

<b>PRICED BILL OF QUANTITIES</b>					
Building: RECONSTRUCTION OF CENTRAL HEATING IN STEFAN NEMANJA PRIMARY SCHOOL NOVI PAZAR					P10/2016
<b>CENTRAL HEATING BILL OF QUANTITIES</b>					
No.	Work description	UoM	Quantity	Unit price	Subtotal
<b>1</b>	<b>HEAT BODIES AND ACCESSORIES</b>				
1.1	Delivery and mounting of steel panel radiators, complete with supports and other accessories. The price shall include all fittings required to completely mount the radiator.				
a)	type 600/22 length:1600 mm	pcs.	2		
1.2	Delivery and mounting of air vent valves. Valves shall be mounted on all radiators. Venting shall be done by wrench or screwdriver and shall include an adjustable direction of the water jet, DN 15	pcs.	2		
1.3	Delivery and mounting of radiator regulating valves for a double pipe system with thermostatic head DN 15	pcs.	2		
1.4	Delivery and mounting of radiator screw-on caps. Screw-on caps shall be the closing type and shall be nickel plated, with a compulsory metal lid on the cap DN 15	pcs.	2		
1.5	Delivery and mounting of discharging ball valve DN 15	pcs.	2		
<b>HEAT BODIES AND ACCESSORIES TOTAL</b>					
<b>2</b>	<b>WORK ON THE EXISTING INSTALLATION</b>				
2.1	Dismounting of existing three-way automatic valves TV 065/63*	pcs.	3		
2.2	Dismounting of existing valves DN 65 PN 6 in the boiler room*	pcs.	12		
2.3	Dismounting, stripping insulation and manufacture of 2 new DN 100 connections; cutting off and sealing unnecessary connections; testing, reinsulating and remounting existing DN 200 collectors in total length of cca 2m. Everything completed	pcs.	2		
2.4	Dismounting of existing GHR 65 pumps in the boiler room*	pcs.	5		
2.5	Dismantling and removal of the existing expansion vessel with volume 2000 l from the boiler room* (cca. 1000 kg)	pcs.	1		

## BoQ MECHANICAL INSTALATION

No.	Work description	UoM	Quantity	Unit price	Subtotal
2.6	Chimney sweeping cleaning of chimney with issuing a certificate for 3 vertical tubes with dimensions of 300 * 600mm. The height of the chimney from the ground to the top is 12 m. The chimney has a gym up to the top.	pcs.	1		
2.7	Dismantling the existing ventilation grilles on the channel for drainage of smoke from the boiler room.	pcs.	1		
2.8	Dismounting and removal of existing light fuel oil boilers Podvis with capacity of 500 kW.* (cca. 1000 kg)	pcs.	2		
2.9	Dismounting of existing burners and parts of oil installation in the boiler room.*	pcs.	2		
2.10	Cutting off existing pipings in the boiler room to the connection points for the new parts of pipings. Lump sum.	pcs.	1		
Note: *temporary storage on school grounds					
<b>WORK ON THE EXISTING INSTALLATION TOTAL</b>					
<b>3 PIPINGS AND ACCESSORIES (FITTINGS &amp; VALVES)</b>					
3.1	Delivery and mounting of black seamless pipes according to SRPS EN 10216-1, material P235 TR1, including the required materials for connecting, fixing, load bearing, fixed and moving points, covers and bushings and/or fittings. Pipes shall be corrosion free and red lead coated twice.				
a)	DN 15 $\phi$ 21 * 2.3 mm	m	340		
b)	DN 20 $\phi$ 26.9 * 2.6 mm	m	370		
c)	DN 25 $\phi$ 33.7 * 2.6 mm	m	315		
d)	DN 32 $\phi$ 42.4 * 2.6 mm	m	240		
e)	DN 40 $\phi$ 48.3 * 2.6mm	m	60		
f)	DN 50 $\phi$ 60.3 *2.9mm	m	86		
g)	DN 65 $\phi$ 76.1 *2.9 mm	m	54		
h)	DN 80 $\phi$ 88.9 * 3.2 mm	m	260		
i)	DN 100 $\phi$ 108 * 3.6 mm	m	30		
3.2	Delivery and mounting of discharging valve DN 20	pcs.	2		
3.3	Delivery and mounting of pipe elbows ( SRPS EN 10253-1 material S235). Bend angle 90 deg., curve radius 1.5 d				
a)	DN 32 $\phi$ 42.4 * 2.6 mm	pcs.	50		
b)	DN 40 $\phi$ 48.3 * 2.6 mm	pcs.	16		
c)	DN 50 $\phi$ 60.3 *2.9mm	pcs.	10		
d)	DN 65 $\phi$ 76.1 *2.9 mm	pcs.	10		
e)	DN 80 $\phi$ 88.9 * 3.2 mm	pcs.	30		
f)	DN 100 $\phi$ 108 * 3.6 mm	pcs.	14		
3.4	Delivery and mounting butterfly valves PN 16 for hot water, complete with flanges, seals and screws.				
a)	DN100/16	pcs.	8		
b)	DN 80/16	pcs.	7		

