to the manufacturer's specifications. Screed shall be reinforced by reinforcing mesh Ø2.5mm. A power trowel and construction of ferro concrete shall be used for screed finish. Calculation per sqm.				
a	substation floor	m2	34.00		
5.12.	Material supply and construction of two-fraction (ratio between fractions of sand 1 and sand 2 80:20%) of cement screed, ratio 1:3, which is poured as floor base in the gymnasium, d=8cm. Screed shall be constructed with the addition of polypropylene fibers, fibrin, which improve the mechanical properties. Fiber dosage according to the manufacturer's specifications. Screed shall be reinforced by reinforcing mesh Ø2.5mm. The upper surface shall be thoroughly floated and prepared for flooring by power trowel. Calculation per sqm.				
a	gymnasium	m2	184.00		
5.13.	Material supply and masonry of ventilation ducts made of double- and single-duct SUNT elements, size 20x27 and 20x15, respectively, according to the design. Calculation per meter.				
a	single-duct 20x15cm	m	17.00		
b	double-duct 20x27cm	m	15.00		
	TOTAL MASONRY:				
	VI INSULATION WORKS				
6.1.	Material supply and construction of horizontal waterproofing of floor slab as protection against underground moisture. Insulation shall be performed over a completely dry and clean surface. Cold coating bitulit "A" shall be applied by brush, at temperatures higher than 10 degrees. Welding of bituminous strips, similar to type IZOTEM V4, shall be done by heating the strips by burner with open flame, softening of bituminous mass of the surface to be glued, and sticking to the base by its own mass. The strip shall be glued by its entire surface, with overlaps of min.10 cm. Insulation shall be tucked along the wall on the inside 30 cm over the coves at adequately prepared base (it is necessary to strip plaster from the walls, which is included by plastering item). At exit points, insulation shall be overhung to access landings. Calculation per sqm.				
a	ground floor	m2	1,840.00		
6.2.	Supply and installation of waterproofing for repairing of the existing walls and new basement slab in buildings affected by moisture. The walls and basement slab shall be penetrated by waterproofing similar to type ISOMAT AQUAMAT PENETRAT. The base shall be thoroughly cleaned from all loose particles, grease and dust. Coating is carried out continuously in two layers according to the manufacturer's instructions. Special attention is paid to the joint between wall and slab. Expansion joint of 1 cm shall be coated with polyurethane sealant similar to type Isomat FLEX PU 40. Coving is then constructed and penetrated. Calculation per sqm.				
a	basement floor and stairs	m2	162.00		
b	basement walls	m2	230.00		
6.3.	Material supply and installation of PVC foil over thermal and sound insulation, and under cement screed in floors, i.e. beneath stairs slab. Calculation per sqm.				

	TOTAL:	m2	1,560.00		
6.4.	Material supply and installation of PE foil between thermal insulation and plasterboards in substation. Calculation per sqm.				
	TOTAL:	m2	32.18		
6.5.	Supply and installation of horizontal waterproofing in toilets above the basement by elastic two-component polymer-cement coatings similar to type AQUAMAT ELASTIC. Coating is applied continuously in two layers according to the manufacturer's instructions. Coating is performed along the wall to a height of 30 cm. Special attention shall be paid to covings. Calculation per sqm.				
	TOTAL:	m2	140.30		
6.6.	Material supply and installation of thermal insulation in suspended ceiling in the form of mineral rock wool, density 30 kg/cum, in the substation and the basement of the building, similar to type KNAUF KRS. Mineral plates shall be mounted on the suspended ceiling slab. Calculation per sqm.				
a	Basement D=8 cm	m2	160.00		
b	Substation D=15 cm	m2	32.18		
6.7.	Supply and installation of "styrodur" plates similar to type Austrotherm XPS 30 between expansion walls and slab. Styrodur shall be placed simultaneously with the construction of walls, according to the design. Calculation per sqm of placed styrodur plates.				
a	D= 3 cm expansion - classroom and corridors - old school	m2	46.00		
	D= 3 cm expansion - anex		24.00		
	D= 3 cm expansion - gym		16.00		
6.8.	Supply and installation of thermal insulation in the floor of the ground floor similar to type Austrotherm XPS 30 on the ground floor in facility I. Calculation per sqm of installed plates.				
a	D= 7cm in floor - classroom and corridors - old school	m2	825.00		
	D= 7cm in floor - anex	m2	435.00		
	D= 7cm in floor - gym	m2	300.00		
	TOTAL INSULATION WORKS:				
B.	**SPECIALIST'S WORKS**				
	VII-VIII JOINERY				
	VII ALUMINIUM JOINERY				
7.1.	Material supply, fabrication and installation of interior aluminum doors. Door leaf is made of powder-coated aluminium sections without thermal bridges, filled with decorative chipboard, thickness d=18mm, color and pattern of designer's choice. Doors open around its vertical axis. Doors are installed without a threshold. Door hardware is made of anodised aluminum, three hinges, lock cylinder and 3 keys, powder-coated aluminum door handles, all in accordance with the manufacturer's instructions and joinery drawings. Calculation per piece.				
	A - 105/210 cm	pcs	34.00		
	B - 95/205 cm	pcs	3.00		
7.2.	Material supply, fabrication and installation of interior aluminum doors. Door leaf is made of powder-coated aluminium sections without thermal bridges, with aluminium panel infill. Doors open around its vertical axis. Doors are installed without a threshold. Door hardware is made of anodised aluminum, three hinges, lock cylinder and 3 keys, powder-coated aluminum door handles, all in accordance with the manufacturer's instructions and joinery drawings. Calculation per piece.				
	C - 95/215 cm	pcs	4.00		
	D - 90/210 cm	pcs	7.00		
	E - 75/210 cm	pcs	14.00		
	G - 85/205 cm	pcs	5.00		
	H - 160/220 cm	pcs	1.00		
	I – 285/275 cm	pcs	1.00		
	J - 105/210 cm	pcs	2.00		

7.3.	Material supply, fabrication and installation of interior aluminum doors. Door leaf is made of powder-coated aluminium sections without thermal bridges, filled with crack-off glass, thickness of 6mm. For installation purposes, blind section is installed above the upper section. Doors open around its vertical axis. Doors are installed without a threshold. Door hardware is made of anodised aluminum, three hinges, lock cylinder and 3 keys, powder-coated aluminum door handles, all in accordance with the manufacturer's instructions and joinery drawings. Calculation per piece.				
	K - 405/330 cm	pcs	2.00		
	L – 347/330 cm	pcs	1.00		
	M – 261/330 cm	pcs	1.00		
7.4.	Material supply, fabrication and installation of fixed internal aluminum roof light. The window is made of powder-coated aluminum sections without thermal bridge, with glass filling 6mm thick, all in accordance with the manufacturer's instructions and joinery drawings. Calculation per piece.				
	F - 260/115 cm	pcs	2.00		
7.5.	Material supply, fabrication and installation of exterior aluminum doors. Frame structure and door leaves are made of aluminium sections with thermal bridges, powder-coated in white. Sections shall have the prescribed seals for frame and glass. For installation purposes, blind sections are installed above the upper section and on the door frame sides. Doors are installed without a threshold, and shall have brushes at the bottom of the door leaves. Glazing is done by double low-emission ("low e") tempered glass 6+12+6mm, argon filled with metal coating. Doors open outward and around its vertical axis. Door hardware is made of anodised aluminum in white both on the outside and inside, door closer and hinges, lock cylinder and 3 keys, handles for upper leaves opening, all in accordance with the manufacturer's instructions and joinery drawings. Calculation per piece.				
	3 – 230/330 cm ground floor	pcs	1.00		
	4 – 230/330 cm ground floor	pcs	1.00		
	5 – 324/285 cm ground floor	pcs	1.00		
	6 – 324/285 cm ground floor	pcs	1.00		
	7 – 176/285 cm ground floor	pcs	1.00		
	8 – 420/285 cm ground floor	pcs	1.00		
	9 – 176/285 cm ground floor	pcs	1.00		
	10 – 220/265 cm ground floor	pcs	1.00		
	12 – 405/285 cm ground floor	pcs	1.00		
7.6.	Material supply, fabrication and installation of exterior aluminum windows. Frame structure and window leaves are made of aluminium sections without thermal bridges, powder-coated in white. Sections shall have the prescribed seals for frame and glass. Glazing is done by double float glass thickness 4+12+4. Windowsill is installed on the outer side, made of powder-coated galvanized sheet in white RAL 9002, d=0.6 mm, with drip 2cm from the façade plane falling outwards, which is subject to a separate item. Window opens around its lower horizontal axis. Window hardware is in accordance with the manufacturer's instructions and joinery drawings. Calculation per piece.				
	1 - 130/45 cm basement	pcs	8.00		
	2 – 85/45 cm basement	pcs	6.00		
7.7.	Material supply, fabrication and installation of interior aluminum doors for basement entry. Door leaves is made of powder-coated aluminium sections without thermal bridges, with aluminium panel infill. Doors open outward and around its vertical axis. Roof lights are fixed, glazed with float glass 4+12+4mm. Doors are installed without a threshold, and shall have brushes at the bottom of the door leaves. Door hardware is made of anodised aluminium, three hinges, lock cylinder and 3 keys, aluminium powder-coated handle, all in accordance with the manufacturer's instructions and joinery drawings. Calculation per piece.				
	11 – 165/265 cm ground floor	pcs	1.00		
7.8.	Material supply, fabrication and installation of lightweight aluminum partitions made of powder-coated aluminum sections with aluminum panels in toilets. Partitions open around their vertical axis, have powder-coated steel handles on both door sides, lock cylinder, hinges and LED lamps, all in accordance with the manufacturer's instructions. Partition is placed at a height of 0.2m from FFL, total height 2.10m, all in accordance with the architectural design and joinery drawings. Calculation per meter of partition, including the fixed parts and doors, dim.70/190 cm.				
	N	m	41.35		

	TOTAL ALUMINIUM JOINERY:				
	VIII PVC JOINERY				
8.1.	Material supply, fabrication and installation of PVC exterior windows in ground floor. Frame and window casement structure is made of six-chamber white PVC sections. They are strengthened with metal elements protected from corrosion and have the prescribed seals for frame and glass. Standard PVC section 40x30mm is installed below the bottom section of window frame. Window is glazed by double low-emission ("low e") glass 4+12+4 mm, filled with argon with a metal coating. Uw = 1.2W/sqmk On the outer side, window sills are installed made of powder-coated galvanized sheet in white RAL 9002 d=0.6 mm, with outward drip 2cm from the façade plane. On the inner side, the existing terrazzo parapet remains, and shell be cleaned, polished and coated with a protective varnish. Windows open around the vertical axis and the lower horizontal axis, all in accordance with joinery drawings. Hardware is in line with manufacturer's instructions, with handles for opening the upper casements, at the height of 110cm from FFL, all in accordance with joinery drawings. Calculation per piece.				
	1 – 285/240 cm ground floor	pcs	50.00		
	2 – 195/240 cm ground floor	pcs	12.00		
	3 – 165/190 cm ground floor	pcs	3.00		
	4 – 285/110 cm ground floor	pcs	2.00		
	5 – 285/145 cm ground floor	pcs	18.00		
	6 – 175/90 cm ground floor	pcs	8.00		
	7 – 75/90 cm ground floor	pcs	8.00		
	8 – 85/90 cm ground floor	pcs	4.00		
	9 – 170/135 cm ground floor	pcs	1.00		
	12 – 195/170 cm ground floor	pcs	1.00		
8.2	Procurement of materials, fabrication and replacement of complete turn-turn fitting in existing PVC windows on the first floor. Replacement of complete fittings all in accordance with the manufacturer's instructions and joinery drawings. Procurement of materials and replacement of the seals on the windows. Opening around the vertical axis and the end of the lower horizontal axis, all in accordance with joinery drawings. Calculation per piece.				
	1 – 285/240 cm first floor		59.00		
	2 – 195/240 cm first floor		12.00		
	6 – 175/90 cm first floor		3.00		
	7 – 75/90 cm first floor		6.00		
	8 – 85/90 cm first floor		4.00		
	9 – 170/135 cm first floor		1.00		
	10 – 405/315 cm first floor		1.00		
	11 – 410/415 cm first floor		1.00		
	TOTAL PVC JOINERY:				
	IX METAL WORK				
9.1.	Material supply, fabrication and installation of double steel doors on heating substation made of galvanized steel sheet filled with cardboard honeycomb. Door frame is made of galvanized steel sections type "Z". Door leaves are made of box sections with flashings on both sides, sheet thickness d=2mm. The door leaf and frame are powder-coated in white. Opening around the vertical axis. Door latch is made of powder-coated steel on both sides of the door, adjustable three-piece steel hinges with ball bearing, cylinder lock with three keys, all in accordance with the manufacturer's instructions and joinery drawings. Calculation per piece.				
	1 – 195/210 cm ground floor	pcs	1.00		
9.2.	Material supply, fabrication and installation of single fire doors similar to type “Ninz univer” made of galvanized steel sheet, fire rated 30 min (EI30), with non-combustible material infill. Door frame is made of galvanized steel sections type "Z". Door frame is lined by sealing rubber and expanding strip. Door leaf and frame are powder-coated to achieve orange peel texture in white. Doors are without threshold. Door plate evidencing the issued door certificate. Opening around the vertical axis. Fire cylinder lock with three keys, powder-coated steel handle, adjustable three-piece steel hinges with ball bearing, all in accordance with the manufacturer's instructions and joinery drawings. Calculation per piece.				
	A – 95/205 cm ground floor	pcs	1.00		

9.3.	Material supply, fabrication and installation of basement steel doors made of galvanized steel sheet, filled with cardboard honeycomb. Door frame is made of galvanized steel sections type "Z". Door leaf is made of steel box sections with flashings on both sides, sheet thickness d=2mm. The door leaf and frame are powder-coated in dark grey. Opening around the vertical axis. Door latch is made of powder-coated steel on both sides of the door, adjustable three-piece steel hinges with ball bearing, cylinder lock with three keys, all in accordance with the manufacturer's instructions and joinery drawings. Calculation per piece.				
	B – 90/210 cm basement	pcs	2.00		
	C – 155/215 cm basement	pcs	1.00		
9.4.	Material supply and installation of double aluminium smoke doors. Door leaf is made of galvanized aluminium sections without thermal bridge, with tempered glass infill 6mm thick. Opening around the vertical axis. Door frame is lined by smoke sealing rubber and expanding strip, which provides sealing and prevents the passage of smoke between the door leaf and frame. Door leaf and frame are powder-coated to achieve orange peel texture in RAL at designer’s choice. Cylinder lock, powder-coated steel handle, adjustable three-piece steel hinges with ball bearing, magnets and door closer, all in accordance with the manufacturer's instructions and joinery drawings. Calculation per piece.				
	D – 200/210cm	pcs	2.00		
9.5.	Material supply and manufacture of stair structure and railing in the storeroom next to chemistry classroom on the ground floor - box profiles 50x50x3mm, according to the design. The price includes painting with primer and finish in two coats. Calculation per kg.	kg	250.00		
9.6.	Material supply and construction of anti-slip stair treads made of hot-rolled steel perforated sheet in the storeroom next to chemistry classroom on the ground floor, stairs dim. 300x1200x60mm, sheet thickness d=5mm. Construction of steps according to the design. The price includes the painting with primer and finish in two coats. Calculation per sqm.	m2	1.44		
9.7.	Material supply and painting of existing stair railing. Steel sections shall be sanded and cleaned from rust and then. Painting of steel elements by primer and finish in two coats, all in accordance with the designer’s choice. Railing is 1m high. Calculation per meter. Restoration of a new wooden balustrade of the existing stair railing. The wooden balustrade shall be cleaned, sanded and re-coated with transparent gloss varnish in two coats. Calculation per meter.				
	Steel railing	m	11.00		
	Wooden balustrade	m	11.00		
	TOTAL METAL WORK:				
	X FLOORING WORKS				
10.1.	Material supply and levelling of the existing base made of cast terrazzo by self-leveling floor finish on the ground floor where slab was not demolished (above the basement, at annex entrance, and on the stairs to the first floor), as the preparation for vinyl flooring. Surface shall be cleaned and coated with adequate primer, covered by self-leveling floor finish to firmly and permanently adhere to the base. Self-leveling floor finish must have the necessary resistance to pressure. Base shall be ground and dedusted. Calculation per sqm of treated surface.				
	TOTAL	m2	495.29		

