BILL OF QUANTITIES FOR PARTIAL RECONSTRUCTION OF HEATING PIPELINES OF GENERAL HOSPITAL IN JAGODINA

ser. num	description	uom	quantity	unit price	total

NOTE: The prices of the bill include: supply, delivery and installation for each item of the bill unless otherwise described.
The obligation of the contractor prior to the beginning of execution of works determines the exact alignment of the existing heating system and on the basis of this knowledge access by removing the same and cutting asphalt.
When crossing with other installations comply with the minimum allowed distance, and if it is not possible, protect the installation according to technical conditions.
Surplus of soil after excavation to be loaded on trucks and transported to the designated landfill up to 10 km distant.
Disassembled elements to be packed, loaded on trucks and transported to the location designated by the beneficiary or landfill up to 10 km distant.

The Bidder shall price all items in the tender documentation excluding VAT.

I	**DISASSEMBLINGS**				
1.	Removal of the pre-insulated pipes for hot water including all the elements and fixed point and transport to the designated location:				
	Ø60,3x2,9 the outer diameter of pre-insulated pipes 125mm	m^1	19,00		
	Ø114,3x3,6 the outer diameter of pre-insulated pipes 140mm	m^1	438,00		
2.	Disassembling and removal of steel piping with insulation and transport to the designated location:				
	Ø168,3x4,5	m^1	114,00		
3.	Disassembling and removal of the valves and vent-desludge pots from manholes and transport to the designated location.	compl	2		
4.	Demolition and removal of the RC solid supports of the existing heating pipeline.	m^3	4,00		
	TOTAL DISASSEMBLINGS:				

II	**UNDERGROUND PRE-INSULATED HEATING PIPES**				
1.	Pre-insulated steel seamless pipes from Č.1212 JUS EN 253.2004 and JUS C B5.221. The pipes are delivered in lengths up to 12 m, with the following dimensions:				
	Ø60,3x2,9 the outer diameter of pre-insulated pipes 125mm	m^1	21,00		
	Ø114,3x3,6 the outer diameter of pre-insulated pipes 140mm	m^1	482,00		
2.	Addition to the quantity of pipes for pipe fittings, electrodes, technical gases for welding, wire for welding and other small supplies, charged 10% of the position of the pipes (pos. 1):		0,1		
3.	Steel pre-insulated bends R = 1,5D, angle of 90°, steel C1212 according to standard EN448.				
	Ø60,3x2,9	pcs	2		
	Ø114,3x3,6	pcs	26		
4.	Steel pre-insulated storey T branch, steel Č.1212 according to standard EN448.				
	DN100/50/50	pcs	2		
5.	Heat shrinkable sleeves (joints) with accessories (plastic handles, wires, sealing and vent plugs, polyurethane sealant for foaming and the like.), according to standard EN448.				
	DN50	pcs	8		
	DN100	pcs	98		
6.	Fixed point, thermally and electrically pre-insulated with a maximum permissible axial stress 185 N/mm2. At the points of entry and exit of pipes to and from the anchor block set the appropriate wall rings.				
	Ø114,3x3,6, the outer diameter of the steel plate 325mm	pcs	4		
7.	Polyurethane insulation of heating pipes and protection of electrical cables with polyethylene pipes of appropriate size in areas of their crossings in the trench. Execute according to the technical conditions for the crossings of these kinds of installation.	pcs	4		
8.	Delivery and installation of straight shut-off valves with counter flanges, screws, sealant for installation at the ends of the pipelines and for discharge in the shafts for NP 6 bar and temperature of 120° C.				
	DN100	pcs	4		

9	Desludge vessel with connectors for connection of pipelines to different consumers. The vessel is made of steel pipes. Connections to the vessel are of the following dimensions: DN150 NP6 - 1 piece DN100 NP6 - 2 pieces DN20 NP6 - 2 pieces Dimensions of the collectors are:				
	Diameter 273,0x6,3 length 800mm	pcs	2		
10	Ball valve for venting and discharge of desludge vessel.				
	DN20	pcs	4		
11.	End cap for mounting on the heating system after passing through the wall, to prevent the passage of moisture into the insulation of polyurethane foam.				
	DN 50	pcs	2		
	DN 100	pcs	4		
12	Steel seamless pipes according to SRPS C.B5.221. for protection of heating pipeline in the zone of passage under the road, of the length of 12m.				
	Ø267,1x6,3	m^1	12,00		
13.	Compensatory foam cushions for the purpose of facilitating of the movement of piping due to temperature dilatations of pipes set without channel.				
	Length 1m, width of 120mm and 40mm thick	pcs	50		
14.	Testing of executed sections of heating pipeline by radiographic control (20% of the welds) and with compressed air.	Flat rate			
15.	Geodetic surveying of the new route of underground heating pipelines to be entered in the cadastre of underground installations.	m^1	230,00		
	TOTAL UNDERGROUND PRE-INSULATED HEATING PIPES:				