## BoQ MECHANICAL INSTALATION

No.	Work description	UoM	Quantity	Unit price	Subtotal
c)	DN 50/16	pcs.	3		
3.5	Delivery and mounting of non-return valves. Mounting between flanges PN 16				
a)	DN 32/16	pcs.	1		
b)	DN 50/16	pcs.	2		
3.6	Delivery and mounting of balancing valve on return with metering instrument connections.				
a)	DN 15	pcs.	4		
b)	DN 20	pcs.	18		
c)	DN 25	pcs.	3		
d)	DN 32	pcs.	2		
e)	DN 50 PN 16	pcs.	1		
f)	DN 65 PN 16	pcs.	1		
3.7	Delivery and mounting of ball valves with discharge on both ends and internal thread PN 6				
a)	DN 15	pcs.	4		
b)	DN 20	pcs.	18		
c)	DN 25	pcs.	3		
d)	DN 32	pcs.	2		
e)	DN 40	pcs.	2		
3.8	Delivery of union flat joint PN 6				
a)	DN 15	pcs.	8		
b)	DN 20	pcs.	36		
c)	DN 25	pcs.	6		
d)	DN 32	pcs.	4		
3.9	Delivery of double nipples PN 6				
a)	DN 15	pcs.	8		
b)	DN 20	pcs.	38		
c)	DN 25	pcs.	6		
d)	DN 32	pcs.	4		
3.10	Delivery of WNRF flanges PN 16				
a)	DN 65/16	pcs.	16		
b)	DN 80/16	pcs.	8		
c)	DN 100/16	pcs.	8		
3.11	Delivery of flange sets, complete with seals and screws with nuts PN 16				
a)	DN 65/16	pcs.	10		
b)	DN 80/16	pcs.	8		
c)	DN 100/16	pcs.	6		
3.12	Delivery of WNRF flanges PN 6				
a)	DN 32/6	pcs.	8		
b)	DN 40/6	pcs.	4		
c)	DN 50/6	pcs.	12		
3.13	Delivery of flange sets, complete with seals and screws with nuts PN 6.				
a)	DN 32/6	pcs.	6		
b)	DN 40/6	pcs.	2		
c)	DN 50/6	pcs.	10		
d)	DN 65/6	pcs.	5		
3.14	Delivery and mounting of concentric reducers				
a)	DN 50/ DN 32	pcs.	4		
b)	DN 80/ DN 65	pcs.	2		

## BoQ MECHANICAL INSTALATION

No.	Work description	UoM	Quantity	Unit price	Subtotal
c)	DN 100/ DN 65	pcs.	2		
d)	DN 100/ DN 80	pcs.	2		
3.15	Delivery and mounting of various steel profiles for the purposes of console manufacture and suspension of the piping .	kg	300		
3.16	Delivery and mounting of circulation pump (1X230 V), a three-speed, for working condition Q =14 m <sup>3</sup> /h i H = 33kPa, <b>two working and one spare</b> for west and east side, type UPS 50-120 F or with equivalent technical characteristics of another manufacturer .	pcs.	3		
3.17	Delivery and mounting of circulation pump (3X400 V), a three-speed, for working condition Q =15,1m <sup>3</sup> /h i H = 22kPa,for boiler shunt, type UPS 50-60/4F or with equivalent technical characteristics of another producer.	pcs.	2		
3.18	Delivery and mounting of circulation pump (3X400 V), a three-speed, for working condition Q =7m <sup>3</sup> /h i H = 33kPa, <b>one working and one spare</b> for sports hall, type UPS 32-120F or with equivalent technical characteristics of another producer.	pcs.	2		
3.19	Delivery and mounting of elastic bands, rubber expansion joints, complete with flanges GU - KO				
a)	DN 32 NP 6	pcs.	2		
b)	DN 50 PN 6	pcs.	5		
3.20	Delivery and mounting of Y-strainer PN16.	pcs.			
a)	DN 50/16	pcs.	1		
b)	DN 80/16	pcs.	2		
c)	DN 100/16	pcs.	2		
<b>PIPINGS AND ACCESSORIES (FITTINGS &amp; VALVES) TOTAL:</b>					
<b>4</b>	<b>BOILER ROOM EQUIPMENT</b>				
4.1	Delivery and installation of the complete boiler system for heating hot water, the power of plant is 350 kW. The plant uses pellet as fuel.				