10.2.	Material supply and installation of heterogeneous vinyl flooring in rolls similar to type "Tarkett Force" in classrooms, locker rooms on the ground floor, according to the design. Floor is placed on the previously prepared base and glued at the entire surface of the floor. Floor has a high degree of resistance to wear. Floor pattern at the author's choice. Flooring: applying ecological dispersive coating. After drying, ecological self-leveling layer up to 3 mm, strength >25kN. After self-levelling layer is dried, it shall be thoroughly ground, cleaned and vacuumed. Such a prepared surface, of max. moisture of 2% shall be covered by heterogeneous vinyl flooring, thickness 2.5 mm, wearing course 0.6 mm, wear T class (according to EN 600 and 660), with durable PUR protection, fire rating Bfl s1 (according to EN 13501-1), and weighing up to 2500g/sqm, class 33-42 (EN 685), slip resistance R9, not supporting the development of mold and fungi. Vinyl flooring shall be cut as dry, glued to the floor by dispersive, ecological glue - joints welding by electrode of color matching the selected flooring. After welding, joint shall be flush with the floor. All floors shall be performed with rounded transition and vertical covings at the joint with the wall at a height of 15 cm. The quality and type of floor "Tarkett - Force". All waste shall be transported to the city landfill. Calculation per sqm of performed flooring area including covings (floor area).				
	TOTAL	m2	2,105.12		
10.3	Material supply and installation of antistatic vinyl flooring similar to type "Tarkett IQ Toro SC" in server room and IT classroom. Floor is placed on the previously prepared base and glued at the entire surface of the floor. Floor has a high degree of resistance to wear. Floor pattern at the author's choice. Flooring: applying ecological dispersive coating. After drying, ecological self-leveling layer up to 3 mm, strength >25kN. After self-levelling layer is dried, it shall be thoroughly ground, cleaned and vacuumed. Such a prepared surface, of max. moisture of 2% shall be covered by homogeneous conductive vinyl flooring, with non-directional pattern thickness 2 mm, wear class P (according to EN 600 and 660), with durable PUR protection, fire rating Bfl s1 (according to EN 13501-1), weighing up to 2950g/sqm, class 34-43 (EN 685), slip resistance R9, roll dimensions 2X23m that does not support the development of mold and fungi and to the electrical resistance of $5x10^4\Omega$ to $10^6\Omega$ (according to EN 1081), and the previously prepared and leveled cement screed (max humidity 2%). Before laying conductive vinyl flooring, leveling the floor glue copper strip around the perimeter of the room, at a distance of 30-40 cm from the wall and strip exported to the site designated for grounding. After one place for grounding the corresponding area of 40 m2. The interior volume of a grounded affix the same copper strip in the direction of the shorter side of the room, to the max. distance of 60 cm, the total length of the room. Antistatic vinyl flooring shall be cut as dry, glued to the floor by dispersive, conductive and ecological glue - joints welding by electrode of color matching the selected flooring. After welding, joint shall be flush with the floor. The quality and type of floor "TARKETT - iQ Toro SC", or of equivalent, or better features, colour chosen by the designer. All waste shall be transported to the city landfill. Calculation per sqm of performed flooring area including covings (floor area).				
			61.88		

10.4.	Material supply and installation of sports vinyl flooring similar to type "Tarkett Omnisports reference". Floor is placed on the previously prepared base and glued at the entire surface of the floor. Floor has a high degree of resistance to wear. Floor pattern at the author's choice. Flooring: applying ecological dispersive coating. After drying, ecological self-leveling layer up to 3 mm, strength >25kN. After self-levelling layer is dried, it shall be thoroughly ground, cleaned and vacuumed. Such a prepared surface, of max. moisture of 2% shall be covered by heterogeneous sports vinyl flooring, thickness 6.5 mm, fire rating Cfl s1 (according to EN 13501-1), B1 under DIN, weighing up to 4710g/sqm, with friction coefficient of 88 (EN 13036-4), vertical ball bounce of 99% (EN 12235), rolls dimensions 2X21m. Vinyl flooring shall be cut as dry, glued to the floor by dispersive, ecological glue - joints welding by electrode of color matching the selected flooring. After welding, joint shall be flush with the floor. The quality and type of floor "Tarkett - Omnisport Reference", or of equivalent, or better features, colour chosen by the designer. Sports flooring shall have FIVB, FIBA, and EHF or IHF certificates to be submitted with the bid. The price includes marking the courts for handball, basketball and volleyball, lines are 5 cm wide, all in accordance with the flooring manufacturer's instructions. All waste shall be transported to the city landfill. Calculation per sqm of performed flooring area including covings (floor area).				
	TOTAL	m2	185.00		
10.5.	Material supply and installation of transitional aluminum strips at the joints between granite tiles in the corridor and vinyl flooring in the classrooms. Strips shall be installed in accordance with the manufacturer's instructions. The price includes all connecting and sealing material. Price per meter.				
	TOTAL	m	15.75		
	TOTAL FLOORING WORKS:				
	XI TILING WORKS				
11.1.	Material supply and installation of I class wall ceramic tiles on the glue in toilets, utility room and storeroom, and classrooms and storerooms next to wash basin. The base must be flat, smooth, firm and clean. I class tiles shall be butt joint glued. If necessary, tile edges shall be manually grounded. Tiled surfaces must be flat and vertical. Angle joints can be performed by bevelled tiles. Tiles joints shall be pointed in the color of the author’s choice. The price includes all necessary labour and material, all unnecessarily damaged tiles will be charged to the Contractor through the minutes of the Supervision. Tiles shall be placed at the entire height of the wall except in a utility room and storeroom, where tiling is done up to height of 150 cm. Calculation per sqm of tiling.				
a	utility and storeroom, classrooms and storerooms, h=1,50	m2	60.46		
b	toilets	m2	607.24		
11.2.	Material supply and installation of I class floor ceramic anti-slip tiles on the glue in toilets, utility room and storeroom. I class tiles shall be installed in bond joint at the author’s choice. The base must be previously prepared and tiling shall be performed flush. Tiles joints shall be pointed in the color of the author’s choice. The price includes all necessary labour and material, all unnecessarily damaged tiles will be charged to the Contractor through the minutes of the Supervision. Calculation per sqm of tiling.				
	utility and storeroom	m2	20.75		
	toilets	m2	118.80		
11.3.	Material supply and installation of floor granite anti-slip tiles R10 on the glue in the corridors, stairs and entry landings. I class tiles shall be installed in bond joint at the author’s choice. The base must be previously prepared and tiling shall be performed flush. Tiles joints shall be pointed in the color of the author’s choice. Plinth shall be constructed, 10cm high, which is covered by the price. The price includes all necessary labour and material, all unnecessarily damaged tiles will be charged to the Contractor through the minutes of the Supervision. Calculation per sqm of tiling.				
	corridors	m2	605.00		

11.4.	Material supply and installation of floor granite anti-slip tiles R10 on cement mortar on stairs. I class tiles shall be installed in bond joint at the author's choice. The base must be previously prepared and tiling shall be performed flush. Tiles joints shall be pointed in the color of the author's choice. Plinth shall be constructed, 10cm high, which is covered by the price. Anti-slip strips shall be placed on the landing edges. The price includes all necessary labour and material, all unnecessarily damaged tiles will be charged to the Contractor through the minutes of the Supervision. Calculation per sqm of tiling.				
		m2	31.00		
	TOTAL TILING WORKS:				
	XII PLASTERBOARDS				
12.1.	Material supply and construction of suspended ceiling made moisture-proof plasterboards, similar to "Rigips" system, in toilets and basement. Ceiling structure made of UD and CD sections, the distance between sections according to manufacturer's instructions. Ceiling is suspended on the existing ceiling. Ceiling coverings are single plasterboards, thickness d=12.5mm, with joints pointing and mesh in accordance with the manufacturer's instructions. Suspended ceiling shall be placed at the height in accordance with the design drawings and details. Calculation per sqm.				
a	toilets	m2	65.00		
b	basement	m2	160.00		
c			74.35		
12.2.	Material supply and construction of suspended ceiling made plasterboards, similar to "Rigips" system, in basement. Ceiling structure made of UD and CD sections, the distance between sections according to manufacturer's instructions. Ceiling is suspended on the existing ceiling. Ceiling coverings are single plasterboards, thickness d=12.5mm, with joints pointing and mesh in accordance with the manufacturer's instructions. Suspended ceiling shall be placed at the height in accordance with the design drawings and details. Calculation per sqm.				
a	ceiling	m2	2,871.44		
b	jambs up to 25cm	m	410.00		
12.3.	Material supply and installation of ceiling inspection opening with steel lockable cover, similar to manufacturer "B+M ritam", dim.40cmx40cm with click-clack opening system. Calculation per piece.	pcs.	17.00		
	TOTAL PLASTERBOARDS:				
	XIII PAINTING				
13.1.	Material supply and troweling of thoroughly plastered walls of classrooms, corridors, offices and other ancillary rooms. Surfaces shall be ground, cleaned and neutralized. All small damages and cracks shall be reviewed and filled with putty. Waterproofing shall be performed and coated by dispersing putty three times. Calculation per sqm of trowelled wall surfaces.				
		m2	5,507.24		
13.2.	Material supply and troweling of plaster-board ceilings on the ground floor and in basement by dispersing putty. Surfaces shall be ground, cleaned and neutralized. All small damages and cracks shall be reviewed and filled with putty. Waterproofing shall be performed and coated by dispersing putty three times. Calculation per sqm of trowelled ceiling surfaces .				
a	basement ceiling	m2	160.00		
b	ceiling	m2	2,945.79		

c	jambs up to 25cm	m	410.00		
13.3.	Material supply and painting of trowelled and plastered walls by dispersion paints, similar to type “Jupol Gold” in colour shade at the designer’s choice. Calculation per sqm of painted surface.				
		m2	4,784.73		
13.4.	Material supply and painting of trowelled ceilings by semi-dispersion paints, at the designer’s choice, in two coats. Calculation per sqm of painted surface.				
a	basement ceiling	m2	160.00		
b	ceiling	m2	2,945.79		
c	jambs up to 25cm	m	410.00		
13.5.	Material supply and painting of boiler room, corridor walls and dentis room by oil semi-matte paint, similar to type "Jupol Latex Semi-Gloss" in colour shade at the designer’s choice, up to height of 1.5m. The walls shall be pre-painted and adjusted by tinted dispersion putty, and then painted with oil paint chosen by the author, both first and second time. Calculation per sqm of painted surface.				
		m2	722.51		
13.6.	Painting of ribbed ceiling in the gymnasium by paint for concrete. Choice of color quality must correspond to application conditions as evidenced by the appropriate certificates. Paint shade as chosen by the designer. The works shall be carried out in line with the general description and all necessary preparatory works, and paint shall be applied as many times as necessary to achieve uniformity of shade. Unit price includes travelling scaffolding for safe work at height (6-9m). Calculation per sqm of surface of gymnasium ceiling horizontal projection.				
		m2	183.82		
	TOTAL PAINTING:				
	XIV SUNDRIES				
14.1.	Cleaning and disinfection of sludge as a result of flooding in the basement rooms, including sludge removal to the city landfill up to 15km of distance. Calculation per sqm of basement gross area.				
		m2	187.17		
	TOTAL SUNDRIES:				
	XV FIREPROOFING				
15.1	**Supply of portable fire extinguishers, type S-9**	pcs	14		
	TOTAL FRP:				
ZBIRNA REKAPITULACIJA GRAĐEVINSKIH I GRAĐEVINSKO-ZANATSKIH RADOVA					
A.	**CIVIL WORKS**				
I	**PRELIMINARY WORKS**				
II	**EARTHWORKS**				
III	**CONCRETE AND REINFORCED-CONCRETE WORKS**				
IV	**REINFORCING WORKS**				
V	**MASONRY**				
VI	**INSULATION WORKS**				
	TOTAL CIVIL WORKS:				
B.	**SPECIALIST'S WORKS**				
VII	**ALUMINIUM JOINERY**				
VIII	**PVC JOINERY**				
IX	**METAL WORK**				
X	**FLOORING WORKS**				
XI	**TILING WORKS**				
XII	**PLASTERBOARDS**				
XIII	**PAINTING**				
XIV	**SUNDRIES**				
XV	**FRP TOTAL:**				
	TOTAL SPECIALIST'S WORKS:				
	TOTAL CIVIL AND SPECIALIST'S WORKS :				

II ESTIMATED BILL OF QUANTITIES OF SPECIALIST'S WORKS

PROJECT: Reconstruction of High School in Obrenovac
INVESTOR: Republic of Serbia. High school in Obrenovac

ANEX ROOF

A.	**CIVIL WORKS**				
	I PREPARATION AND DEMOLITION	UoM	QUANTITY	UNIT PRICE	TOTAL
1.1.	Erection and dismantling of metal scaffolding for facade, according to the applicable HSE regulations and measures. Scaffolding must be statically stable, anchored to the building and properly grounded. Platform made of planks shall be installed at each 2.00m of height. On the outer side of the platforms, planks shall be laid as shiners. The entire surface of scaffolding shall be covered by jute or PVC curtains. Structural Engineer shall receive scaffolding and provide permission for its use by making records in the Construction log. Scaffolding is used during construction period. Calculation per m2 of vertical projection of the erected scaffolding.	m2	100.00		
1.2.	Site shall be cleaned several times from construction debris during the construction period, including transport of debris to the site landfill. Payable once regardless of the number of cleaning. Calculation per m2 of site.				
	-roof	m2	540.00		
1.3.	Dismantling of 16 downpipes from the building. Transport of downpipes to the city landfill. Calculation per meter of removed downpipe	m	54.00		
1.4.	Dismantling of windowsills and flashings from the facade RŠ 33cm. Flashings shall be removed, loaded to trucks and transported to the city landfill. Calculation per meter of removed flashing.	m	100.00		
1.5.	Dismantling of welts from roof parapet, developed width 42cm. Welts shall be removed, loaded to trucks, transported to the city landfill. Calculation per meter of removed welt	m	111.00		
1.6.	Dismantling of roofing made of flat felt sheet from the school annex. Sheet shall be removed, loaded to trucks and transported to the city landfill. Calculation per m2 of roof surface.	m2	515.00		

1.7.	Dismantling of light wooden roof truss above the building annex. The wooden structure is made of wooden beams, scantlings and planks, including horizontal undressed timber d=2.5 cm. Material shall be removed, loaded to trucks and transported to the city landfill. Calculation per m2 of the roof horizontal projection.	m2	515.00		
1.8.	Removal of flat roof layers down to the slab, in accordance with drawings: finish layer made of bitumen, loading coat made of lean concrete d=4-15 cm and Tarolit d=5 cm, i.e. polyurethane d=15 cm. Debris and other removed material shall be loaded to trucks and transported to the city landfill. Calculation per m2 of roof surface.	m2	515.00		
1.9.	Dismantling of tin chimney caps with steel substructure. Calculation per piece of chimney.	pcs	2.00		
1.10.	Removal of sewer ventilation above roof level, complete with ventilation caps. Calculation per piece.	pcs	6.00		
	TOTAL PREPARATION AND DEMOLITION:				
	II MASONRY				
2.1.	Material supply and construction of two-fraction (ratio between fractions of sand 1 and sand 2 80:20%) of cement screed with slope, ratio 1:3, which is poured as a base for flat roof finish, min. d=5cm to 24cm. Screed shall be constructed with the addition of polypropylene fibers, fibrin, which improve the mechanical properties. Fiber dosage according to the manufacturer's specifications. Screed shall be reinforced by reinforcing mesh Q188. A power trowel shall be used for screed finish. Calculation per sqm.				
	- flat roof	m2	515.00		
	TOTAL MASONRY:				
	III INSULATION WORKS				
3.1.	Material supply and installation of PE foil on the flat roof above thermal insulation but beneath cement screed.				
	TOTAL:	m2	515.00		
3.2.	Material supply and installation of vapor barrier under the roof thermal insulation and over the existing slab. Bitumenous strip with aluminum foil shall serve as vapour barrier, similar to type IZOTEKT Al V4, over a cold bituminous coating similar to type IBITOL. Calculation per m2.				
	TOTAL:	m2	515.00		
3.3.	Material supply and installation of thermal insulation of flat roof in the form of very hard rock mineral wool, density of 150kg/m3, D=20 cm, similar to type KNAUF DDP-RT. Calculation per m2.				