III	**UNDERGROUND HEATING PIPES – CIVIL WORKS**				
1.	Excavation of trenches for laying of heating pipelines with average dimensions: width 1.0-1.2m, depth 1.0 – 1.5 m. The route of the trench must correspond to the urban technical conditions and design. Excavated material is deposited 1m from the edge of the trench. If other installations and facilities are encountered during excavation, the contractor is obliged to secure those, and to excavate soil in those areas manually. Item includes depositing of soil in the vicinity, rough levelling of the trench bottom, labour, securing of the trench with warning signs, protective fence to protect persons not employed on site, maintenance of the trench, as well as all other expenses on this item. Excavation will be done mechanically 90%, and 10% by hand, at the intersections with the existing installations. The calculation is per m3 of excavation.				
	mechanical excavation	m^3	300,00		
	manual excavation	m^3	45,00		
2.	Leveling of the bottom of the trench in, average width of 0.8 m, with fine-grain sand and setting of Styrofoam beams for heating installation, of 10x10cm, L = 1000 mm. Beams are placed at a distance of 3m.	m^1	200,00		
3.	Mechanical and manual filling of sand in the pipeline zone. Supply, transport and installation of clean fine-grain sand in the trench. After completing the installation of pipes, sand to be carefully backfilled at its sides with vibrating tamp device ("locust") or with the manual compactors with simultaneous lifting of the hull so that the appropriate contact was of sand and side of the trench is achieved. Filling to be carried out in layers of 10-20 cm with compaction of 90% according to Proctor up to the top of the pipes. Afterwards, the sand must be carefully manually backfilled and compacted to the level of 20cm above the pipe. The works must be carried out in full accordance with the conditions for installation of GRP and PVC pipes. Calculation per m3 of filled sand.	m^3	70,00		
4.	Attaching the strap of warning at 40cm from the pipe top.	m^1	230,00		

5.	Mechanical and manual filling of the remaining height of the trench (above sand) with material from excavation on the part of the route outside the road area where it the replacement of material is not required. Filling in layers of 30 cm, with vibrating tamp device ("locust") to the required compaction. Stone, brick, organic materials and the like must not be used as backfilling material. Calculation per m3 of the filled trench.	m^3	280,00		
6.	Reinforced concrete blocks MB 20 for the purpose of establishing of fixed points.	m^3	2,00		
7.	Cutting through layers of asphalt in the road zone and remake to its original condition in the width required for the installation of two pipes DN150 or DN100.	m^1	16,00		
8.	Placing poles for marking of heating pipeline routes. Poles are made of steel square pipe 18x18cm, must be 20 cm above the ground and 60 cm buried. Bronze plates 14x8cm with title "TOPLOVOD" anchored on top of the poles. Poles are placed at the intersection of pipelines with roads and at the points of change of direction of the pipes.	pcs	16		
	TOTAL UNDERGROUND HOT WATER PIPES – CIVIL WORKS:				
IV	**PREPARATORY AND FINISHING WORKS**				
1.	Preliminary work: introduction to the object, and measuring of labeling, transport tools, small construction works, organizing the site and familiarisation with the technical documentation.	Flat rate			
2.	Finishing works: Trial tests, regulation, the trial operation of the installation for a period of seven (7) days, production of instructions for handling and maintenance of the installations in three copies, marking elements of the installation, site clearance and delivery of the works.	Flat rate			
3	Geodetic and route marking for trench excavation for laying hot water and heating system for geodetic survey of Cadastral underground installations	m^1	230,00		
	TOTAL PREPARATION AND FINISHING WORKS:				

	SUMMARY:	
I	**DISASSEMBLINGS**	
II	**UNDERGROUND PRE-INSULATED HEATING PIPES**	
III	**UNDERGROUND HEATING PIPES – CIVIL WORKS**	
IV	**PREPARATORY AND FINISHING WORKS**	
	SUMMARY:	