## BoQ MECHANICAL INSTALATION

No.	Work description	UoM	Quantity	Unit price	Subtotal
	<p>The boiler is provided with safety equipment according to requirements of EN 12828*. The scope of delivery of the boiler should include:</p> <ul style="list-style-type: none"> <li>• boiler with elevator (which throws a big-bag with pellets).</li> <li>• 500 kg container which receives the pellets from the elevator. The container can be fitted next to the boiler or in the boiler door.</li> <li>• burner with ceramic coating and cast bottom.</li> <li>• automatic cleaning system of the burner.</li> <li>• automatic cleaning system of the boiler with the coil at the bottom of the firebox for ash removal</li> <li>• External boiler ashtray.</li> <li>• Cyclone with a fan at the boiler flue outlet. The purpose of the cyclone is to separate the heavy particles.</li> <li>• Control unit for the each boiler (electronic control of all boiler functions)</li> <li>• conections for the supply and return piping have to be DN100 PN 16</li> </ul> <p>Napomena: * Safety valve DN 50 is given separately.</p> <p>Complete with commissioning and test run</p>				
		kom	2		
4.2	Delivery and mounting of the safety valve. The valve is spring-loaded with relief pressure of 4 bar, DN 50 complete with relief vessel.	pcs.	2		
4.3	<p>Delivery and installation of water pressure automatic control system for the heating installation with the pump:</p> <ul style="list-style-type: none"> <li>- Volume Court V = 800 lit</li> <li>- Maintaining pressure 2 - 4 bar.</li> </ul> <p>Complete with electrical cabinet and with connected system of the vessel.</p>	pcs.	1		
4.4	<p>Delivery of hand pallet truck.</p> <ul style="list-style-type: none"> <li>-load bearing capacity up to 250kg</li> <li>-width 550mm</li> <li>-fork length 1150mm</li> </ul>	pcs.	1		
4.5	<p>Delivery and mounting of flue duct to connect the boiler with the chimney. The flue duct shall be made of steel seamed pipes or formed thick sheet metal with min. thickness 2mm . Connection with the boiler and main flue duct shall be separable. The shape of the flue duct shall be adjusted to the mounting location</p>				
a)	Flue duct d= 220 mm L=1 m straight	pcs.	3		
b)	Elbow 90 d= 220 mm	pcs.	2		
4.6	Delivery and mounting of pipe thermometers D= 80 mm up to 120°C.	pcs.	12		
4.7	Delivery and mounting of pressure gauge for pressure up to 10 bar, D= 80 mm, complete with pressure gauge tap.	pcs.	2		

## BoQ MECHANICAL INSTALATION

No.	Work description	UoM	Quantity	Unit price	Subtotal
4.8	Manufacture and delivery of an air vent vessel made of steel pipes, complete with overflow connection DN15. Main dimension DN 150; L=250mm ( $\phi$ 150 x250mm).	pcs.	2		
4.9	Delivery and mounting of by-pass valve, straight or angled, complete with union flat joints for differential pressure 0.1 bar				
a)	DN 32 (5/4") PN 6	pcs.	3		
4.10	Delivery and mounting of discharging and air vent ball valve DN 15	pcs.	2		
4.11	Delivery and installation of overflow ventilation grills with dimensions 440 x 640mm. Grills are made in aluminum for installation in doors with a frame on both sides	pcs.	2		
<b>BOILER ROOM EQUIPMENT TOTAL:</b>					
<b>5 INSULATION AND PAINTING</b>					
5.1	Piping insulation with 50mm thick mineral wool in rolls coated by Al 0.5mm thick sheet metal. The item concerns the boiler room piping DN 65 up to DN 100. Per m2	m2	40		
5.2	Painting the visible parts of piping, holders and equipment using two coats of radiator varnish. Colour as selected by the Investor.	m	1650		
<b>INSULATION AND PAINTING TOTAL:</b>					
<b>6 AUTOMATIC CONTROL IN THE BOLER ROOM</b>					
	Delivery and installation for all items, with mandatory commissioning by authorized services and with the release of the warranty				
6.1	The main control module for connecting the module for the temperature control (for example Hoval TTE, Item No. : 6037073 or equivalent )	pcs.	2		
6.2	A module for regulating the temperature in a heating circuit (for example Hoval TTE-HK/WW article No.: 6034571 or equivalent)	pcs.	2		
6.3	Extension module for temperature control in the second heating circuit (for example Hoval TTE-FE HK article No.: 6034576 or equivalent)	pcs.	3		
6.4	Great size control cabinet for installation of the control modules, with an opening for the main control module	pcs.	1		
6.5	Middle size control cabinet for installation of the control modules, with an opening for the main control module	pcs.	1		
6.6	The outdoor temperature sensor, protection class: IPx4 (for example Hoval AF/2P/K, article No.: 2055889 or equivalent)	pcs.	1		