	D= 20 cm	m2	515.00		
3.4.	Supply and installation of "styrodur" plates, similar to type Austrotherm XPS 30 on the building's parapet. Plates shall be placed on walls by adhesive and plugs, according to the design. Calculation per m2 of installed plate.				
	D= 5cm parapet	m2	65.00		
3.5.	Material supply and installation of TPO outlet with protrusion through roof parapet, type inlet of TPO membrane into the gutter on the flat roof of the annex, with elements which are welded to TPO membrane (strips of silicon processing) and thus enable waterproof joint, all in accordance with the manufacturer's instructions. The price includes all preparations and connecting material according to the manufacturer's instructions. Diameter of pipe that goes into the gutter is Ø110mm. Calculation per piece.				
		pcs	5.00		
	TOTAL INSULATION WORKS:				
B.	**SPECIALIST'S WORKS**				
	IV METAL SHEET WORKS				
4.1.	Supply, fabrication and installation of downpipes made of galvanized steel, powder-coated sheet, width of 50 cm, cross-section of 12 x 12 cm, thickness d=0.6 mm. Downpipe ends with elbow that allows rainwater spilling freely on the ground. Connecting material shall be type, as offered by the manufacturer. Powder-coating in the color chosen by the designer. Calculation per meter.				
	-developed width=50 cm, downpipes	m	45.00		
4.2.	Supply, fabrication and flashing of roof parapets by galvanized, steel, powder-coated sheet metal thickness of 0.6 mm, developed width 50cm. Sheet shall be placed on the parapet with inclination of 3%. Calculation per meter.				
	-developed width= 50 cm, parapet flashing	m	111.00		
4.3.	Material supply, fabrication and flashing of window sills and overhang on façade by powder-coated galvanized sheet d=0,60mm, developed width of 33 cm. Price includes all necessary preparatory works and material, fixing for under-window section by screw, polyurethane adhesive and construction of drip. Window sill shall be carried out with inclination from the window with drip 2 cm from the façade plane, according to details from architectural design. Calculation per meter.				
		m	100.00		

4.4.	Material supply, fabrication and installation of metal sheet chimney caps on existing chimneys 80x40cm, made of galvanized steel sheet d=1mm. Substructure shall be performed with steel galvanized flat steel bars 50x10mm. Caps shall be carried out according to existing ones that are dismantled. Calculation per piece.				
		pcs	2.00		
4.5.	Material supply, fabrication and installation of leaf strainer for gutter on downpipes of the annex, where pipe shall be placed from flat roof drain. Leaf strainer shall be made of powder-coated galvanized sheet d=0.6 mm. Leaf strainer dim.40x30x30cm. Price includes all necessary elements for fabrication and installation. Calculation per piece	pcs	5.00		
	TOTAL METAL SHEET WORKS:				
	V ROOFING				
5.1.	Material supply and installation of geotextile 300g/m2 between TPO membrane and loading coat on flat roofs. Calculation per m2.				
		m2	585.00		
5.2.	Material supply and covering flat roofs with TPO membrane 1.5mm, similar to type FATRA. Membrane shall be placed over the geotextile and fixed to RC slab by bolts, similar to type EJOT, welded at the joints with gutters and the drip over type powder-coated sheet metal molding (which is covered by a separate item), all in accordance with the manufacturer's instructions. At joints with vertical parapet surfaces, membrane shall be raised in full height of parapet, rolled up under the sheet drip, and placed on type powder-coated sheet molding for welding, then welded, grouted with silicone, all in accordance with the manufacturer's instructions. The price includes all fasteners according to manufacturer's instructions. Geotextile is covered by a separate item. Calculation per m2.				
		m2	585.00		
5.3.	Material supply and finish around the penetrations of chimney and ventilation ducts on the roof of the building, by applying TPO membrane on vertical surfaces. TPO membrane shall be raised along chimney channels to a height of 50cm from the roof level, type powder-coated sheet metal moulding shall be placed, to which the membrane is welded, grouted with silicone, all in accordance with the manufacturer's instructions. The price includes all fasteners according to manufacturer's instructions. Calculation per meter.				
		m	8.00		

5.4.	Material supply and installation of the type powder-coated sheet molding for welding TPO membrane on vertical and horizontal surfaces (parapet walls, flashings on the roof edges). The price includes all fasteners according to manufacturer's instructions. Joints shall be grouted with polyurethane silicone, all in accordance with the manufacturer's instructions. Calculation per meter of installed molding.				
		m	100.00		
	TOTAL ROOFING:				
ZBIRNA REKAPITULACIJA GRAĐEVINSKIH I GRAĐEVINSKO-ZANATSKIH RADOVA					
A.	**CIVIL WORKS**				
I	**PRELIMINARY WORKS**				
II	**MASONRY**				
III	**INSULATION WORKS**				
	TOTAL CIVIL WORKS:				
B.	**SPECIALIST'S WORKS**				
IV	**SHEET METAL WORKS**				
V	**ROOFING**				
	TOTAL SPECIALIST'S WORKS:				
	TOTAL CIVIL AND SPECIALIST'S WORKS ROOF OF THE ANEX:				

III. HYDROTECHNICAL INSTALLATION

I. INTERNAL W&S INSTALLATIONS ON GROUND FLOOR.

A. DISMANTLING AND DEMOLITION

		UoM	quantity		unit price		TOTAL
1	Dismantling of existing sanitary Dismantle the existing sanitary devices, including waste removal to the landfill. At the same time, dismantle water supply pipes and valves, and sewer-related pipes. All damage to floors and walls shall be remedied, plastered and prepared for finishing (painting of wall or floor surface). Lump sum calculation per sanitary device or installation.						
	wash basin with mirror	pcs.	35.00	x		=	
	WC pan	pcs.	25.00	x		=	
	combined hand washer - "trokadero"	pcs.	1.00	x		=	
	shower bath	pcs.	5.00	x		=	
	PVC sewage (plumb lines)	pcs.	11.00	x		=	
	galvanized steel pipes (plumb lines)	pcs.	11.00	x		=	
	electrical boiler	pcs.	7.00	x		=	
	urinal	pcs.	16.00	x		=	
	floor gully	pcs.	12.00	x		=	
	kitchen sink	pcs.	1.00	x		=	
	chemistry classroom cabinet	pcs.	1.00	x		=	
					TOTAL A.		

B. WATER SUPPLY

1.	PP pipes for cold water: Supply and installation of water supply PP pipes, SDR11 class, with all necessary accessories and fitting. The price includes all the works related to this item, creating openings in the floor structure and closure after installation of pipes, wall chiseling and repair after pipes installation. The pipes in floor on the ground floor (chemistry classroom) are placed in the same channel with sewage pipes						
a .	Free-standing pipes Freestanding pipes are attached to the structure by clips with rubber, according to the manufacturer's instructions, included by the price.						
	Ø 75 mm (2.1/2")	m	12.00	x		=	
	Ø 63 mm (2")	m	24.00	x		=	
	Ø 50 mm (6/4")	m	45.00	x		=	

Ø 40 mm (5/4")	m	22.00	x		=
Ø 32 mm (1")	m	24.00	x		=
Ø 25 mm (3/4")	m	7.00	x		=
Ø 20 mm (1/2")	m	11.00	x		=

b . Built-in pipes

Built-in pipes are fixed in chiseled channels, according to the manufacturer's instructions, included by the price.

Ø 32 mm (1")	m	15.00	x		=
Ø 25 mm (3/4")	m	44.00	x		=
Ø 20 mm (1/2")	m	172.00	x		=

2. PP pipes for hot water:

Supply and installation of PP pipes for hot water, SDR7.4 class, thermally stabilized (composite) with all necessary fittings and accessories. The price includes all the works related to this item, including making openings in the floor structure and closure after installation of pipes, wall chiseling and repair after pipe installation.

a . Free-standing pipes

Freestanding pipes are attached to the structure by clips with rubber, according to the manufacturer's instructions, included by the price.

Ø 40 mm (5/4")	m	5.00	x		=
Ø 25 mm (3/4")	m	5.00	x		=

b . Built-in pipes

Built-in pipes are fixed in chiseled channels, according to the manufacturer's instructions, included by the price.

Ø 32 mm (1")	m	3.00	x		=
Ø 25 mm (3/4")	m	13.00	x		=
Ø 20 mm (1/2")	m	71.00	x		=

3. Thermal insulation of pipes:

Supply and installation of pipe thermal insulation, conductivity L=0.040 W/(mK) Armaflex - Tubolit or of similar or same characteristics with all necessary accessories.

a . Cold water pipes and hot water built-in pipes

22 x 4 (1/2")	m	254.00	x		=
28 x 4 (3/4")	m	64.00	x		=
35 x 4 (1")	m	42.00	x		=
42 x 4 (5/4")	m	22.00	x		=
54 x 4 (6/4")	m	45.00	x		=
64 x 4 (2")	m	24.00	x		=
76 x 4 (2.1/2")	m	12.00	x		=

b . Hot water free-standing pipes

28 x 13 (3/4")	m	5.00	x		=

	42 x 13 (5/4")	m	5.00	x	=	
4.	Gate valves: Supply and installation of gate valves with chrome cap and rosette and all necessary accessories.					
	DN 25 mm	pcs.	4.00	x	=	
	DN 20 mm	pcs.	8.00	x	=	
	DN 15 mm	pcs.	40.00	x	=	
5.	Ball valves: Supply and installation of ball valve with plumb lines, including all necessary accessories and fitting.					
	DN 65 mm	pcs.	2.00	x	=	
	DN 50 mm	pcs.	3.00	x	=	
	DN 40 mm	pcs.	3.00	x	=	
	DN 32 mm	pcs.	3.00	x	=	
6.	EK valves: Supply and installation of EK valves including all necessary accessories.					
	DN 15 mm	pcs.	83.00	x	=	
7.	Testing of water supply system: Hydraulic testing of the water supply system in line with the design, including report preparation.					
		m	473.00	x	=	
8.	Disinfection and flushing of water supply system: The performed water supply system shall be disinfected according to technical regulations, and piping shall be flushed and quality tested in certified laboratories.					
	Lump sum calculation	LS	1.00	x	=	
					TOTAL B.	

C. SEWAGE

1.	PVC pipes: Supply and installation of PVC sewage pipes with all necessary fittings and accessories. Pipes are connected by rubber bands. Inspection eye shall be placed at the bottom of plumb lines. The price includes all the works related to this item including making openings in the floor structure and their closure after installation of pipes, wall chiseling and repair after pipes are installed.					
a .	Pipes inside floor in chemistry classroom					

Pipes are placed in the excavated channel in the floor of the facility. The price includes floor, floor cutting, floor structure demolition, channel excavation and backfilling with sand up to the lower level of floor structure. Flooring is covered by civil portion of

Ø 110 mm	m	4.00	x	=
Ø 75 mm	m	12.00	x	=

b . Rising stack

Rising stacks are free-standing, attached to the structure beneath each socket, with inspection eye at the bottom and protrusion above the roof structure which is included in the price.

Ø 110 mm	m	63.00	x	=
Ø 75 mm	m	74.00	x	=

c . Sewage distribution

Sewage distribution is performed in floor and wall, including all necessary recess cutting, excavation, sand and pipe fastening.

Ø 150 mm	m	4.00	x	=
Ø 110 mm	m	69.00	x	=
Ø 75 mm	m	25.00	x	=
Ø 50 mm	m	129.00	x	=

2. Gully:

Supply and installation of gully with waterless trap (odour trap), with chrome grille class K3 and side connection Ø 50 mm.

Ø 75 mm	pcs.	3.00	x	=
Ø 50 mm	pcs.	16.00	x	=

3. Ventilation:

Supply and installation of PVC vent cap with flashing around roof plane penetration.

Ø 150 mm	pcs.	7.00	x	=
Ø 125 mm	pcs.	8.00	x	=

4. Pipe penetration through walls and slabs:

Pipe penetration through walls and slabs includes breaking and chiselling of walls and floors and floor slabs, and reinstatement once installations are completed. The price includes all works on breaking, chiselling, re-plastering, re-tiling and painting of walls and ceiling, and insulation repair. Lump sum calculation per penetration.

foundation wall	pcs.	9.00	x	=
wall	pcs.	22.00	x	=
floor slab	pcs.	43.00	x	=

5. Sludgers:
Supply and installation of single-sludge pumps, submerged for pumping rainwater and slightly contaminated effluent with suction height of less than 20 mm. The pumps are designed for mobile operation. The motor has dry-running and overload protection and is fitted with automatic float switch. The price covers the discharge pipe PP Ø 40 mm (5/4") of up to 6 m long with a connection to FŠ 9.
Pedrollo TP 2 or of similar features: Q = 1.0 l/s; H = 6.0 m; P = 370 W

pcs.	1.00	x		=

6. Testing of sewage system:
Testing of the sewage system in line with the design, including report preparation.

m	243.00	x		=

TOTAL C.

D. SANITARY DEVICES

1. WC pan:
Supply and installation of WC pan, shape and colour as chosen by the designer, comprising:
-ceramic WC pan of I class, 6 liters flush, with the seat and lid;
-low noise concealed cistern with dual savings (6/3l) flush button, with angle valve for water connection Ø15, low noise filling valve;
-drain elbow Ø90/110mm with soundproof clip, connecting piece for WC pan with sealing cuffs and a set of sound insulation, screws for fixing ceramicware and all necessary accessories according to the manufacturer's instructions.

standard one	pcs.	27.00	x	=
for disabled persons	pcs.	2.00	x	=

3. Wash basin:
Supply and installation of wash basin made of faience with a stand, trap and all necessary material for its installation.

standard one	pcs.	42.00	x	=
for disabled persons	pcs.	2.00	x	=

4. Wash basin tap:

	Supply and installation of lever tap, push, self-closing, antivandal tap for wash basin, combined for hot and cold water, wash basin mounted. The price includes flex pipes for connection to water supply system.				
		pcs.	28.00	x	=
5.	Bathtub:				
	Supply and installation of steel bathtub, including all necessary accessories for connection to sewage system, i.e. drain and overflow pipe with horizontal trap.				
	dim. 90 x 90 cm - upstand tray	pcs.	5.00	x	=
6.	Bathtub tap:				
	Supply and installation of lever tap, wall-mounted, combined for hot and cold water, wall-mounted shower, including all necessary material for				
		pcs.	5.00	x	=
7.	Electrical boiler:				
	Supply and installation of electrical boiler, including equipment and connection to water and power supply.				
	floor-standing boiler V = 350 lit; P = 6.0 kW	pcs.	1.00	x	=
	expansion vessel 25 l/10 bar	pcs.	1.00	x	=
	non-return valve Ø 32 mm	pcs.	1.00	x	=
	safety valve Ø 25 mm	pcs.	1.00	x	=
8.	Electrical boiler:				
	Supply and installation of electrical boiler, including connection to water and power supply.				
	V = 50 l - horizontal	pcs.	1.00	x	=
	V = 30 l - horizontal	pcs.	4.00	x	=
	V = 10 l - horizontal	pcs.	1.00	x	=
9.	Single-point heater:				
	Supply and installation of single-point heater, with combined standing tap for hot and cold water for wash basin with three pipes.				
	V = 5 l - under vanity	pcs.	16.00	x	=
10.	Sink:				
	Supply and installation of single-bowl sink with trap and all necessary connecting material.				
		pcs.	1.00	x	=
11.	Sink tap:				

Supply and installation of lever tap, combined for hot and cold water, sink-mounted. The price includes flex pipes for connection to water supply system.	pcs.	1.00	x		=
12. Combined handwasher: Supply and installation of combined handwasher made of faience, including stainless steel grid, low noise and low-mounted cistern with flushing pipe and all necessary connecting material and connection to water supply and sewage.	pcs.	2.00	x		=
13. Urinal: Supply and installation of wall-mounted urinal made of faience with trap and all necessary connecting material and connection to water supply and sewage.	pcs.	7.00	x		=
14. Urinal flusher: Supply and installation of push, self-closing, antivandal urinal flusher with connection to water supply.	pcs.	7.00	x		=
15. Tap in chemistry classroom: Installation of nickel-plated, standing tap in chemistry classroom, including all necessary connecting and sealing material.	pcs.	14.00	x		=
16. Sanitary ware: Supply and installation of sanitary ware:					
mirror with frame 50x40cm	pcs.	44.00	x		=
hand paper holder	pcs.	44.00	x		=
soap dispenser	pcs.	44.00	x		=
toilet paper holder	pcs.	29.00	x		=
TOTAL D.					

I. SUMMARY OF INTERNAL W&S INSTALLATIONS.

A. EARTHWORKS
B. WATER SUPPLY
C. SEWAGE
D. SANITARY DEVICES

TOTAL I:

II. EXTERNAL W&S INSTALLATIONS.

NOTE:

Sanitary water external distribution pipes are placed in the same trench with external hydrant network at a distance of at least 40 cm. Section I – ESTIMATED BILL OF QUANTITIES OF HYDRANT NETWORK includes the connection to the public water supply system, water measuring manhole with water meters and all preliminary, earthworks and concrete works.

A. PRELIMINARY WORKS

1. Surveying:
   Setting out the water supply routes, including surveying of longitudinal and transverse sections, and protection of marked areas.

   m 140.00 x =

2. Setting out existing installations:
   Setting out existing installations (telecommunications, electrical installations, water supply, sewage, etc.) by competent companies. This item includes hand digging of trial grip trenches where water supply route crosses the underground installations, including their setting out.

   pcs. 12.00 x =

3. Maintenance, relocation and repair of existing installations:
   Repair and relocation of existing damaged underground utilities (water, sewer, telephone, etc.), as well as protection of overhead telephone and electric poles.
   Lump sum calculation LS 1.00

4.	Site protection: Providing the site with horizontal, vertical and light signalization during construction works including design development, equipment supply and maintenance. The price includes the regular cleaning of public roads from earth that falls from trucks and construction machinery, as well as installation of hoarding and signalization at the edge of the	m	140.00	x		=
5.	Cleaning and flushing of existing sewage: Clean and flush the existing sewage connection ACC Ø 250 m by a special vehicle to enable its full functionality. The price includes closing of FŠP2 sewage entry, which is cancelled in line with the design.	m	80.00	x		=
	TOTAL A.					
B.	DISMANTLING AND DEMOLITION					
1.	Dismantling and demolition of the existing sewage manhole: Cover and frame of the existing sewage manhole shall be dismantled, including transport to landfill. The manhole shall be then demolished and debris removed to the landfill, while the hole shall be filled with soil from sewage excavation. Lump sum calculation per manhole piece	pcs.	3.00	x		=
	TOTAL B.					
C.	EARTHWORKS					
1.	Mechanical excavation: Trench excavation for laying sewer pipes and manholes. During the excavation, soil shall be immediately loaded to trucks. Excavation depth and channel width are in line with designed elevations.	m^3	84.50	x		=
2.	Hand digging:					

	Trench digging for laying sewer pipes and manholes. Hand digging shall be carefully performed so as not to damage the existing underground installations.				
		m^3	197.30	x	=
3.	Sand: Supply, transport and placement of medium sand in the trench. First, a layer of 10 cm is placed, pipes are laid, and then sand is placed and compacted around and above pipes in a layer of 10 cm.				
		m^3	75.90	x	=
4.	Backfilling: Trench backfilling in layers of 30 cm with compacting until reaching full compactness. Material must be free from stones				
	excavated soil	m^3	155.90	x	=
	gravel or grit	m^3	34.20	x	=
5.	Haul: Unused material from mechanical trench excavation shall be hauled to the landfill up to 5 km of distance and roughly spread. The unit price includes transport and spreading.				
		m^3	125.90	x	=
	TOTAL C.				

D. CONCRETE WORKS

1.	Asphalt and concrete surfaces: Mechanical two-sided cutting of asphalt and concrete pavements, plateaus and sidewalks, and breaking, loading and transport of materials to the landfills. After installations are placed and backfilled, crushed stone bedding shall be constructed d=20 cm with the necessary compaction under SRPS standard. Finally, pavement shall be covered by asphalt (BNS 22C or BNS 32C made of bituminous aggregate in a layer d=12 cm) or plateau and sidewalks shall be concreted (plain concrete MB 15, d=20 cm).				
		m^2	50.00	x	=
2.	Gravel base:				

	Supply, transport, spreading, planning and compacting of gravel, natural grain-size in a layer of 10cm in stable condition beneath the manhole slab and polymer-concrete channels.				
		m^3	1.70	x	=
3.	Sewage manhole - round: Supply and construction of manholes made of prefabricated concrete rings Ø100 cm with conical end Ø 100/60 cm. The first ring is placed on a concrete slab d=15 cm, finished as channel. All joints shall be finished as watertight. Price includes construction of manholes, including concreting of RC ring for supporting manhole cover, all in line with design details.				
		m	18.50	x	=
4.	Sewage manhole - square: Supply and construction of manholes made of concrete, clearing opening 60/60 cm. Manhole shall be placed on concrete slab d = 15 cm, finished as channel. All joints shall be finished as watertight. The price includes construction of manhole according to the design.				
		m	2.30	x	=
5.	Connection to existing sewage: Making of connection to the existing storm sewer manhole. The connection is made by creating an opening in manhole and working up the pipe penetration through the manhole. Calculation per piece of completely finished work.				
		pcs.	2.00	x	=
	TOTAL D.				

E. INSTALLATION - WATER SUPPLY

1.	PE pipes: Supply, transport and installation of polyethylene pipes for water supply. Pipes shall be connected by welding.				
	Ø 90 x 10	m	24.00	x	=
	Ø 75 x 10	m	106.00	x	=
	Ø 63 x 10	m	4.00	x	=
2.	Flanged couplings:				

	Supply and installation of flanged couplings, including all necessary connecting and sealing material.				
	Ø 90	pcs.	4.00	x	=
	Ø 75	pcs.	2.00	x	=
	Ø 63	pcs.	2.00	x	=
3.	Ductile iron fittings:				
	Supply, transport and installation of ductile iron fittings under SRPS C.J.022 and ISO/P.13. The price includes all necessary connecting and sealing material.				
	OP (T) Ø 80/50	pcs.	1.00	x	=
	LP4 (FFK) Ø 80	pcs.	1.00	x	=
4.	Testing of water supply system:				
	Testing of water supply system as designed, including preparation of a report.				
		m	134.00	x	=
	Desinfection and flushing of water supply system:				
	Disinfection of the constructed water supply network, in line with technical regulations, and flushing of pipelines, and quality testing by certified laboratories.				
	Lump sum calculation	LS	1.00		
	TOTAL E.				

F. INSTALLATION - SEWAGE

1.	PVC sewage pipes:				
	Supply and installation of PVC sewage pipes under SRPS EN 1401, including all necessary connecting material in line with the design. Pipes shall be connected by rubber rings.				
	Ø 200 mm - SN4	m	140.00	x	=
	Ø 150 mm - SN4	m	100.00	x	=
	Ø 100 mm - SN2	m	31.00	x	=
2.	PVC penetration through manhole:				
	Supply and installation of PVC penetrations through manhole (KGF) comprising PVC ring made of adequate section, 110 mm long, with rubber seal. Ring shall be installed as watertight in the manhole wall and shall enable the passage of connection.				
	Ø 200 mm	pcs.	14.00	x	=
	Ø 150 mm	pcs.	19.00	x	=
	Ø 100 mm	pcs.	9.00	x	=

3.	Ductile iron covers: Supply, transport and installation of ductile iron covers with frame, including adequate anchoring in concrete. Covers shall be constructed under SRPS CJ1.600.				
	D 400 class	pcs.	3.00	x	=
	B 125 class	pcs.	11.00	x	=
4.	Ductile iron covers: Supply and installation of ductile iron covers with frame, square 60/60 cm, weighing 24 kg, load 50 KN on sewage manhole.				
		pcs.	3.00	x	=
5.	Ductile iron steps: Supply and installation ductile iron steps in manholes at 30 cm distance.				
		pcs.	40.00	x	=
	TOTAL F.				

G. OTHER WORKS

1.	Sewage network testing: Hydraulic testing of sewage network as designed. Testing is done for checking the quality of works performed. Price of testing includes the price of water for testing.				
		m	271.00	x	=
2.	Sewage network cleaning: Cleaning of the constructed sewage network in accordance with technical regulations, followed by pipeline flushing.				
		m	271.00	x	=
3.	Surveying: Surveying of constructed W&S installations for cadastral register of underground installations.				
		m	405.00	x	=
4.	As-built design: Development of As-built design according to law and regulation.				
	Lump sum calculation	LS	1.00		
	TOTAL G.				

II. SUMMARY OF EXTERNAL W&S INSTALLATIONS.

A. PRELIMINARY WORKS

DISMANTLING AND DEMOLITION

B.

C. EARTHWORKS

D. CONCRETE WORKS

E. INSTALLATION - WATER SUPPLY

F. INSTALLATION - SEWAGE

G. OTHER WORKS

TOTAL II:

III. HYDRAN NETWORK - internal and external.

A. PRELIMINARY WORKS

1. Surveying:
   Setting out the water supply routes, including surveying of longitudinal and transverse sections, and protection of marked areas.

m	333.00	x		=

2. Setting out existing installations:
   Setting out existing installations (telecommunications, electrical installations, water supply, sewage, etc.) by competent companies. This item includes hand digging of trial grip trenches where water supply route crosses the underground installations, including their setting out.

pcs.	13.00	x		=

3. Maintenance, relocation and repair of existing installations:
   Repair and relocation of existing damaged underground utilities (water, sewer, telephone, etc.), as well as protection of overhead telephone and electric poles.

Lump sum calculation	LS	1.00		

4. Site protection:
   Providing the site with horizontal, vertical and light signalization during construction works including design development, equipment supply and maintenance. The price includes the regular cleaning of public roads from earth that falls from trucks and construction machinery, as well as installation of hoarding and signalization at the edge of the

m	333.00	x		=

TOTAL A.

B. DISMANTLING AND DEMOLITION

1.	Dismantling of existing connection: Careful dismantling of the existing water supply connection in line with the requirements and under the control of the competent PUC. The price includes all works related to cleaning the area of service connection, dismantling of all connection elements, closing water supply, discharging pipeline, and subsequent opening of water supply. Lump sum calculation	LS	1.00			
2.	Dismantling and demolition of existing water measuring manhole: Dismantling of covers and all elements of the existing water meter manhole, including haul to the landfill. Demolition of the existing water meter manhole, including debris haul to the Lump sum calculation	LS	1.00			
3.	Dismantling of existing external hydrants: Excavation and dismantling of external underground hydrants and all elements, including transport to the landfill. This is followed by backfilling of the excavated hole by excavated soil. Calculation per piece of hydrant	pcs.	2.00	x		=
4.	Dismantling of existing inetrnal Recess cutting and demolition of existing internal hydrant cabinets and all elements, including transport to the landfill. This is followed by walling up opening, plastering, troweling and painting of wall for the hydrant. Calculation per piece of hydrant	pcs.	8.00	x		=
5.	Dismantling of existing hydrant network in the building: Careful dismantling of the existing hydrant network in the building, including the finish of created openings and damage on the walls and the building's structure. All materials shall be hauled to the landfill. Lump sum calculation	LS	1.00			

TOTAL B.

C. EARTHWORKS

1. Mechanical excavation:

	Trench excavation for laying water supply pipes and manholes. During the excavation, soil shall be immediately loaded to trucks. Excavation depth and channel width are in line with designed elevations.				
		m^3	110.80	x	=
2.	Hand digging: Trench digging for laying water supply pipes and equipment. Hand digging shall be carefully performed so as not to damage the existing underground installations.				
		m^3	151.10	x	=
3.	Sand: Supply, transport and placement of medium sand in the trench. First, a layer of 10 cm is placed, pipes are laid, and then sand is placed and compacted around and above pipes in a layer of 10 cm.				
		m^3	72.40	x	=
4.	Backfilling: Trench backfilling in layers of 30 cm with compacting until reaching full compactness. Material must be free from stones.				
	excavated soil	m^3	119.00	x	=
	gravel or grit	m^3	52.50	x	=
5.	Haul: Unused material from mechanical trench excavation shall be hauled to the landfill up to 5 km of distance and roughly spread. The unit price includes transport and spreading.				
		m^3	132.90	x	=
	TOTAL C.				

D. CONCRETE WORKS

1. Asphalt and concrete surfaces:

	Mechanical two-sided cutting of asphalt and concrete pavements, plateaus and sidewalks, and breaking, loading and transport of materials to the landfills. After installations are placed and backfilled, crushed stone bedding shall be constructed d=20 cm with the necessary compaction under SRPS standard. Finally, pavement shall be covered by asphalt (BNS 22C or BNS 32C made of bituminous aggregate in a layer d=12 cm) or plateau and sidewalks shall be concreted (plain concrete MB 15, d=20 cm).	m^2	111.00	x	=
2.	Gravel base: Supply, transport, spreading, planning and compacting of gravel, natural grain-size in a layer of 10cm in stable condition beneath the manhole slab.	m^3	0.50	x	=
3.	Concreting of manhole bottom slab: Concreting of manhole bottom slab, according to the design. Slab shall be made of reinforced-concrete MB30, 20 cm thick. The price includes the necessary formwork, while reinforcement shall be paid separately.	m^3	0.90	x	=
4.	Masonry of manhole walls: Masonry of manhole walls with concrete blocks on cement mortar. Vertical ring beams shall be constructed at the corners, as designed. Wall is 20 cm thick.	m^3	1.70	x	=
5.	Concreting of manhole upper slab: Concreting of manhole upper slab performed in formwork, as designed. Slab shall be reinforced-concrete, 20 cm thick, with a ring beam. The price includes the necessary formwork, while reinforcement shall be paid separately.	m^3	0.90	x	=
6.	Rebar: Supply, cutting, bending and installation of rebars, in accordance with the specification and installation				
	MAG 50/56	kg	75.00	x	=
	GA 24/36	kg	57.00	x	=

7.	Anchor blocks: Construction of anchor blocks made of plain concrete MB 20 to stabilize the piping and fittings. The price includes all necessary materials and work with formwork.				
		pcs.	25.00	x	=
	TOTAL D.				

E. INSTALLATION

1.	PE pipes: Supply, transport and installation of polyethylene pipes for water supply. Pipes shall be connected by welding				
	Ø 110 x 10	m	333.00	x	=
	Ø 90 x 10	m	10.00	x	=
	Ø 63 x 10	m	19.00	x	=
2.	Ductile iron fittings: Supply, transport and installation of ductile iron fittings under SRPS C.J.022 and ISO/P.13. The price includes all necessary connecting and sealing material.				
		kg	444.00	x	=
3.	Galvanized steel pipes: Supply and installation of galvanized steel pipes for water supply with all necessary fittings and accessories. The price includes all labor and material for fixing pipes to the building's structure.				
	Ø 65 mm (2.1/2", Ø63.5x2.9mm)	m	160.00	x	=
	Ø 50 mm (2", Ø51x2.9mm)	m	25.00	x	=
4.	PE flange adaptor extended: Supply and installation of PE flange adaptor extended for connecting pipes and fittings, including all necessary connecting and sealing material.				
	Ø 110 mm	pcs.	36.00	x	=
	Ø 90 mm	pcs.	15.00	x	=
5.	Flanged couplings: Supply and installation of flanged couplings, including all necessary connecting and sealing material.				
	Ø 63	pcs.	4.00	x	=
6.	Flexible couplings: Supply and installation of flexible couplings, type ALFA universal ili equivalent, including all necessary connecting and sealing material.				

	DN 150/160 mm	pcs.	2.00	x	=
7.	Gate valve with oval body, incl. fitting set: Supply, transport and installation of ductile iron gate valve with oval body, including fitting set (barrel, telescopic extension spindle, protective pipe and cap), and all necessary connecting and sealing material.				
	DN 100; PN 16	pcs.	1.00	x	=
	DN 80; PN 16	pcs.	1.00	x	=
	DN 50; PN 16	pcs.	2.00	x	=
8.	Valves: Supply, transport and installation of ductile iron valves, and all necessary connecting and sealing material.				
	DN 80; PN 10 - flat	pcs.	2.00	x	=
9.	Ball valves: Supply and installation of ball valves in water supply manholes, and all necessary connecting material and fittings.				
	DN 50 mm	pcs.	2.00	x	=
10.	Water meter: Supply and installation of water meter - flowmeter "Insa" Belgrade, or equivalent, including all necessary connecting and sealing material.				
	DN 80 propeller, type "Voltman" ,	pcs.	1.00	x	=
	Ø 50 mm	pcs.	1.00	x	=
11.	Drilled flange: Supply and installation of blind steel flange drilled by thread for connection of galvanized steel pipes, including all necessary connecting and sealing material.				
	Ø 80 - 2.1/2"	pcs.	1.00	x	=
12.	Ductile iron covers of water meter manhole: Supply and installation of ductile iron covers with frame, weighing 24 kg, load 50 KN on water meter manhole.				
		pcs.	1.00	x	=
13.	Overhead hydrant:				

	Supply and installation of fire overhead hydrant DN 80, as designed, including all necessary connecting material. The price includes installation of adequate hydrant cabinet HO-V and marking of hydrant spot.	pcs.	5.00	x	=
14.	Internal hydrants: Supply and installation of fire wall-mounted hydrant cabinet, as designed, including all necessary connecting material. Cabinet includes the Trevira pressure hose Ø 52, L=15 m nozzle with valve Ø 52 connecting valve Ø 2" connecting nut	pcs.	15.00	x	=
15.	Pipe penetration through walls and slabs: Water supply pipe penetration through walls and slabs includes breaking and chiselling of walls and floors and floor slabs, and reinstatement once installations are completed. The price includes all works on breaking, chiselling, re-plastering, re-tiling and painting of walls and ceiling, and insulation repair. Lump sum calculation per penetration.				
	foundation wall	pcs.	2.00	x	=
	wall	pcs.	9.00	x	=
	mezzanine slab	pcs.	7.00	x	=
	floor slab	pcs.	2.00	x	=
	TOTAL E.				