## BoQ MECHANICAL INSTALATION

No.	Work description	UoM	Quantity	Unit price	Subtotal
6.7	Threaded three way mixing valve DN 50 (2") (for example Hoval B3G460 article No.: 2039172 or equivalent)	pcs.	4		
6.8	Threaded three way mixing valve DN 32 (6/4") (for example Hoval B3G460 article No.: 2039171 or equivalent)	pcs.	1		
6.9	Servomotor to drive the three-way threaded mixing valves No. 6.7 & No. 6.8 (for example Hoval NR 230-20B article No.: 245209)	pcs.	5		
6.10	Timer to automatically turn on the boiler and adjusting the internal temperature.	pcs.	1		
<b>AUTOMATIC CONTROL IN THE BOLER ROOM TOTAL:</b>					
<b>7 WATER SOFTENING DEVICE</b>					
	Delivery and installation for all items, with mandatory commissioning by authorized services. Before purchasing the items required consultation with the supervisor or designer.				
7.1	Single device for water softening in automatic variant with associated piping and fittings for independent automatic operation Qmax = 1.8 m3 / h, min. volume 30 l	pcs.	1		
7.2	Water filter 1", cons-rinse, Qmax=1,8 m3/h	pcs.	1		
7.3	Mounting block with mixing valve to adjust the water hardness	pcs.	1		
7.4	Flexibile hose 1", for water softening device, 1 pair	pcs.	1		
7.5	Hardness tester of water, two bottles with jar	pcs.	1		
7.6	Salt tablets for water softeners, package of 1 kg	pcs.	25		
<b>WATER SOFTENING DEVICE TOTAL:</b>					
<b>8 OTHER WORKS</b>					
8.1	Internal transport materials and tools	lump sum	1		
8.2	Preparation and finish works, pressure testing with cold water and small necessary materials.	lump sum	1		
8.3	The regulation of the installation and its commissioning, functionality tests, installation balancing	lump sum	1		
8.4	Training of operating staff for a period of 3 days	lump sum	1		
8.5	Making of operating and maintaining instructions including the installations scheme in the boiler plant, format A1 framed and glazed.	lump sum	1		
8.6	Delivery of final (attest) documentation, technical books from the manufacturers of the equipment and warranty sheets	lump sum	1		
8.7	Making of as-built design	lump sum	1		

## BoQ MECHANICAL INSTALATION

No.	Work description	UoM	Quantity	Unit price	Subtotal
8.8	Supervision	lump sum	1		
8.9	Technical review	lump sum	1		
	<b>OTHER WORKS TOTAL:</b>				
	<b>SUMMARY- mechanical work</b>				
<b>1</b>	<b>HEAT BODIES AND ACCESSORIES</b>				
<b>2</b>	<b>WORK ON THE EXISTING INSTALLATION</b>				
<b>3</b>	<b>PIPINGS AND ACCESSORIES (FITTINGS &amp; VALVES)</b>				
<b>4</b>	<b>BOILER ROOM EQUIPMENT</b>				
<b>5</b>	<b>INSULATION AND PAINTING</b>				
<b>6</b>	<b>AUTOMATIC CONTROL IN THE BOLER ROOM</b>				
<b>7</b>	<b>WATER SOFTENING DEVICE</b>				
<b>8</b>	<b>OTHER WORKS</b>				
	<b>ALL MATERIALS &amp; WORKS TOTAL</b>				