F. OTHER WORKS

1.	Testing: Hydraulic testing of network as designed. Testing is done for checking the quality of works performed. Price of testing includes the price of water for testing.	m	362.00	x	=
2.	Flushing: Flushing of performed network in line with techincal regulation.	m	362.00	x	=
3.	Surveying: Surveying of installations for cadastral register of underground installations.	m	333.00	x	=

4.	As-built design: Development of As-built design according to law and regulation Lump sum calculation	LS	1.00

TOTAL F.

III. SUMMARY OF HYDRANT NETWORK.

A. PRELIMINARY WORKS
DISMANTLING AND DEMOLITION
B.
C. EARTHWORKS
D. CONCRETE WORKS
E. INSTALLATION
F. OTHER WORKS

TOTAL III:

GRAND SUMMARY OF W&S

I. INTERNAL INSTALLATIONS ON GROUND FLOOR
II. EXTERNAL INSTALLATIONS
III. HYDRANT NETWORK

IV ESTIMATED BILL OF QUANTITIES

OF FINAL DESIGN OF ELECTRIC POWER INSTALLATIONS

Item	*Description*	*UoM*	*Quant.*	*unit price*	*Total*

GENERAL REMARKS

This Bill of Quantities provides for the delivery of any material specified by the items and any small unspecified material required for a complete construction, installation as defined by the individual items, testing and commissioning, as well as remedy of all damaged areas of already executed works and structures.
All material used must be of first class quality and conform to the standards. All works must be performed by qualified labour, and fully according to the technical regulations applicable to the respective works.

The price is includes the cost of materials specified by items, cost of unspecified material, and labour cost (excluding VAT). Price includes preparation of all necessary shop documentation, testing and commissioning of all installation elements listed in the items.
Specified types and manufacturers of certain equipment or installation materials are not mandatory. The contractor may install any other equipment, or material, provided that it has the same electrical and structural characteristics mentioned, which shall be previously confirmed and certified by a qualified person- the Supervision.

1. CABLES AND PIPES

1.1.	Supply and laying of cables with copper conductors, XLPE insulation and low-smoke, halogen-free, polyolefin-based sheath for lighting installations and sockets. Cables are laid in the wall or directly on the wall or ceiling beneath wall claddings or suspended ceiling, smaller portion goes to conduits, including branching and connections, required number of junction boxes, conduit boxes				
-	N2XH-J 3x1,5 mm^2	m	2,820		
-	N2XH-J 4x1,5 mm^2	m	460		
-	N2XH-J 3x2,5 mm^2	m	7,350		
-	N2XH-J 5x2,5 mm^2	m	310		
-	N2XH-J 5x4 mm^2	m	47		
-	N2XH-J 5x6 mm^2	m	323		
-	N2XH-J 5x10 mm^2	m	98		
-	N2XH-J 5x16 mm^2	m	72		
-	N2XH-J 4x70 mm^2	m	34		
-	N2XH-J 4x(1x70) mm^2	m	3		
-	N2XH-J 1x50 mm^2	m	2		

1.2.	Supply and laying of corrugated or smooth conduits in the walls and floors made of halogen-free elements, on the forms before casting concrete, in recessed channel through brick or plaster wall, having the following dimensions:				
-	fi 16 mm	m	2,800		
-	fi 23 mm	m	400		
-	"Sapa" metal conduit fi 70	m	35		

1.3.	Perforated cable tray, zinc-coated, complete with straight, angular, branched and cross-shaped elements, connectors, holders mounted on every 1 m, brackets and any other element necessary to perform a complete configuration of the tray, of width:				
-	PNK 200 mm	m	365		

TOTAL 1

Item	Description	UoM	Quant.	unit price	Total

2. DISTRIBUTION CABINET AND SUPPLY CABLES

2.1.	Delivery and installation of measuring distribution cabinet. The cabinet is made according to the conditions stipulated by Electric Power Distribution company with a lock and key. The cabinet shall be installed and connected to the following equipment: - 1 piece of multifunctional power meter with semidirect measuring 5(6)A-three-phase electric power meter of active power, with max.15 min load indicator, accuracy class 1, three-phase electric power meter of reactive power, accuracy class 3, centralized network control receiver with dual tariff contacts, maximum level indicator. -3 pcs M=of measuring current transformers (CT), ratio 200/5 A/A -1 piece of measuring-junction box Copper busbars, terminal blocks, line post insulators, wiring conductors, diagrams, warning signs, name plates, and any fine material.				
		pcs	1		

Item	Description	UoM	Quant.	unit price	Total
2.2.	Delivery and installation of metal distribution cabinet, type GRO-1. The cabinet is made with mechanical protection IP 40, with lock and key. Cabinet's size is in accordance with the equipment placed inside it, so there is 30% of the reserve free space. Cabinet wiring shall be performed properly. Installed equipment shall be permanently and clearly marked. Cabinet shall be delivered with any necessary certificate of compliance for the equipment. Payment of completely delivered and installed cabinet as functional unit, with the following equipment: - 1 pcs Molded Case Circuit Breakers, 200 A with undervoltage release and mushroom push-button - 1 pcs Circuit breaker 4 A, 1p, "B" - 3 pcs Circuit breaker 6 A, 1p, "B" - 5 pcs Circuit breaker 16 A, 1p, "B" - 6 pcs Circuit breaker 32 A, 1p, "C" - 21 pcs Circuit breaker 20 A, 1p, "C" - 3 pcs Circuit breaker 25 A - 6 pcs Circuit breaker 40 A - 3 pcs Circuit breaker 50 A - 2 pcs Contactor 12A, 230V with 1M+1R auxiliary contact - 3 pcs LED signal light fi22, 230VAC, green (door-mounted) - Copper busbars, terminal blocks, line post insulators, wiring conductors, diagrams, warning signs, name plates and any fine material.				
		pcs	1		

2.3.	Delivery and installation of metal distribution cabinet, type RT 1. The cabinet is made with mechanical protection IP 40, with lock and key. Cabinet's size is in accordance with the equipment placed inside it, so there is 30% of the reserve free space. Cabinet wiring shall be performed properly. Installed equipment shall be permanently and clearly marked. Cabinet shall be delivered with any necessary certificate of compliance for the equipment. Payment of completely delivered and installed cabinet as functional unit, with the following equipment: - 1 pcs Residual Current Device -40/0,5A - 1 pcs Three-phase cam switch 40 A, 500 V, 1-0 - 3 pcs Circuit breaker 10 A, 1p, "B" - 25 pcs Circuit breaker 16 A, 1p, "B" - Copper busbars, terminal blocks, line post insulators, wiring conductors, diagrams, warning signs, name plates and any fine material.				
		pcs	1		

2.4.	Delivery and installation of metal distribution cabinet, type RT 2. The cabinet is made with mechanical protection IP 40, with lock and key. Cabinet's size is in accordance with the equipment placed inside it, so there is 30% of the reserve free space. Cabinet wiring shall be performed properly. Installed equipment shall be permanently and clearly marked. Cabinet shall be delivered with any necessary certificate of compliance for the equipment. Payment of completely delivered and installed cabinet as functional unit, with the following equipment: - 1 pcs Residual Current Device -25/0,5A - 1 pcs Three-phase cam switch 40 A, 500 V, 1-0 - 3 pcs Circuit breaker 10 A, 1p, "B" - 12 pcs Circuit breaker 16 A, 1p, "B" - Copper busbars, terminal blocks, line post insulators, wiring conductors, diagrams, warning signs, name plates and any fine material.				
		pcs	1		

2.5.	Delivery and installation of metal distribution cabinet, type RT 3. The cabinet is made with mechanical protection IP 40, with lock and key. Cabinet's size is in accordance with the equipment placed inside it, so there is 30% of the reserve free space. Cabinet wiring shall be performed properly. Installed equipment shall be permanently and clearly marked. Cabinet shall be delivered with any necessary certificate of compliance for the equipment. Payment of completely delivered and installed cabinet as functional unit, with the following equipment: - 1 pcs Residual Current Device -25/0,5A - 1 pcs Three-phase cam switch 25 A, 500 V, 1-0 - 3 pcs Circuit breaker 10 A, 1p, "B" -17 pcs Circuit breaker 16 A, 1p, "B" - Copper busbars, terminal blocks, line post insulators, wiring conductors, diagrams, warning signs, name plates and any fine material.				
		pcs	1		

Item	Description	UoM	Quant.	unit price	Total
2.6.	Delivery and installation of metal distribution cabinet, type RT 4. The cabinet is made with mechanical protection IP 65, with lock and key. Cabinet's size is in accordance with the equipment placed inside it, so there is 30% of the reserve free space. Cabinet wiring shall be performed properly. Installed equipment shall be permanently and clearly marked. Cabinet shall be delivered with any necessary certificate of compliance for the equipment. Payment of completely delivered and installed cabinet as functional unit, with the following equipment: - 1 pcs Residual Current Device -40/0,5A - 1 pcs Three-phase cam switch 40 A, 500 V, 1-0 - 1 pcs Circuit breaker 10 A, 1p, "B" - 36 pcs Circuit breaker 16 A, 1p, "B" - Copper busbars, terminal blocks, line post insulators, wiring conductors, diagrams, warning signs, name plates and any fine material.				
		pcs	1		
2.3.	Delivery and installation of metal distribution cabinet, type RT 5. The cabinet is made with mechanical protection IP 40, with lock and key. Cabinet's size is in accordance with the equipment placed inside it, so there is 30% of the reserve free space. Cabinet wiring shall be performed properly. Installed equipment shall be permanently and clearly marked. Cabinet shall be delivered with any necessary certificate of compliance for the equipment. Payment of completely delivered and installed cabinet as functional unit, with the following equipment: - 1 kom ZUDS -63/0,5A - 1 kom Tropolna grebenasta sklopka 63 A, 500 V, 1-0 - 6 kom Automatski osigurač 10 A, 1p, "B" - 41 kom Automatski osigurač 16 A, 1p, "B" - Bakarne sabirnice, redne stezaljke, potporni izolatori, provodnici za šemiranje, šeme, opomenske tablice, natpisne pločice i sav sitan montažni materijal.				
		kom	1		
2.4.	Delivery and installation of metal distribution cabinet, type RT 6. The cabinet is made with mechanical protection IP 40, with lock and key. Cabinet's size is in accordance with the equipment placed inside it, so there is 30% of the reserve free space. Cabinet wiring shall be performed properly. Installed equipment shall be permanently and clearly marked. Cabinet shall be delivered with any necessary certificate of compliance for the equipment. Payment of completely delivered and installed cabinet as functional unit, with the following equipment: - 1 kom ZUDS -25/0,5A - 1 kom Tropolna grebenasta sklopka 25 A, 500 V, 1-0 - 2 kom Automatski osigurač 10 A, 1p, "B" - 8 kom Automatski osigurač 16 A, 1p, "B" - Bakarne sabirnice, redne stezaljke, potporni izolatori, provodnici za šemiranje, šeme, opomenske tablice, natpisne pločice i sav sitan montažni materijal.				
		kom	1		
2.5.	Delivery and installation of metal distribution cabinet, type RT 7. The cabinet is made with mechanical protection IP 40, with lock and key. Cabinet's size is in accordance with the equipment placed inside it, so there is 30% of the reserve free space. Cabinet wiring shall be performed properly. Installed equipment shall be permanently and clearly marked. Cabinet shall be delivered with any necessary certificate of compliance for the equipment. Payment of completely delivered and installed cabinet as functional unit, with the following equipment: - 1 kom ZUDS -25/0,5A - 1 kom Tropolna grebenasta sklopka 25 A, 500 V, 1-0 - 4 kom Automatski osigurač 10 A, 1p, "B" -20 kom Automatski osigurač 16 A, 1p, "B" - Bakarne sabirnice, redne stezaljke, potporni izolatori, provodnici za šemiranje, šeme, opomenske tablice, natpisne pločice i sav sitan montažni materijal.				
		kom	1		
2.7.	Delivery and installation of metal distribution cabinet, type RT 8. The cabinet is made with mechanical protection IP 65, with lock and key.				

Item	Description	UoM	Quant.	unit price	Total
	Cabinet's size is in accordance with the equipment placed inside it, so there is 30% of the reserve free space. Cabinet wiring shall be performed properly. Installed equipment shall be permanently and clearly marked. Cabinet shall be delivered with any necessary certificate of compliance for the equipment. Payment of completely delivered and installed cabinet as functional unit, with the following equipment: - 1 pcs Residual Current Device -40/0,5A - 1 pcs Three-phase cam switch 40 A, 500 V, 1-0 - 4 pcs Circuit breaker 10 A, 1p, "B" - 24 pcs Circuit breaker 16 A, 1p, "B" - Copper busbars, terminal blocks, line post insulators, wiring conductors, diagrams, warning signs, name plates and any fine material.				
		pcs	1		
2.8.	Delivery and installation of metal distribution cabinet, type RT 9. The cabinet is made with mechanical protection IP 65, with lock and key. Cabinet's size is in accordance with the equipment placed inside it, so there is 30% of the reserve free space. Cabinet wiring shall be performed properly. Installed equipment shall be permanently and clearly marked. Cabinet shall be delivered with any necessary certificate of compliance for the equipment. Payment of completely delivered and installed cabinet as functional unit, with the following equipment: - 1 pcs Residual Current Device -25/0,5A - 1 pcs Three-phase cam switch 25 A, 500 V, 1-0 - 3 pcs Circuit breaker 10 A, 1p, "B" - 18 pcs Circuit breaker 16 A, 1p, "B" - Copper busbars, terminal blocks, line post insulators, wiring conductors, diagrams, warning signs, name plates and any fine material.				
		pcs	1		
2.6.	Delivery and installation of metal distribution cabinet, type RT 10. The cabinet is made with mechanical protection IP 65, with lock and key. Cabinet's size is in accordance with the equipment placed inside it, so there is 30% of the reserve free space. Cabinet wiring shall be performed properly. Installed equipment shall be permanently and clearly marked. Cabinet shall be delivered with any necessary certificate of compliance for the equipment. Payment of completely delivered and installed cabinet as functional unit, with the following equipment: - 1 kom ZUDS -32/0,5A - 1 kom Tropolna grebenasta sklopka 32 A, 500 V, 1-0 - 3 kom Automatski osigurač 10 A, 1p, "B" - 27 kom Automatski osigurač 16 A, 1p, "B" - Bakarne sabirnice, redne stezaljke, potporni izolatori, provodnici za šemiranje, šeme, opomenske tablice, natpisne pločice i sav sitan montažni materijal.				
		kom	1		
2.7.	Delivery and installation of metal distribution cabinet, type RT 11. The cabinet is made with mechanical protection IP 65, with lock and key. Cabinet's size is in accordance with the equipment placed inside it, so there is 30% of the reserve free space. Cabinet wiring shall be performed properly. Installed equipment shall be permanently and clearly marked. Cabinet shall be delivered with any necessary certificate of compliance for the equipment. Payment of completely delivered and installed cabinet as functional unit, with the following equipment: - 1 kom ZUDS -32/0,5A - 1 kom Tropolna grebenasta sklopka 32 A, 500 V, 1-0 - 4 kom Automatski osigurač 10 A, 1p, "B" - 22 kom Automatski osigurač 16 A, 1p, "B" - Bakarne sabirnice, redne stezaljke, potporni izolatori, provodnici za šemiranje, šeme, opomenske tablice, natpisne pločice i sav sitan montažni materijal.				
		kom	1		
2.9.	Delivery and installation of PVC switchboard with 1x12 fuse places RT SS. Switchboard is made in mechanical protection IP 44, with transparent lid. Payment of completely delivered and installed cabinet as functional unit, with the following equipment: - 1 pcs Residual Current Device -40/0,5A - 8 pcs Circuit breaker 16 A, 1p, "B" - Copper busbars, terminal blocks, line post insulators, wiring conductors, diagrams, warning signs, name plates and any fine material.				

Item	Description	UoM	Quant.	unit price	Total
		pcs	1		
2.10.	Delivery and installation of the main equipotential bonding bar under or next to GRO, dim. 50x5x300mm. Calculation per piece.				
		pcs	4		

GENERAL NOTE: DISTRIBUTION CABINET SIZESHALL BE DETERMINED SUBSEQUENTLY, ACCORDING TO NUMBER, DIMENSIONS AND POSITION OF ADEQUATE EQUIPMENT, TAKING INTO ACCOUNT THAT 30% OF FREE SPACE SHOULD REMAIN.

TOTAL 2

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3. INSTALLATION MATERIAL

3.1.	Delivery and placement of installation material in PVC boxes in the brick wall or plaster wall and their connection. All switches shall be placed at the height of 1.1 m from the floor, and sockets to 0.35 m from the floor or according to the details in drawings. For technological sockets, mounting height shall be in line to the technological design details and manufacturer's requirements for equipment to be installed.				
	- Switches:				
	standard single-gang, 10 A, 250 V	pcs	50		
	two-gang switch, 10 A, 250 V	pcs	44		
	standard single-gang, 10 A, 250 V OG	pcs	4		
	alternating, 10 A, 250 V	ком	2		
	two-gang switch, 10 A, 250 V OG	pcs	2		
	toggle switch, 16 A, 250 V	pcs	8		
	Dimmer	pcs	1		
	-Outlets:				
	Single-phase "Schuko" plug socket 16A, 250 V	pcs	19		
	Single-phase "Schuko" plug socket with lid 16A, 250 V	pcs	86		
	Three-phase "Schuko" plug socket 16A, 400 V	pcs	4		
	Single-phase "Schuko" plug socket OG 16A, 250 V	pcs	4		
	Modular (2 power plug sockets) 16A, 250 V	pcs	74		
	Three-phase "Schuko" plug socket 16A, 400 V OG	pcs	2		
	Modular (3 power plug sockets) 16A, 250 V	pcs	64		
3.2.	Supply, delivery and installation (mounting on the underside of the tabletop) extension cable length of 1 m with 3 slots. Calculation per psc	pcs	6		
3.3.	Supply, delivery and installation (mounting on the underside of the tabletop) extension cable length of 2 m with 3 slots. Calculation per psc	pcs	6		
3.4.	Supply, delivery and installation (mounting on the underside of the tabletop) extension cable length of 3 m with 3 slots. Calculation per psc	pcs	6		
3.5.	Supply, delivery and installation of pvctrench parapet with cover, with two sections and the dispensing compartment for wire distribution, the maximum dimensions 65x150 mm with all necessary accessories for installation and fixing cables equivalent to type LEGRAND DLP Calculation per m'.	m1	8		
3.6.	Supply, delivery and installation of single-phase three-way connector assembly in the trench parapet with all necessary mounting Pibor equivalent to type Legrand MOSAIC 77402. Calculation per psc	pcs	6		

TOTAL 3

Item	Description	UoM	Quant.	unit price	Total

4. LUMINAIRES

This part of BoQ shall include: supply, installation and connection of below luminaires, including:
-delivery and installation of hooks for hanging or appropriate screw anchors for fixing the luminaire to the ceiling or wall
-delivery, installation and connection by clips on already mounted luminaire installation as described in certain items
-Installation of luminaires, light bulbs or fluorescent bulbs and starters

-washing, wiping and fixing a glass or plastic ball, bell or lid on luminaire, which are an integral part of the luminaire
-testing and start-up
-replacement of all light bulbs, fluorescent bulbs and starters that are faulty at the time of technical acceptance of installations
-fluorescent lamps shall be compensated at the power factor cos $\phi > 0{,}95$

Delivery and installation of luminaire as indicated on the drawings on the ceiling or wall, including mounting accessories, socket, electrical ballast and bulbs of adequate power.
Payment as delivered and prepared for proper operation. Luminaires as chosen by interior designer, who must approve in writing the installation of luminaries and the following characteristics

4.1.					
	Delivery and installation of built-in fluorescent luminaire 4x18w equivalent to type LP418 Elmat Beograd, or similar.	pcs	252		
4.2.					
	Delivery and installation of set of fluorescent luminaires with shiny gridlight, ceiling-mounted, protection IP40. The price includes delivery and installation of a complete luminaire, double-ended with four fluorescent bulbs of 36W, with starters and necessary accessories for installation.	pcs	116		
4.3.					
	Surface mounted luminaire equivalent to type **Titan 236W PC,** IP65. The luminaire is made of polycarbonate, electronic ballast and reflector made of white powder-coated sheet and fluorescent light sources 36W/840, **4000K,** Buck or equivalent.	pcs	33		
4.4.					
	Delivery and installation of LED spotlights equivalent to type BL F70W, IP65 for installation on the building's facade. Brilim or equivalent.	pcs	8		
4.5.					
	Delivery and installation of spotlights equivalent to type RVP 3,IP65 for installation on the building's facade. Philiphs or equivalent.	pcs	10		
4.6.					
	Opal sphere luminaire with fittings ϕ 200, flat,100 W.	pcs	106		
4.7.					
	Anti-panic light equivalent to type **Helios 8W**, SE, IP42, 3h of autonomy, non-maintained. The luminaire is made of V2 self-extinguishing polycarbonate, halogen free, Buck-Awex or equivalent, the light source and arrow inscription	pcs	43		
4.8					
	Anti-panic light equivalent to type **Helios 8W,** SE, IP42, h of autonomy, non-maintained. The luminaire is made of V2 self-extinguishing polycarbonate, halogen free, Buck-Awex or equivalent, the light source and EXIT inscription.	pcs	38		
4.9	Delivery and installation of spotlights equivalent to type Disano, IP65, 250W. Buck or equivalent	pcs	3		

TOTAL 4

GENERAL NOTE: BEFORE LUMINAIRE IS ORDERED, THE CONTRACTOR SHALL ONCE AGAIN AGREE THE TYPES OF LUMINAIRES WITH THE DESIGNERS. ONCE THEY ARE AGREED, THE CONTRACTOR SHALL SUBMIT FREE OF CHARGE ONE SAMPLE OF EACH TYPE OF LUMINAIRE FOR APPROVAL.

Item	Description	UoM	Quant.	unit price	Total

5. ELECTRIC SHOCK PROTECTION

5.1.	Delivery and installation of equipotential box as indicated in the drawing, at 30 cm from the floor in toilet wall. The box is fitted with a plastic cover and is equipped with connection hands for the conductor up to 35 mm² and 6 outlets for connection cables up to 6 mm².				
	Payment for delivery and installation.	pcs	8		

5.2.	Conductor N2XH-J 4 mm² below plaster (in wall) and in floor shall provide from equipotential box the terminals for connection of metal parts in toilets that are not integral parts of electrical appliances, such as: - wash basin drainage pipe, -sewage pipe, -water supply pipe (if not plastic), -bathtub, The average length per terminal is 4 m. Connection to pipelines is performed using fixing clips, lead pads thickness of 3 mm below the entire clip, M6 screw with nut and serrated pad and cable lugs. Connection to pipelines is performed in wall, to be covered by plaster or wall ceramic tile. Connection to pipelines is performed in wall, to be covered by plaster or wall ceramic tile. Total number of terminals per one box is 5. Required material per one box: -conductor N2XH-J 1x4 mm² 20 m Payment for labour and material per one box.				
		pcs	8		

5.3.	Delivery and installation of conductor PP-Y 1x6 mm² from protective busbar in switchboards to equipotential box in toilets, under plaster (in the wall) and in brick wall under wall cladding. The average length of conductor N2XH-J 1x4 mm2 per one equipotential box is 10 m. Payment for all labor and material per one equipotential box, along with connection in boxes and protective busbars in the corresponding cabinet.				
		pcs	8		

TOTAL 5

Item	Description	UoM	Quant.	unit price	Total

6. SUNDRIES

6.1.	Disconnection and reconnection of existing substation MBTS 10/0.4 necessary for the works.	LS	1		
6.2.	After works are completed on electrical installations, the Contractor is obliged to perform the following:				
6.3.	- Submit to the Investor all necessary certificates of compliance for installed equipment - Review and perform functional testing of electrical installations in terms of isolation and safety against over-voltage touch. Perform ground resistance measurements and ground loop resistance and the results shall be handed over to the Investor - Remedy any technical and aesthetic errors - Making changes during the execution of electrical installations - Take over of electrical installations for use by the Investor				
		LS	1		
6.4.	Development of As-built design of high voltage installations	LS	1		
6.5.	Construction of channels 100x50 mm for laying cables in walls.Calculation per meter.	m	2500		
6.6.	Construction of channels 500x50 mm for laying feeding cables in wall for distribution cabinets on floors.Calculation per meter.	m	60		
6.7.	Construction and installation of ceiling access, dim. 40x40 cm in plaster ceiling in the hallway for accessing electrical installations. Calculation per piece.	pcs	10		
6.8.	Dismantling of lightning conductor strip and pads on the roof, and their reinstallation and connection after roofing is replaced. Lump sum calculation.	LS	1		
6.9.	Connection of downpipes by appropriate clips with existing strip from the foundation after they are replaced. Calculation per piece.	pcs	16		
6.10.	Measuring and testing of lightning grounding, and delivery of expert findings on lightning installation testing. Lump sum calculation.	LS	1		
6.11.	Dismantling of existing elements of electrical installations in the building (luminaires, sockets, distribution cabinets, etc.) NOTE: All demolished materials shall be deposited on a temporary landfill up to 100m of distance and successfully transported to the city landfill. The price of dismantling and demolition includes cleaning of the workplace, loading, transport and unloading at temporary landfill, and transfer, sorting and handing usable material at temporary storing area.	LS	1		

TOTAL 6

III SUMMARY of electrical installations

1. CABLES AND PIPES	
2. DISTRIBUTION CABINETS AND SWITCHBOARDS	
3. INSTALLATION MATERIAL	
4. LUMINARIES	
5. ELECTRICAL SCHOCK PROTECTION	
6. SUNDRIES	

TOTAL III

ESTIMATED BILL OF QUANTITIES OF TELECOMMUNICATION INSTALLATIONS

This Bill of Quantities includes installation, connection, testing, commissioning, trial operation and handover of any material and equipment listed below in mentioned items.
Prices include cost of material, labour, transport, all taxes and contribution to materials, and any insurance. In addition, the prices include delivery and installation of any fine unspecified material required for completion of equipment and works, as well as remedy of other works damaged during execution of the installations on this project.
Prices include development of all necessary shop documentation required for manufacture, installation, testing, commissioning and maintenance of equipment.
All material used must be of first class quality and conform to the standards. All work must be performed by skilled labour, and completely according to the applicable technical regulations in Serbia and for a given type of work.

ESTIMATED BILL OF QUANTITIES OF SIGNALLING AND TELECOMMUNICATION SYSTEMS

GENERAL

This BoQ includes:
delivery of all materials specified in individual items and all fine unspecified material, necessary for quality and complete execution of installations;
material incorporation as stated in the individual items in accordance with the applicable rules and regulations for quality workmanship;
testing and commissioning of completed installations;
remedy of all damaged parts of already performed works.
All material used must conform to applicable standards and international standards for computer telephone network IEC/ISO 11801.

For works on telecommunication-signaling installations and systems the Contractor must hire skilled labour and a Responsible Contracting Engineer for telecommunication networks and systems. All works must be carried out fully in accordance with the applicable regulations for the respective works.
Prior to work commencement, correct measures shall be taken on the spot.
Price includes all the necessary material and labor. Price includes making any shop documentation that may be needed.

1. INTEGRATED COMPUTER - TELEPHONE NETWORK

A STRUCTURED NETWORK CABINETS

1 Delivery of free-standing Rack, dim.800x800mm, height 42HU, with glass doors, cooling fans (4 pcs), thermostat, power supply rail 7x220 V, 50 Hz (2 pcs), with cable inlets on the top and bottom, grid 19", grounding set, classification rings for vertical cable management, rails for taking up cables with removable sides. Rittal or equivalent.
Including installation and connection. pcs 2.00

Supply, delivery and installation 9U Rack cabinet with glass doors, lock and key. Cabinet shall be equipped with a single Patch panel with 24 ports and the power rack, cooling fan unit with 2 fans. No active equipment.
Including installation and connection. pcs 1.00

Supply, delivery and installation 6U Rack cabinet with glass doors, lock and key. Cabinet shall be equipped with a single Patch panel with 8 ports and the power rack, cooling fan unit with a fan. No active equipment.
Including installation and connection. pcs 2.00

2 Delivery and installation of Patch Panel 19" with 24 connection modules, height 2 HU, Category 6, connecting installations on micro-plugs and printed labels marking. Reichle & De-Massari, R305120. Connecting module must have a certificate of quality: 3P, Delta, SGS or GHMT for cat6 under the latest version of the standard EN50173 (for the implementation of IEEE 802.3an 10GBase-T 10Gb/s at channel 100m) pcs 3.00

3	Delivery and installation of Cable Management Plastic, 19", 1 HU, Reichle & De-Massari, R306179 or equivalent.	pcs	3.00
4	Delivery, installation and connection of UPS Rack 2000 VA, 2000VA/1350W, Autonomy 10 minutes, for installation in rack frames. Line-Interactive, the input voltage 230VAC, acceptable variations of voltage (175-200VAC) and 50/60Hz (+/- 5%), the output voltage of 220 V sine wave (tolerance +/- 2%) transfer time up to 2 ms, microprocessor control, RS-232, port to the computer (cable supplied), software. Including installation and connection.	pcs	2.00
5	Delivery and installation of 19" rack for NonRack devices, depth 800 mm.	pcs	1.00
6	Supply, delivery and installation of 6U Rack with glass door and lock and key. Rack frame shall be equipped with a single Patch panel with minimum 8 ports and power rack, as well as with fan unit for cooling with a fan. No active equipment. Including installation and connection.	pcs	2.00
7	Supply, delivery and installation of Shucko panel with 3 Shucko sockets. Including installation and connection.	pcs	5.00
8	Supply, delivery and installation of mini-com TX-6 PLUS RJ45 Module CAT6. Including installation and connection.	pcs	74.00
9	Supply, delivery and installation of adapter 45/45 mm 2xRJ45. Including installation and connection.	pcs	28.00
10	Supply, delivery and installation of Desktop Switch, 8 ports, TP-LINK, TL-SG1008 or equivalent. Including installation and connection.	pcs	3.00
11	Supply, delivery and installation of Desktop Switch, 16 ports, TP-LINK, TL-SG1016D or equivalent. Including installation and connection.	pcs	1.00
12	Supply, delivery and installation of Desktop Switch, 24 ports, TP-LINK, TL-SG1026D or equivalent. Including installation and connection.	pcs	1.00
13	Delivery and installation of Cable Management Plastic 19", 1 HU, Reichle & De-Massari, R306179 or equivalent.	pcs	6.00
	Total - Racks		

C	**CABLES**		
14	Delivery and installation of cable S/FTP 4 x 2 x 0.55, Cat6, LSZH, in PVC pipes. Reichle & De-Massari, p/n R305649 or equivalent. Calculation per meter of cable.	m	2,100.00
15	Delivery and installation of PVC, halogen free conduits. Conduits shall be laid in the wall below mortar. Calculation per meter of conduit. ø 16 mm	m	1,000.00
16	Delivery, installation and connection of power cable N2HX-Y 3x2.5mm2.	m	30.00
17	Delivery, installation and connection of grounding cable N2XH-Y 1x16 mm2.	m	30.00
18	Delivery of Patch cord FTP cat.6, factory built and tested for connecting in Rack length 0.5 m, Reichle & De-Massari, R302332 or equivalent.	pcs	47.00
19	Delivery of Patch cord FTP cat.6, factory built and tested for connecting in Rack length 1 m, Reichle & De-Massari, R302332 or equivalent.	pcs	37.00
20	Delivery of Patch cord FTP cat.6, factory built and tested for connecting in Rack length 2 m, Reichle & De-Massari, R302333 or equivalent.	pcs	36.00
21	Delivery of Patch cord FTP cat.6, factory built and tested for connecting in Rack length 3 m, Reichle & De-Massari, R302334 or equivalent.	pcs	36.00
	Total - Cables		
D	**INSTALLATION MATERIALS**		
22	Delivery and installation of Connection module for installation in wall for one terminal point consisting of: shielded plug connection RJ-45, Category 6, PVC box and housing with mask, with connecting of installations and marking with printed labels, Reichle & De-Massari, R302372 R304327 + or equivalent		

	Connection module has to have one of the following certificate of quality: 3P, Delta, SGS or GHMT for cat6 under the latest version of standard EN50173 (for implementation of IEEE 802.3an 10GBase-T 10Gb/s on channel 100m) Including delivery, installation and connection.	pcs	63.00
23	Delivery and installation of TT socket, wall-mounting, for one convenience outlet comprising: shielded micro socket RJ-11, PVC conduit box and casing with a mask, including connection of installation and marking with printed labels, Reichle & De-Massari or equivalent. Including delivery, installation and connection.	kom	5.00
24	Delivery and installation in the building, of telephone concentration cabinet ITO L1, capacity 10x2, wall-mounted. Cabinet shall be equipped with the following equipment: '- Connection Module 10 pairs, 10x2, 1 piece. Equivalent to Reichle & De-Massari R27001-20-1 '- Disconnection Module 10 pairs, 10x2, 1 piece. Equivalent to Reichle & De-Massari R27002-20-1 - carrier for 2 modules, 1 piece Equivalent to Reichle & De-Massari R27002-1 Supply and installation.	set	1.00
25	Supply and installation of fine installation material.	LS	1.00
	Total - Installation material		
E	**INSTALLATION TESTING**		
26	Testing all performed computer telephone lines, attesting to Cat 6 and issuing protocols with measurement results printed in 2 copies.	pcs	68.00
27	Development of As-built design of computer-telephone network and delivery of 6 hard copies and electronic form.	LS	1
	Total - installation testing		
	Total - Computer-telephone network (A+B+C+D+E)		

2. VIDEO SURVEILLANCE SYSTEM

1. ONVIF compatible dome colour IP camera day/night; 4CIF resolution (704x576 @ 25 fr/sec); 1/3 " Sony Super HAD sensor; sensitivity 0.1Lux @ F1.2, 0.0003Lux@ (F1.2, sense up×256); built-in varifocal lens with manual aperture (2.8~11 mm); Software-based day/night functionality; H.264 dual stream compression with flow control through the network (32K ~ 8M); 1 audio input (Ogg Vorbis compression) / audio output; 2 alarm inputs/outputs; SD card slot for local recording; analog output with a resolution of 540 TVL; Protocols TCP/IP, HTTP, DHCP, DNS, RTP/RTCP, PPPoE; Supply 12Vdc/PoE similar to type DS-2CD793PF-E, HikVision

pcs. 24

2. ONVIF compatible dome anti-vandal camera for external mounting; 2 Megapixel Resolution, 1/3" Progessive Scan CMOS, 1600x1200@12.5fps, HD@25fps; Vandal-proof housing, IP 66; Built-in motorized varifocal zoom lens (controllable via software) 2.7-9mm; Sensitivity 0.5 Lux/0Lux IR ON; mechanical IR filter, H.264/MJPEG dual stream compression with flow control through the network (32K ~ 8M); 1 audio input/output, 2 alarm inputs/2 outputs; slot for Micro SD card slot for local recording (32GB); e-PTZ functions for digital image magnification, vandal-proof, 12Vdc/24Vac/PoE 14W similar type of DS-2CD7253F-EIZ HikVision

pcs. 11

3. Camera for video surveillance of sports courts day/night with IR illumination, 600 TV Lines (colour)/700 TV Lines (B/W), 1/3" SuperHAD II CCD, varifocal auto-iris lens 2.8 ~ 10 mm, built-in IR lighting range up to 50m, Day/Night function by mechanical IR filter, 0.15 lux/0.00 lux (IR on), digital noise filter (SSNRIII), optimization of images shot in the dark zone (SSDR), improved sensitivity (Sens-up x2-x512) digital image stabilization (DIS), OSD, BLC, for outdoor mounting (IP66), 12Vdc/24Vac/6.8W similar to type SCO-2080RP Samsung

pcs. 4

4.	NVR, PLUG AND PLAY; Recording by up to 8 IP cameras; BUILT-IN 8-channel PoE switch for camera power supply; H.264 compression; Dual-Stream; Record up to a resolution of 5 Mpix; Inbound/Outbound traffic = 20/40 Mbps; Recording Speed of 8 IP cameras in 4CIF resolution in real-time or 2MP, 5MP (non realtime); up to 2 SATA HDD (up to 2TB each), HDMI monitor output; 4 alarm inputs/2 outputs; 12Vdc, 1U, 19" similar to type DS-7608NI-SP Hik Vision	pcs.	6
5.	8-channel digital video recorder/server with image display in 4CIF resolution in real time; Loop outputs, H.264 compression, recording in real time for each camera 25FPS @ 4CIF/2CIF/CIF, USB2.0 port for backup to USB memory/HDD/DVD-RW, support for up to 4xSATA or 2xSATA HDD + 1 x CD/DVD/RW, 4 audio inputs/1 audio output, 8 alarm inputs/4 alarm inputs, 2 composite outputs (BNCx2, main/spot), VGA output (main) and HDMI output; RS-485 control of PTZ cameras, two independent video streams - DUAL STREAM; regulation of the flow through the network for each channel, surveillance over the mobile phone, CMS software, mouse control or by remote control, without HDD similar to type DS-7308HFI-ST, Hik Vision	pcs.	1
6.	Western Digital, 500Gb Cavier Blue, 7200RPM, SATA III, 16Mb (AV TECH; HikVision)	pcs.	7
7	22" FullHD TFT-LCD professional monitor, Full HD resolution 1920 x 1080, Brightness 300 cd/m2, contrast 1000:1, 5ms, 16:9 format, 3D comb filter, Inputs - BNCx2/VGA/HDMI, built-in speaker 2x1W, remote control included, 230Vac/46W similar to type SMT-2231 Samsung	pcs.	3
8	Supply and laying of coaxial cable 75 ohm, copper shield (95%) and tendon, type RG 59HF	m	600.00
9.	Delivery and installation of installation cable S/FTP 4 x 2 x 0.55 Cat6, LSOH, in PVC conduits. Reichle & De-Massari, p/n R305649 or equivalent. Calculation per meter of conduit	m	2350

10.	Delivery and installation of PVC halogen free conduits. Conduits shall be laid in the wall below mortar. Calculation per meter of conduit. ø 16 mm	m	1300
11	Delivery and installation of PVC junction boxes 250x250x100 mm for connecting the installation. Calculation per piece	pcs.	5
12	Supply, delivery and installation of a transient BNC male/RCA female connector (Cinch)	pcs.	80
13	Supply, delivery and connection of computers equipped according to end-users' requirements for video surveillance. Deliver to the following customers: Director and Duty worker. Calculation per piece.	pcs.	2
14	Punching brick walls and concrete slabs for cable passing, including wall remedy by fireproof compound around protrusions after cables are laid. Submit a certificate of compliance issued by an authorized person for installation of fireproof compound and its certificate. Calculation per piece of protrusion	pcs.	13
15	Training of users on the use of video surveillance installations.	LS	1
16	Development of technical documentation, as-built design of video surveillance systems. The design shall be submitted in triplicate hard copy and electronic version on CD. Lump sum calculation	LS	1
17	Delivery and installation of fine installation material and supplies for video surveillance system (plugs, screws, duct tape, PVC cable ties, etc.). Lump sum calculation.	LS	1.00
	Total - Video surveillance system		

3. SIGNALIZATION AND CLOCK INSTALLATION

1.	Delivery and installation of master clock in Racks for timing and control of clocks in the hallways of the school, programmed for time intervals for class – breaks according to the school schedule. Calculation per piece.	pcs	1.00
2.	Delivery and installation of electric clock, a digital single-sided, with accessories and bracket. Calculation per piece.	pcs	3.00
3.	Delivery and installation of electric clock, a digital two-sided, with accessories and bracket. Calculation per piece.	pcs.	8.00
4.	Delivery and installation of electrical bell 24VDC for announcing time intervals according to the school schedule. Mounted on the ceiling or wall according to provided drawings. Calculation per piece	pcs.	9.00
5.	Delivery and installation of a waterproof electrical bell 24VDC for announcing time intervals according to the school schedule. Mounted on the wall according to the provided drawings. Calculation per piece.	pcs.	2.00
6.	Delivery and installation of PVC halogen free conduits. Conduits shall be laid in the wall below mortar. Calculation per meter of conduits. ø 16 mm	m	550.00
7	Delivery, installation and connection of cable for signalization JH(St)H 2x2x0,8mm2.	m	850.00
8	Delivery and installation of fine supplies,plugs, screws etc. Lump sum calculation	LS	1.00
9	Testing of the entire system, setup and commissioning. Development of protocols for all measurements and issuing certificates, development of As-built design	LS	1.00
	Total - Signalization and clock installation		

5. SOUND SYSTEM

1	Ceiling speaker, 5W/8W for indoor installation, input voltage 70/100V, frequency 110-13000Hz, sensitivity 98 dB, similar to type T-105A ITC.	pcs.	58

2	Ceiling speaker, 20W for indoor installation, input voltage 70/100V, frequency 110-13000Hz, sensitivity 98 dB, similar to type T-205CW ITC	pcs.	4
3	Projection speaker, 25W for indoor installation in the gymnasium, input voltage 100V, frequency 250-8000Hz, sensitivity 93 dB, similar to type T-740B ITC	pcs.	4
4	Surface-mounted waterproof speaker for outdoor installation in the courtyard, 30W, input voltage 100V, frequency range 70-20000Hz, sensitivity of 88 dB, similar to type WPS-6W.	pcs.	5
5	Delivery of amplifier, power 120W, 2xAUX ,1x LINEOUT, 3 x MIC, TEL input, protection against overheating, overload and short circuit, mute potentiometer, output 70V/100V, 4 and 16 ohm, 220VAC power supply, similar to type T 120AP ITC	pcs.	2
6	Delivery and installation of 3U integrated amplifier in Rack, with preamplifier 7 input channels, independent adjustment of the volume of each channel, shared volume control, first microphone of the highest priority, independent tone control (gain, bass, treble), protection against short circuit, overload and overheating, 500W, 2 mic inputs, 3 AUX inputs, 1 AUX output, 5 LED indicators, outputs at 70V/ 100V, 4 and 16 ohm, 220VAC power supply, similar to type of T-500 ITC	pcs.	2
7	Delivery and installation into Racks the following equipment similar to type		
	System controller T6200	pcs.	1
	Digital Tuner T 6222	pcs.	1
	CD Player T 6221	pcs.	1
	Audio matrix distributor T 6233	pcs.	1
	All installed, tested and commissioned.	set	1
8	Wired microphone with a stand similar to type T 621 ITC	pcs.	3
9	Delivery and installation of PVC halogen free conduits. Conduits shall be laid in the wall below mortar or along the structure above suspended ceiling. Calculation per meter of conduit.		
	ø 16 mm	m	1700
10	Delivery, installation and connection of cable for signalization LiHCH 3x1,5 mm2.		
		m	2600

11	Delivery and installation of fine supplies, plugs, screws etc. Lump sum calculation	LS	1
12	Testing of the entire system, setup and commissioning. Development of protocols for all measurements and issuing certificates, development of As-built design	LS	1
	Total - Sound system installations:		

6. INTRUSION DETECTION SYSTEM

1	Delivery and installation of intrusion alarm panels: - extensions and keyboards placed in the rooms of duty workers and shall be under supervision 24 hours		
	Central unit Vista 120	pcs.	1
	Housing for central unit with a network, rectifier and charging unit	pcs.	1
	Keyboard (encoder) 6164	pcs.	1
	Addressable extension 8 zones 4208U	pcs.	13
	wireless receiver 5881H	pcs.	5
	Pendant Panic Button 5802 EU	pcs.	6
	Spare rechargeable batteries placed in the central unit housing	pcs.	1
	Software for central unit	pcs.	1
	Network interface card - system control from monitoring center	pcs.	1
	Metal housing for max.3 addressable extensions with supporting elements	pcs.	5
	Instructions for use of the Serbian language	pcs.	1
	Visible block diagram of the Intrusion Detection System (next to central unit)		
	Including delivery, transport, installation, programming and commissioning.	**pcs.**	**1**
2	Delivery and installation of infrared ceiling sensor Sx-360 optex	pcs.	**71**
3	Delivery and installation of FRP dual-tone siren 120dB, with flashing-intrusion detection	pcs.	**4**
4	Delivery and installation of PVC halogen free conduits. Conduits shall be laid in the wall below mortar or along the structure above suspended ceiling. Calculation per meter of conduit		
	ø 16 mm	m	1400
5	Delivery, laying and connection of cable JH(ST)HY3x2x0.6mm for connecting detectors and barriers		
		m	2000

6	Delivery, laying and connection of cable JH(ST)HY5x2x0.8mm for connecting addressable extensions and encoder	m	950
7	Delivery and installation of fine supplies, plugs, screws etc. Lump sum calculation	LS	1
8	Testing of the entire system, setup and commissioning, including training of consumers. Development of As-built design.	LS	1
	Total - Sound system installations:		

SIGNALLING AND TELECOMMUNICATION SYSTEMS

1. Integrated computer-telephone network

Total

2. Video surveillance system

Total

4. Signalization and clock installation

Total

5. Sound system installations

Total

6. Intrusion detection system

Total

T O T A L 0 - 5

6. ESTIMATED BILL OF QUANTITIES

Design of Automatic fire alarm

GENERAL NOTES

This specification provides for the delivery of any equipment and material specified in the items and all fine unspecified materials needed to full fabrication, installation, testing and commissioning, as well as remedy of damaged portions of already executed works.
The price includes cost of any listed equipment and materials given in the item specification as well as any fine unspecified materials, transport and labor, all taxes and contributions in materials and labor.
The price includes the cost of system software with services for development of application programs, validation documentation, training of end users and handover. Price includes development of all necessary shop documentation, testing and commissioning of all plants and installations as specified in items, as well as the issuance of certificates of compliance and certificates according to the following unit price breakdown:
a. Unit price of "delivery" includes the cost of equipment and/or material ex-works manufacturer's plant or place of purchase, subject to applicable/specified standards and shall additionally contain:
- Transport and insurance to the site and on-site;
- Special equipment and tools for operation and maintenance, if any, with instructions for use;
- Packaging and protection/preservation of plant, equipment and/or materials on site;
- Supporting documentation of equipment and/or materials (certificates, drawings, lists of spare parts and wearing parts, list of maintenance tools, necessary descriptions, shop documentation, instructions for installation, operation and maintenance, et.).

b. Unit price of "installation" includes everything that is not included in the price of "delivery", i.e. all the work of machinery and labor, including all preparatory and finishing works, commissioning and proving the required parameters, users' training, making of changes in design documentation, etc.

No.	Description	UoM			Ukupna cena [din]
	FIRE DETECTION				
1	Addressable fire alarm central unit with 2 loops which can support 250 addressable elements, with display in prefabricated enclosure for module, serial RS-485 port, serial RS-232 port, one attended input, 1 unattended input, 1 alarm input 2 volt-free relay outputs, 2 voltage outputs, with rechargeable batteries 2x12V/38Ah, meets EN54 - Tyco Zettler MZX252 or similar	pcs	1.00		
2	Two-channel telephone alarm carrier for sending two independent alarm messages at 6-programmed phone numbers - Fidra P-VOX or similar	pcs	1.00		
3	Parallel panel with 16 zones, with display in prefabricated enclosure, serial RS-485 port, a separate BUS for connecting with a central fire alarm unit of maximum length 1200m, with rechargeable batteries 2x12V/7Ah, meets EN54 - Tyco Zettler MZX16R or similar	pcs	1.00		
4	Addressable optical smoke detector, operating voltage: 20-40VDC, operating temperature: -25 ° to + 70°C, meets EN54 - Tyco Zettler 830P or similar	pcs	80.00		

5	Addressable optical and heat (heat maximum and heat differential) detector, operating voltage: 20-40VDC, operating temperature: -10 ° to + 55°C, meets EN54 - Tyco Zettler 830PH or similar	pcs	12.00		
6	Addressable highly sensitive optical and heat (heat maximum and heat differential) CO detector, operating voltage: 20-40VDC, operating temperature: -25 ° to + 70°C, meets EN54 - Tyco Zettler 830PC or similar	pcs	8.00		
7	Base for addressable detectors, IP21 protection- Tyco Zettler 4B or similar	pcs	87.00		
8	Additional enclosure for detector base for increasing IP protection to IP55 - Tyco Zettler 4B-DHM or similar	pcs	6.00		
9	Additional enclosure for detector base for OG installation - Tyco Zettler 4B- EM or similar	pcs	6.00		
10	Addressable manual Call Point for indoor installation with test key, with flexible button (no need for replacement during activation), IP24D protection, integrated loop isolator, meets EN54 - Tyco Zettler CP820 or similar	pcs	10.00		
11	Enclosure for addressable manual call point for indoor installation - Tyco Zettler SUS516 or similar	pcs	10.00		
12	Addressable manual Call Point for outdoor installation with test key, IP54 protection, integrated loop isolator, meets EN54 - Tyco Zettler DIN830 / IUR or similar	pcs	1.00		
13	Addressable alarm siren with flash (supplied with a stand for assembly) for outdoor installation with integrated loop isolator, power supply from loop, two volume levels: 90 dB and 103 dB, IP65 protection, meets EN54 - Tyco Zettler LPAV865 or similar	pcs	3.00		
14	Addressable detector base with built-in alarm siren for indoor installation, IP21C protection, four volume levels from 60 dB to 90 dB, integrated loop isolator, meets EN54 - Tyco Zettler LPSB3000 or similar	pcs	13.00		
15	Addressable module with a controlled input and one floating relay output, power supply from loop, operating temperature: -25 ° to + 70°C, IP55 protection, integrated loop isolator, meets EN54 - Tyco Zettler SIO800 or similar	pcs	1.00		
16	Addressable module with four monitored inputs and four potential-free relay outputs, power supply from loop, operating temperature: -25 ° to + 70°C, IP66 protection, built-in loop isolator, meets EN54 - Tyco Zettler QIO850 or similar	pcs	2.00		
17	Magnetic contact for smoke doors - Tyco Zettler Surface Mount Magnetic Contact or similar	pcs	4.00		
18	Electromagnetic release for smoke doors with a set for door closing, ABS enclosure, 24VDC - Tyco Zettler Door Release Magnet Set or similar	pcs	4.00		
19	Power supply unit for electromagnetic release for smoke doors, 24VDC 2.6A, in enclosure, with rechargeable batteries 2x12V/7Ah, meets EN54 - Tyco Zettler Door Release Magnet Set or similar	pcs	2.00		
20	Detector identification label - Tyco Zettler DAF or similar	pcs	100.00		
21	Fine installation material for fire alarm	LS	2.00		
22	Installation fire resistant cable JE-H (St) H 2x2x0.8mm FE180 / E30	m	1,400.00		
23	Installation fire resistant cable N2XH-J 2x1,5mm2 FE180/E30	m	20.00		
24	Installation fireproof clips E30 for cable JE-H(St)H 2x2x0,8mm FE180/E30	pcs	1,800.00		
25	Installation halogen free flexible PVC pipe Φ = 16mm for indoor use	m	850.00		
26	Delivery and fabrication of fireproof partitions and coatings on electrical cables crossings between fire sectors	LS	1.00		
27	Installation, programming, commissioning and users' training for the fire detection system	LS	1.00		

ESTIMATED BILL OF QUANTITIES OF MECHANICAL INSTALLATIONS

PROJECT: Reconstruction of High school in Obrenovac
INVESTOR: Republic of Serbia. High school in Obrenovac

HEATING SUBSTATION

A	**DISMANTLING**	UoM	QUANTITY	unit price	TOTAL
1	Dismantling of equipment and pipelines in the existing substation. The price includes transport outside the facility up to 50m of distance, as specified by the Investor.	pcs	1.00		
2	• Dismantling of equipment and pipelines in the room designated for a new substation. The price includes transport of equipment outside the building up to 50 m of distance, as specified by the Investor.	pcs	1.00		
3	• Dismantling of substation and pipeline in basement. The price includes transport of equipment and pipes outside the building up to 50 m of distance, as specified by the Investor.	LS	1.00		
	TOTAL A. DISMANTLING				
B	**INSTALLATION**				
1	•Supply, delivery and installation of a plate (or soldered) heat-exchanger Qnom.= 650kwW increased for impurity Q=900kW TRACO or appropriate, with following characteristics: • primary: 115/75ºC • secondary 70/90ºC • nominal pressure primary/secondary 16/6 bar • pressure drop primary secondary 4/25 bar • connections primary, secondary DN65/DN65	pcs	1.00		
2	• Supply, delivery and installation of closed diaphragm expansion vessel V=500l, NP6bar, Elbi or equivalent, supplied complete with diaphragm.	pcs	2.00		

3	• Supply, delivery and installation of safety valves with spring, calibrated and certified by the competent body				
	DN50PN6 Potv 4 bar(absol.press.)	pcs	2.00		
	DN25 PN6 Potv 4 bar(absol.press.)	pcs	1.00		
4	•Supply, delivery and installation of circulation sets with coupling sealant material, Wilo or appropriate, with the following characteristics: •type: Stratos 65/1-12 •flow 30,75 m³/h •discharge: 0,768 bar. •power : 1400W(230V, 50/60Hz)	pcs	2.00		
5	• Supply, delivery and installation of silencer type "GUKO" or equivalent for use with hot water, complete with counter flanges, bolts, nuts and gaskets DN65	pcs	2.00		
6	•Supply, delivery and installation of hard supporting pillars of the circulating pumps positioned in front of and behind the pumps, pipelines of primary and secondary, made of steel sections and flat iron	kg	95.00		
7	•Supply, delivery and installation of ball valve with flanges, counter flanges, gaskets, bolts, nominal pressure NP16 DN65 PN16	pcs	5		
8	• Supply, delivery and installation of air vessels, complete with overflow line and tap DN15 and DN20 ¢200 mm x 4 mm x 300 mm	pcs	3.00		
9	• Supply, delivery and installation of steel pipes, according to SRPS C.B5.221				
	¢21,3 x 2,3	m	12.00		
	¢26,9 x 2,3	m	6.00		
	¢33,7 x 2,6	m	12.00		
	¢60,3 x 2,6	m	12.00		
	¢76,1 x 2,9	m	18.00		
	¢88,9 x 3,2	m	15.00		
10	•Fittings, sliding and fixed supports, hangers, core, joints and sealants account for 50% of Item 9	50.00%	0.50		

11	• Supply, delivery and installation of ball valve with flanges, counter flanges, gaskets, bolts, nuts, nominal pressure PN6				
	DN80PN6	pcs	6.00		
	DN65PN16	pcs	2.00		
12	• Supply, delivery and installation of threaded ball valve with handle				
	DN25PN6	pcs	3.00		
	DN20PN6	pcs	9.00		
13	• Supply, delivery and installation of gate valves with oblique spindle for controlling the flow with connections to differential pressure gauge and relief valve				
	DN80PN6	pcs	1.00		
	DN50PN16	pcs	2.00		
14	• Supply, delivery and installation of strainers with flanges, counter flanges, gaskets, bolts				
	DN80PN6	pcs	1.00		
	DN65PN6	pcs	1.00		
15	• Supply, delivery and installation of non-return valve with flanges and counter flanges, gaskets and				
	DN80PN6	pcs	2.00		
	DN25PN6	pcs	2.00		
16	• Supply, delivery and installation of delivery cock with cap and chain DN20PN6	pcs	4.00		
17	• Supply, delivery and installation of the meter for heat consumption on the addition DN25PN16 Qp = 1,5 m³/h 220 V power supply, complete with the computing unit and seal of the Directorate of Measures and Precious Metals	pcs	1.00		

18	• Supply, delivery and installation of ultrasonic heat meter - calorimeter, Kanstrup or equivalent DN65 PN16. QP = 6-25m³/h, 220V power supply, complete with the computing unit and the temperature probes, connection to the installation: flanges, trademark Directorate of Measures and Precious Metals	pcs	1.00		
19	• Supply, delivery and installation of thermometer in a brass housing, ranges from 0 to 200°C	pcs	4.00		
20	• Supply, delivery and installation of pressure gauges with gauge cock				
	range 0- 25 bar	pcs	2.00		
	range 0- 10 bar	pcs	2.00		
21	• Cleaning and painting of black steel pipes and supports before installing insulation, primer consistent at temperature of 120°C	m2	15.00		
22	• Supply, delivery and installation of distributors and collectors with connections with the necessary technical documentation, steel stand made of "U" sections and insulated with mineral wool thickness d=50mm in aluminum sheet cladding d=0.7mm, size DN250 x 1500 mm	set	2.00		
23	• Supply, delivery and installation of insulation for pipes and substation equipment, with preliminary cleaning and minimization of mineral wool d=50mm in aluminum sheet cladding, thickness 0.5mm. Provide for insulation that can be dismantled and installed in lengths 15 x pipe d	m2	35.00		
24	• Supply and delivery of fire extinguishers with dry powder, type S-9 and carbon dioxide CO2 5k	set	1.00		
	TOTAL B. INSTALLATION				
C.	**PREPARATION FOR FINISHING WORKS**				

1	•Preparation works include •Site establishment •comparison of actual state with design documentation, in case of discrepancies consult the Supervision • required measuring and aligning	LS	1.00		
2	• Drilling holes in walls for the passage of the horizontal distribution network, and other related construction works related to the installation of equipment and pipelines	LS	1.00		
3	• After installation is completed, pipelines shall be tested on strength and tightness by cold water compressive strength, pressure in primary section 21 bar, in secondary section 6 bar, and tightness by pressure of 4 bar. Test pressure on gauges must be constant for 8 hours and monitored for leakage and wetting both on their joints and base material. After performed tests, records shall be prepared	LS	1.00		
4	• After cold test is performed, all pipelines shall be flushed with cold water, screens shall be removes from dirt traps and lines opened for removing sludge from equipment. Flushing shall be performed until completely clean water appears from heat substation	LS	1.00		
5	• Hot test. Test plant of performed hot water installation with water amount control through the pump and pipelines. Hot test is carried out for a period of five (5) working days, and the Contractor shall bear the cost for heat	LS	1.00		
6	•Preparation of block diagrams and instructions for operation and maintenance of heating substations. Instructions must be framed, glazed and placed at visible place in the heating substation. Preparation of as-built documentation in three copies	LS	1.00		

7	• Any internal transport of tools and supplies, measuring and control instruments, any transport of equipment and materials to the construction site, including storage, fitters' access to the site, collection of the remaining material and site	LS	1.00		
8	Test inspection, remedy of objections, development of Final design of the constructed facility and quality handover to the Investor	LS	1.00		
	TOTAL C. PREPARATION FOR FINISHING WORKS				
	TOTAL A.+B.+C.(HEAT SUBSTATION)				
	ADDITION 1				
	Specification of works and estimated Bill of Quantities for radiator heating on the ground floor in High school in Obrenovac				
1	•Water discharge from radiator heating installations	set	2.00		
2	•Dismantling of the existing installations of radiator heating: heaters of radiator valves and lockshield valves, cleaning, flushing, sand blasting and re-painting of heaters and their disposal within the site until their re-assembly. Terminals of the pipe network shall be protected to avoid damage and dirt				
	radiators	pcs.	121.00		
	radiator valves and lockshield valves	pcs.	121.00		
3	•Supply of new radiator valves and lockshield valves	kom	121.00		
4	• Blinding of radiator connectors of dismantled heaters	LS	2.00		
5	•Cleaning and degreasing of pipe network made of steel pipes (minimization) by protective paint consistent at operating temperature. Before pain is applied, protection pipes shall be thoroughly cleaned from rust and dirt.				
	¢ 3/8"	m	220.00		
	¢ 1/2"	m	570.00		

	¢ 3/4"	m	450.00		
	¢ 1"	m	250.00		
	¢ 5/4"	m	170.00		
	¢ 6/4"	m	50.00		
	¢ 60,3	m	60.00		
	¢ 76,1	m	50.00		
	¢ 88,9	m	60.00		
6	• Coating of pipe lines, with two coats of finish varnish paint, consistent at operating temperature				
	¢ 3/8"	m	220.00		
	¢ 1/2"	m	570.00		
	¢ 3/4"	m	450.00		
	¢ 1"	m	250.00		
	¢ 5/4"	m	170.00		
	¢ 6/4"	m	50.00		
	¢ 60,3	m	60.00		
	¢ 76,1	m	50.00		
	¢ 88,9	m	60.00		
7	•Delivery and installation of radiator brackets, which must be fixed with cement mortar. 30% of existing brackets shall be delivered	pcs.	71.00		
8	•Delivery and installation of radiator spacers. 30% of existing spacers shall be replaced	pcs.	73.00		
9	•Installation of previously disassembled elements of the existing radiator heating installations: heaters, radiator valves and lockshield valves in amount of app. 30%	pcs.	121.00		
10	•Finishing works, trial tests, test of installations for 10 days, site clearance and handover of works	paušal	1.00		
	TOTAL ADDITION 1				

	ADDITION 2				
	Specification of works, estimated Bill of Quantities for dismantling of heating pipes, going from the substation to the annex, from the external facade of the building, and construction of a new heating pipeline in the false ceiling on the ground floor, from the substation to the annex, made of steel pipes ¢ 60.3 x 2.9 mm and isolation				
1	Dismantling of the existing heating pipeline 90/70°C, ¢60.3, insulated with mineral wool in Al sheet cladding, located on the exterior facade of the facility, at a height of about 5m, including use of scaffolding or hoist, transport costs out of the facility to 50 m of distance as determined by the Investor	m	100.00		
2	• Material supply and construction of heating pipeline 90/70°C, discharge and return line, made of certified black seamless pipes, under SRPS C. B5. 221, from the substation to the annex in the false ceiling of the ground floor, in High school in Obrenovac	m	200.00		
3	• Connecting parts, sealing material, fittings, metal bushings, oxygen, acetylene, welding wire, electrodes, anchors, brackets, and other small supplies, as well as openings through the walls for the passage of pipe heating network, including closure of openings after installation is completed and all other small supplies	paušal	1.00		
4	• Cleaning, degreasing, protection, painting in two coats by primer, two coats of finish, and preparation of pipeline for insulation	m	200.00		
5	• Testing of the pipeline on strength and water tightness	set	1.00		
6	•Delivery and installation of pipe insulation, thickness 13 mm, for insulating heating pipeline that passes through the false ceiling of the ground floor, together with glue and strip, produced by Armaflex or equivalent	m	200.00		

7	•Preparation for finishing works. Getting familiar with the facility, transport of tools, small construction works, site organization, site clearance and handover	LS	1.00		
8	•Development of As-built design for installations. The Investor shall be provided with three copies of the design	LS	1.00		
	TOTAL ADDITION 2				
	ADDITION 3				
	Specification of works, estimated Bill of Quantities for ventilation of chemistry classroom and locker rooms in the gymnasium				
1	Supply, delivery and installation of centrifugal duct fans for vertical or horizontal mounting, with circular connector for extraction from digester and ventilation of locker rooms in the gymnasium, the fans shall be supplied with appropriate elements for installation. Product: Solar & Palau Spain or equivalent type: VENT -160B L = 330 m³/h Δp= 115 Pa n= 2200 o/min N=70W – single-phase	pcs.	3.00		
2	Supply, delivery and installation of centrifugal duct fans for vertical or horizontal mounting, with circular connector for air extraction from chemistry classroom on the ground floor and first floor, the fans shall be supplied with appropriate elements for installation. Product : Solar & Palau Spain or equivalent type: VENT -200B L = 770 m³/h Δp= 60 Pa n= 2250 o/min N=125W – single-phase	pcs.	2.00		

3	Supply, delivery and installation of silencer, of circular cross-section, channel-mounted Product: Solar & Palau Spain or equivalent, type SIL 160	pcs.	5.00		
4	Delivery and installation of ceiling diffusers, square shape, for installation flush with ceiling. The diffusers are supplied complete with a plenum box with side air connection and flow regulator. The colour of ceiling diffuser according to the Investor's choice. Product: Trox Austria or equivalent DLQ –AK-M/300	pcs.	10.00		
5	Delivery and installation of ventilation valves with adjustable air flow Product Trox Austria or equivalent LVS 125	pcs.	3.00		
6	Delivery and installation of galvanized sheet channels of circular cross-section, as well as fittings, sheet thickness 0.6 mm, complete with all necessary materials for suspension, flanges, stiffeners and seals				
	¢ 100 mm	kg	100.00		
7	Preparations for finishing works: getting familiar with the site, surveying and marking, transport of tools, site organization. Finishing works: trial tests, required measuring and system control, trial operation, marking of installation elements, site clearance and handover of works	set	1.00		
8	Development of As-built design for installations. The Investor shall be provided with three copies of the design	set	1.00		
	TOTAL ADDITION 3				
	TOTAL ADDITION 1+2+3				
	TOTAL HEAT SUBSTATION + ADDITION 1,2,3				

GRAND SUMMARY

I	TOTAL CIVIL AND SPECIALIST'S WORKS GROUND FLOOR AND BASEMENT:
II	TOTAL CIVIL AND SPECIALIST'S WORKS ROOF ANEX:
III	W&S INSTALLATIONS
IV	ELECTRIC POWER INSTALLATIONS
V	TELECOMMUNICATION AND SIGNALING INSTALLATIONS
VI	FIRE DETECTION SYSTEM
VII	MECHANICAL INSTALLATIONS
	TOTAL: