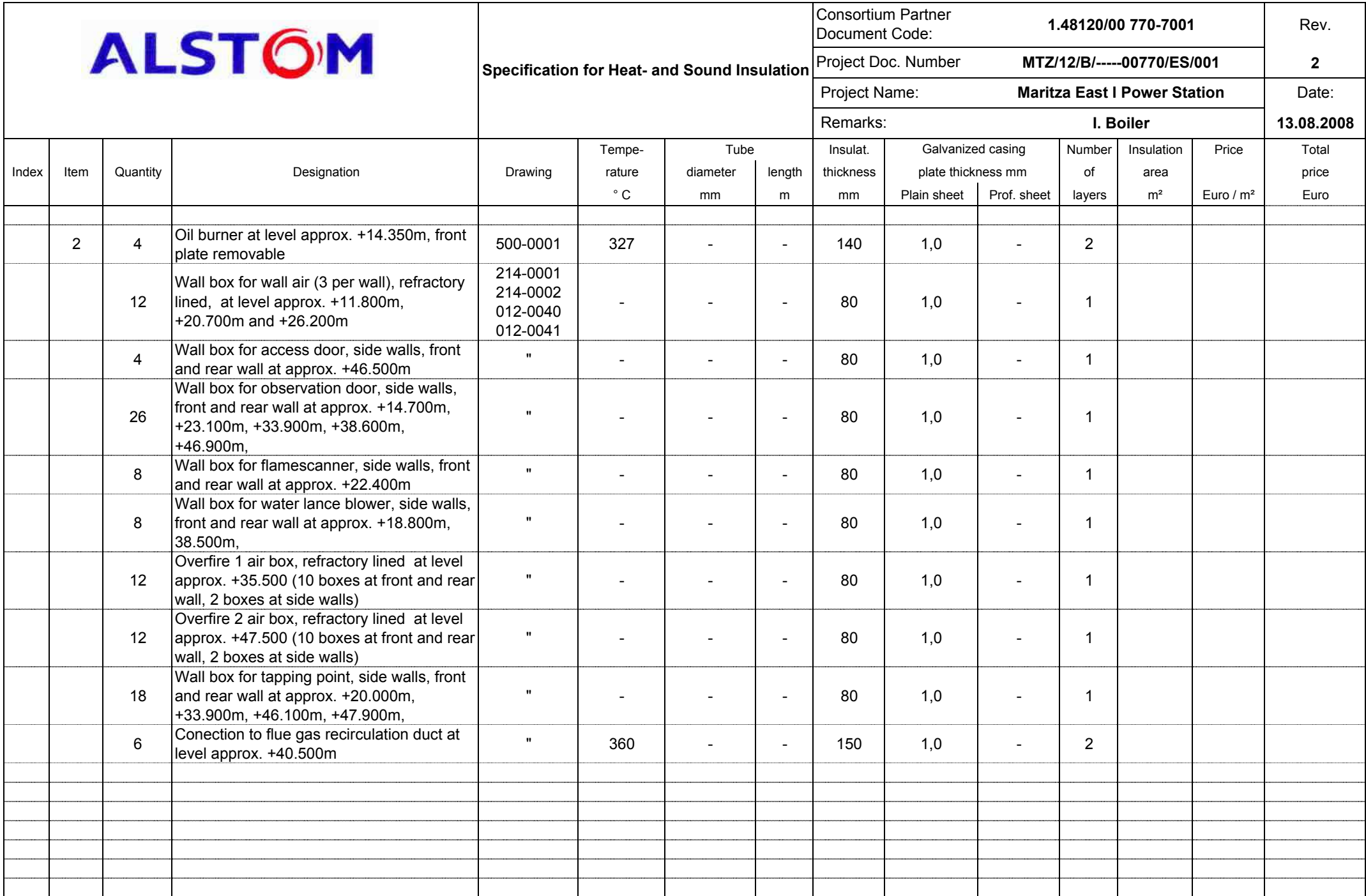


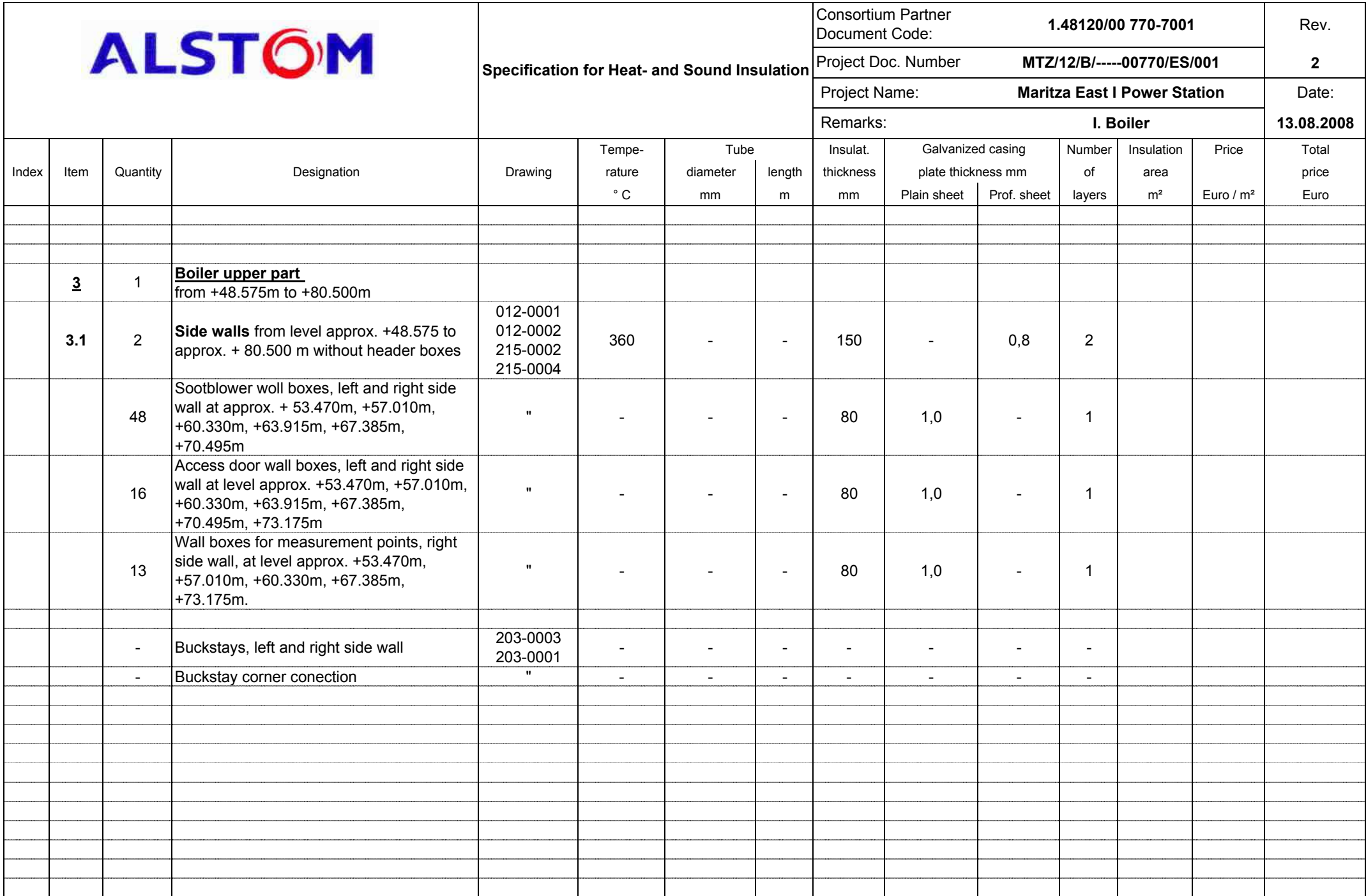


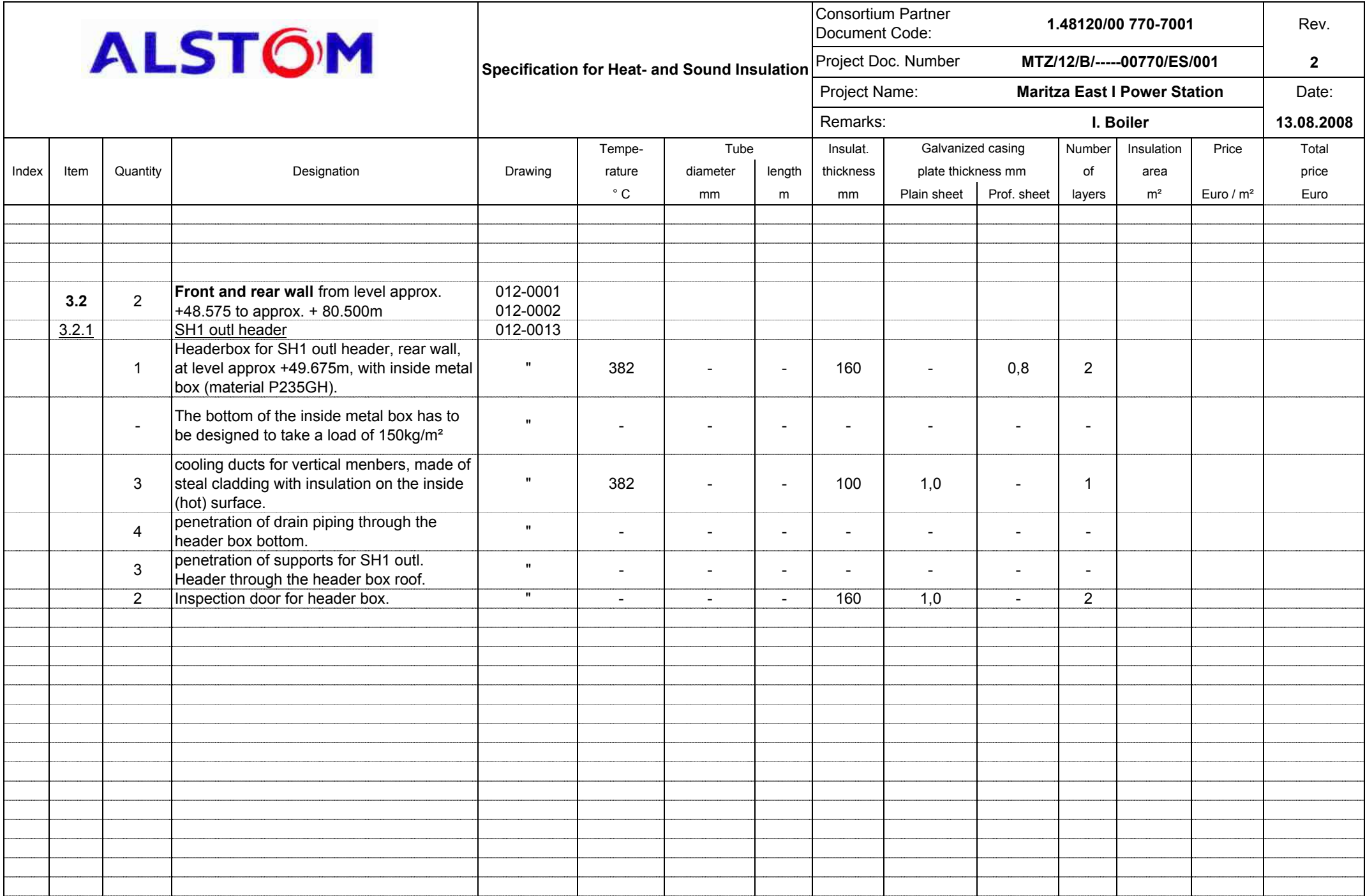
Specification for Heat- and Sound Insulation

Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	I. Boiler	13.08.2008


Index	Item	Quantity	Designation	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	1.2	2	Left and right side wall	214-0001 214-0002 214-0003										
		2	Inlet header at level approx. +0.450m	"	360	-	-	150	1,0	-	2			
		2	Horizontal tube pannel to side walls, at level approx. +0.900m (insulation on the top and botom surface)	"	360	-	-	150	1,0	-	2			
		2	side walls from level approx. +0.900m to +12.300m	"	360	-	-	150	-	0,8	2			
		-	Buckstays left and right side	-	-	-	-	-	-	-	-			
		-	Buckstay corner conection	-	-	-	-	-	-	-	-			
	2	1	<u>Boiler lower part</u> from +12.300m to +48.575m	214-0001 214-0002 012-0040 012-0041	360									
		4	Boiler walls from level approx. +12.300m to +48.575m	"	360	-	-	150	-	0,8	2			
		-	Buckstays, front and rear wall	-	-	-	-	-	-	-	-			
		-	Buckstays, left and right side wall	-	-	-	-	-	-	-	-			
		-	Buckstay corner conection	-	-	-	-	-	-	-	-			
		6	Tube oppening for main coal burner box at level approx. +15.735m	-	360	-	-	150	1,0	-	2			
1		6	Main burner wind box at level approx. +15.735m	-	327	-	-	140	1,0	-	2			
		6	Tube oppening for Reburning burner at level approx. +23.450m	-	360	-	-	150	1,0	-	2			
1		6	Reburning burner wind box at level approx. +23.450m	-	327	-	-	140	1,0	-	2			
		4	Tube oppening for oil burner, at level approx. +14.350m,	-	360	-	-	150	1,0	-	2			







<div>ALSTOM</div>				Specification for Heat- and Sound Insulation				Consortium Partner					Rev.	
								Document Code:						
								1.48120/00 770-7001						
				Project Doc. Number				MTZ/12/B/-----00770/ES/001					2	
				Project Name:				Maritza East I Power Station					Date:	
				Remarks:				I. Boiler					13.08.2008	
Index	Item	Quantity	Designation	Drawing	Tempe- rature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
									Plain sheet	Prof. sheet				
	3.2.2		SH3 inl, SH3 outl and FW outl. header	012-0011										
		1	Headerbox for SH3 inlet header, front wall, at level approx. +53.520m, with inside metal box (material P235GH)	"	460	-	-	220	-	0,8	2			
		-	The bottom of the inside metal box has to be designed to take a load of 150kg/m²	"	-	-	-	-	-	-	-			
		-	Attention! The insulation in the area of the downcomer pipes has to be adapted.	"	-	-	-	-	-	-	-			
1		3-4	cooling ducts for vertical members, made of steal cladding with microporous insulation material (13mm) on the inside (hot) surface. <i>(Pay attention on Boiler Thermal expansion)</i>	"	-	-	-	13	1,0	-	1			
		4	penetration of drain piping through the header box bottom.	"	-	-	-	-	-	-	-			
		2	Inspection door for header box.	"	-	-	-	220	1,0	-	2			
		3	penetration of supports for SH3 inll. header through the header box bottom.	"	-	-	-	-	-	-	-			
		1	sheet and insulation between SH3 inl. and SH3 outl. tubes (sheet material, 13CrMo4-5)	"	-	-	-	80	-	-	1			
		-	penetration of tubes from FW header.	"	-	-	-	-	-	-	-			

				Specification for Heat- and Sound Insulation				Consortium Partner Document Code: 1.48120/00 770-7001					Rev.	
								Project Doc. Number MTZ/12/B/-----00770/ES/001					2	
								Project Name: Maritza East I Power Station					Date:	
								Remarks: I. Boiler					13.08.2008	
Index	Item	Quantity	Designation	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
									Plain sheet	Prof. sheet				
	3.2.2	1	Headerbox for SH3 outl. header, front wall, at level approx. +57.050m, with inside metal box (material 13CrMo4-5)	012-0011	544	-	-	290	-	0,8	3			
1		3-4	cooling ducts for vertical members, made of steal cladding with microporous insulation material (13mm) on the inside (hot) surface. <i>(Pay attention on Boiler Thermal expansion)</i>	"	-	-	-	13	1,0	-	1			
		2	penetration of vent piping through the header box roof.	"	-	-	-	-	-	-	-			
		4	penetration of suppurts for SH3 outl. Header through the header box roof.	"	-	-	-	-	-	-	-			
		4	penetration of suppurts for front wall header through the header box roof.	"	-	-	-	-	-	-	-			
		2	Inspection door for header box	"	-	-	-	-	-	-	-			
		2	Penetration of bucstays through the side walls	"	-	-	-	-	-	-	-			
		4	Penetration for piping to FW header through the header box roof.	"	-	-	-	-	-	-	-			
		1	FW header , inside the Insulation box for SH3 inl. and SH3 outl. at level approx. +57.510m.	012-0015	360	-	-	-	-	-	-			
		2	Caps for inspection stubs	"	360	-	-	150	1,0	-	2			

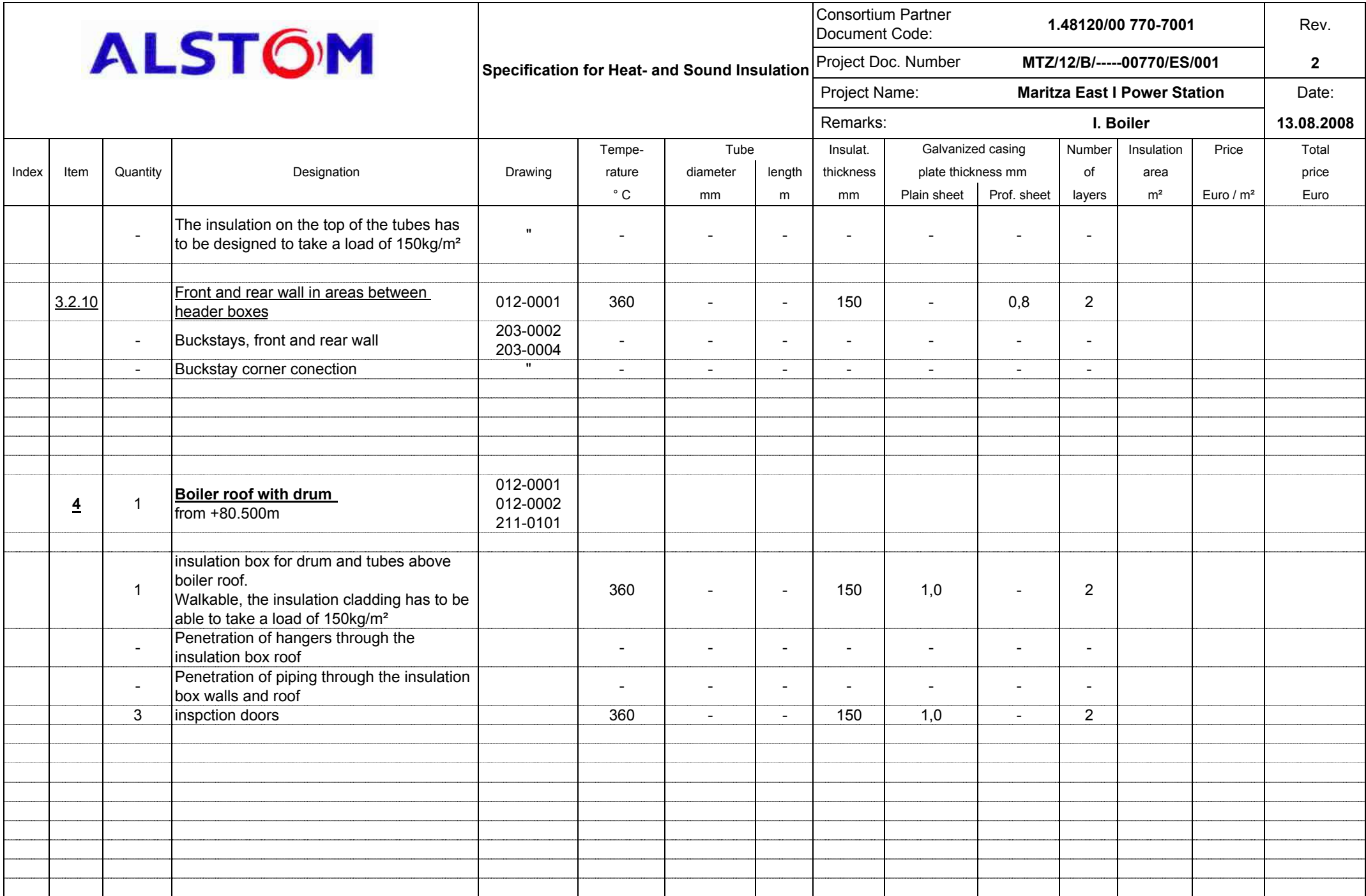
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								Project Doc. Number MTZ/12/B/-----00770/ES/001					2	
								Project Name: Maritza East I Power Station					Date:	
								Remarks: I. Boiler					13.08.2008	
Index	Item	Quantity	Designation	Drawing	Tempe- rature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet Prof. sheet		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	3.2.3		RH2 inl, RH2 outl and RW outl. header	012-0013										
		1	Headerbox for RH2 inlet header, rear wall, at level approx. +56.870m, with inside metal box (material P235GH)	"	415	-	-	190	-	0,8	2			
		-	The bottom of the inside metal box has to be designed to take a load of 150kg/m²	"	-	-	-	-	-	-	-			
		-	Attention! The insulation in the area of the steel structure has to be adapted.	"	-	-	-	-	-	-	-			
		3	cooling ducts for vertical menbers, made of steal cladding with microporous insulation material (13mm) on the inside (hot) surface. <i>(Pay attention on Boiler Thermal expansion)</i>	"	-	-	-	13	1,0	-	1			
		4	penetration of drain piping through the header box bottom.	"	-	-	-	-	-	-	-			
		2	Inspection door for header box	"	-	-	-	190	1,0	-	2			
		2	Penetration of bucstays through the side walls	"	-	-	-	-	-	-	-			
		4	penetration for piping to RW header through the header box roof.	012-0015	-	-	-	-	-	-	-			
		1	sheet and insulation between RH2 inl. and RH2 outl. tubes (sheet material, 13CrMo4-5)	012-0013	-	-	-	80	-	-	1			

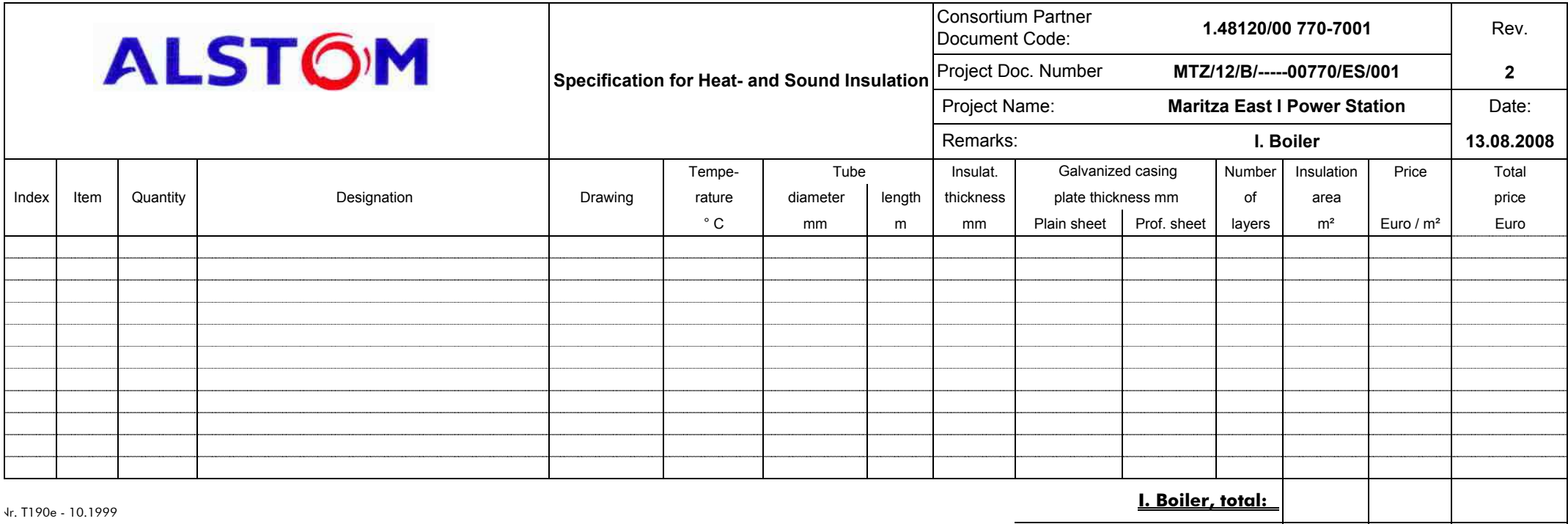
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								Document Code: 1.48120/00 770-7001						
								Project Doc. Number MTZ/12/B/-----00770/ES/001						
								Project Name: Maritza East I Power Station						
								Remarks: I. Boiler					13.08.2008	
Index	Item	Quantity	Designation	Drawing	Tempe- rature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
									Plain sheet	Prof. sheet				
	3.2.3	1	Headerbox for RH2 outl. header, rear wall, at level approx. +60.470m, with inside metal box (material 13CrMo4-5)	012-0013	544	-	-	290	-	0,8	3			
		3	cooling ducts for vertical menbers, made of steal cladding with microporous insulation material (13mm) on the inside (hot) surface. <i>(Pay attention on Boiler Thermal expansion)</i>	"	-	-	-	13	1,0	-	1			
		4	penetration of vent piping through the header box roof.	"	-	-	-	-	-	-	-			
		4	penetration of suppurts for RH2 outl. Header through the header box roof.	"	-	-	-	-	-	-	-			
		2	Inspection door for header box.	"	-	-	-	290	1,0	-	3			
		2	Penetration of bucstays through the side walls	"	-	-	-	-	-	-	-			
		1	RW header , inside the Insulation box for RH2 inl. and RH2 outl. at level approx. +58.070m.	012-0015	360	-	-	-	-	-	-			
		2	Caps for inspection stubs	"	360	-	-	150	1,0	-	2			
	3.2.4		SH2 outl. header	012-0011										
		1	Headerbox for SH2 outl. header, front wall, at level approx. +60.190m, with inside metal box (material P295GH)	"	481	-	-	240	-	0,8	2			
		-	The bottom of the inside metal box has to be designed to take a load of 150kg/m²	"	-	-	-	-	-	-	-			

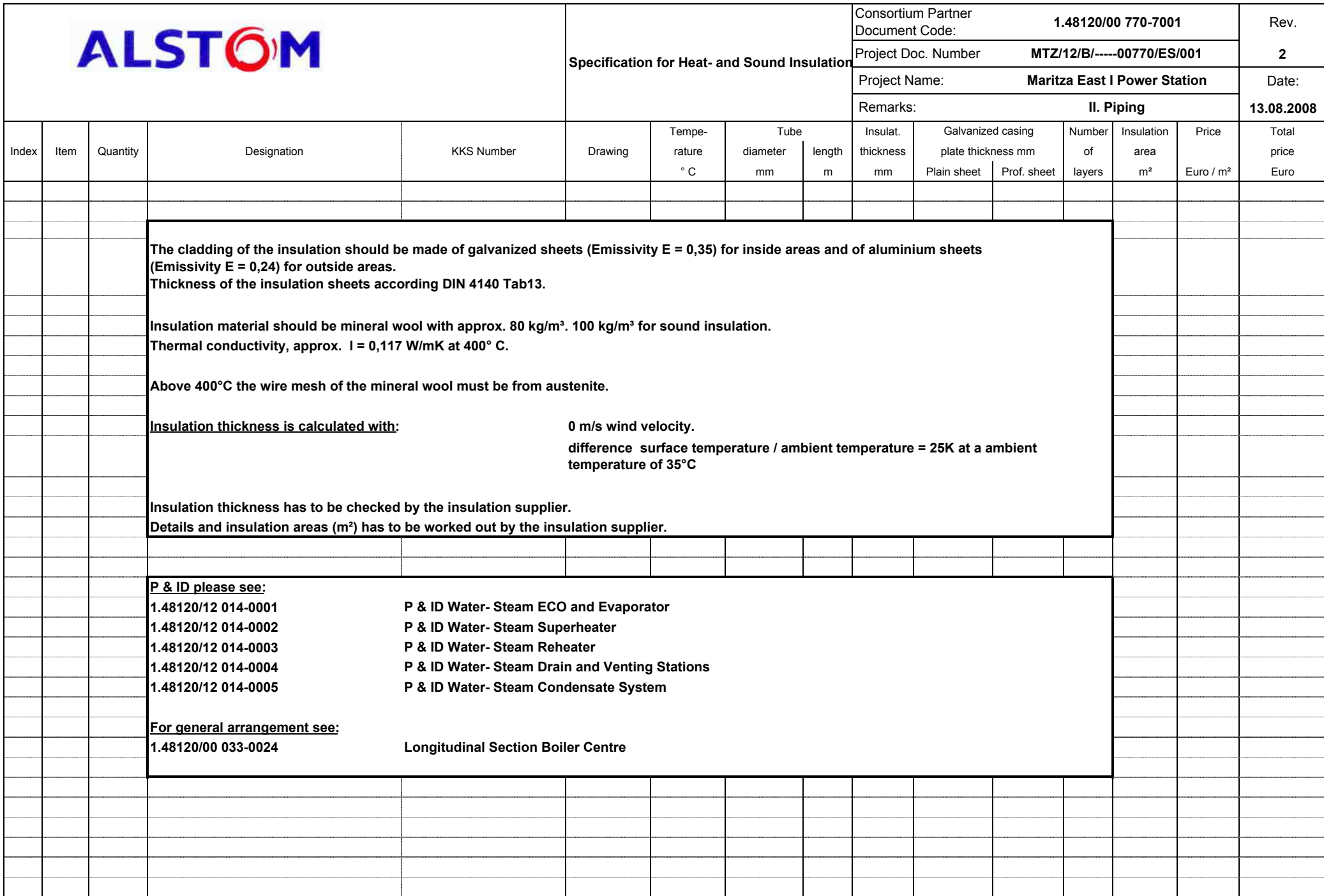
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								Document Code:						
								1.48120/00 770-7001						
								Project Doc. Number						
				MTZ/12/B/-----00770/ES/001					2					
				Project Name:					Maritza East I Power Station	Date:				
				Remarks:					I. Boiler	13.08.2008				
Index	Item	Quantity	Designation	Drawing	Tempe- rature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		4	penetration of drain piping through the header box bottom.	"	-	-	-	-	-	-	-			
		4	caps for inspection nozzles	"	481	-	-	240	1,0	-	2			
		4	penetration of suppurts for SH2 outl. Header through the header box roof.	"	-	-	-	-	-	-	-			
		2	Inspection door for header box	"	481	-	-	240	1,0	-	2			
	3.2.5		SH2 inl. header	012-0011										
		1	Headerbox for SH2 inl. header, front wall, at level approx. +64.140m, with inside metal box (material P235GH)	"	374	-	-	160	-	0,8	2			
		4	penetration of vent piping through the header box roof.	"	-	-	-	-	-	-	-			
		4	caps for inspection nozzles	"	374	-	-	160	1,0	-	2			
		4	penetration of suppurts for SH2 inl. Header through the header box roof.	"	-	-	-	-	-	-	-			
		2	Inspection door for header box	"	374	-	-	160	1,0	-	2			
	3.2.6		RH1 inl. and RH1 outl. header	012-0014										
1		1	Headerbox for RH1 outl. header, rear wall, at level approx. +63.400m +63,690m, with inside metal box (material P235GH)	"	442	-	-	210	-	0,8	2			
		-	The bottom of the inside metal box has to be designed to take a load of 150kg/m²	"	-	-	-	-	-	-	-			
		4	penetration of drain piping through the header box bottom.	"	-	-	-	-	-	-	-			
		2	Inspection door for header box	"	442	-	-	210	1,0	-	2			
				"										

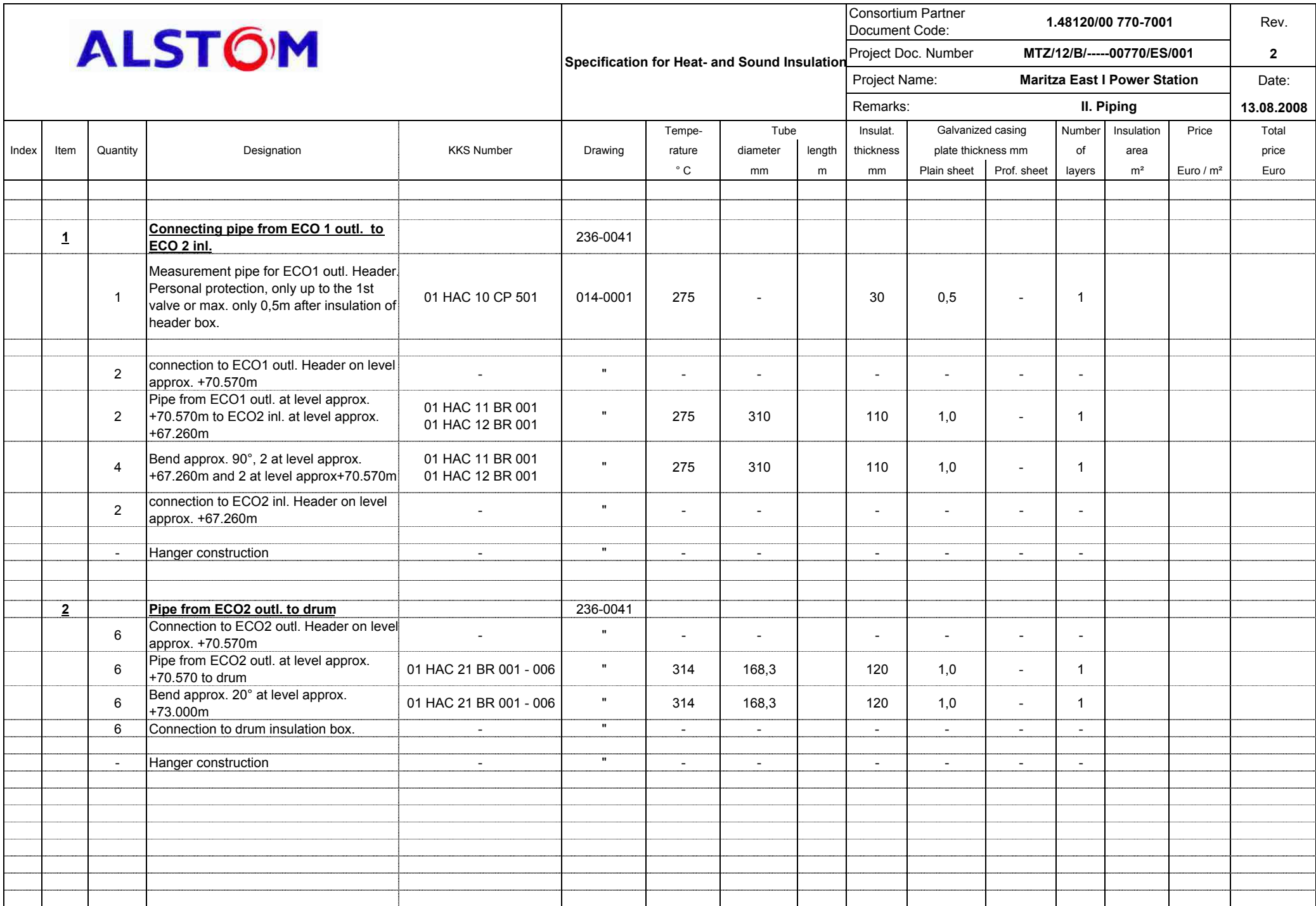
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								Project Doc. Number MTZ/12/B/-----00770/ES/001					2	
								Project Name: Maritza East I Power Station					Date:	
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Index	Item	Quantity	Designation	Drawing	Tempe- rature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet Prof. sheet		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	sheet and insulation between RH1 inl. and RH1 outl. tubes (sheet material, P235GH). The saparation of the header boxes must be below the hanger beam for RH1 outl. Header	"	-	-	-	80	-	-	1			
	3.2.6	1	Headerbox for RH1 inl. header, rear wall, at level approx. +67.610m, with inside metal box (material P235GH)	012-0014	340	-	-	130	-	0,8	2			
		4	penetration of vent piping through the header box roof.	"	-	-	-	-	-	-	-			
		4	penetration of suppurts for RH1 inl. Header through the header box roof.	"	-	-	-	-	-	-	-			
		2	Inspection door for header box	"	340	-	-	130	1,0	-	2			
		2	Penetration of bucstays through the side walls	"	-	-	-	-	-	-	-			
		3	Penetration of hangerbeam through the rear wall.	"	-	-	-	-	-	-	-			
	<u>3.2.7</u>		ECO2 inl. header	012-0012										
		1	Headerbox for ECO2 inl. header, front wall, at level approx. +67.260m, with inside metal box (material P235GH)	"	275	-	-	100	-	0,8	1			
		-	The bottom of the inside metal box has to be designed to take a load of 150kg/m²	"	-	-	-	-	-	-	-			
		4	penetration of drain piping through the header box bottom.	"	-	-	-	-	-	-	-			
		4	penetration of suppurts for ECO 2 inl. Header through the header box roof.	"	-	-	-	-	-	-	-			

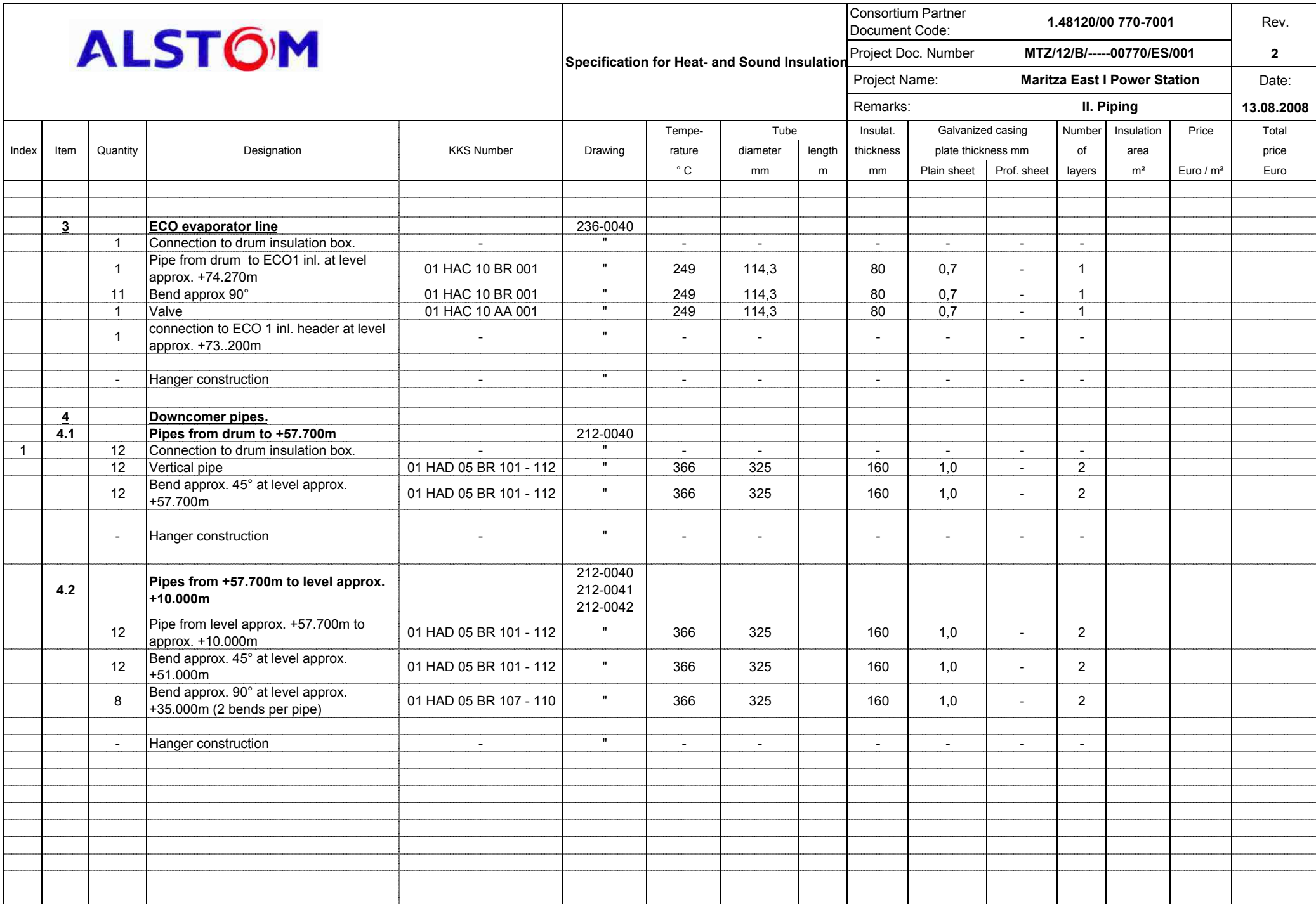
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Index	Item	Quantity	Designation	Drawing	Tempe- rature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet Prof. sheet		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		2	Inspection door for header box	"	275	-	-	100	1,0	-	1			
	3.2.8		ECO1 outl. and ECO2 outl. header	012-0012										
		1	Headerbox for ECO2 outl. header and ECO1 outl. header front wall, at level approx. +70.570m, with inside metal box (material P235GH)	"	313	-	-	120	-	0,8	1			
		-	Attention! The insulation in the area of the downcomer pipes has to be adapted.	"	-	-	-	-	-	-	-			
		6	Penetration of piping from ECO2 outl to drum through the header box roof	"	-	-	-	-	-	-	-			
		2	Inspection door for header box	"	313	-	-	120	1,0	-	1			
		2	caps for inspection stubs (ECO2 outl.)	"	313	-	-	120	1,0	-	1			
		4	penetration of supports for ECO1 outl. header through the header box roof.	"	-	-	-	-	-	-	-			
	3.2.9		ECO1 inl. header	012-0012										
		1	ECO1 inl. header at level approx. +73.200m	"	249	-	-	80	-	0,8	1			
		8	caps for inspection stubs	"	249	-	-	80	1,0	-	1			
		1	connection for evaporator line	"	-	-	-	-	-	-	-			
		4	supports for ECO1 inl. header	"	-	-	-	-	-	-	-			
		1	Bundle tube insulation for ECO1 inl. piping.	"	249	-	-	80	-	0,8	1			











Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
1	4.3		Pipes from level approx. +10.000m to headers		212-0042										
	4.3.1		<u>Pipes to front wall headers</u>												
		3	Pipe to front wall header	01 HAD 05 BR 101 - 103	"	366	325		160	1,0	-	2			
		6	Bend approx. 90° (2 bends per pipe)	01 HAD 05 BR 101 - 103	"	366	325		160	1,0	-	2			
		3	Bend approx. 30°	01 HAD 05 BR 101 - 103	"	366	325		160	1,0	-	2			
		3	Connection to front wall header, 2 headers at level approx. +3.300m, and 1 header at level approx. +0.450m	-	"	-	-		-	-	-	-			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	4.3.2		<u>Pipes to left side wall header</u>												
		3	Pipe to left side wall header	01 HAD 05 BR 104 - 106	"	366	325		160	1,0	-	2			
		6	Bend approx. 90° (2 bends per pipe)	01 HAD 05 BR 104 - 106	"	366	325		160	1,0	-	2			
		3	Bend approx. 20°	01 HAD 05 BR 104 - 106	"	366	325		160	1,0	-	2			
		3	Bend approx. 30°	01 HAD 05 BR 104 - 106	"	366	325		160	1,0	-	2			
		3	Connection to left side wall header, at level approx. +0.450m	-	"	-	-		-	-	-	-			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	4.3.3		<u>Pipes to rear wall headers</u>												
		3	Pipe to rear wall header	01 HAD 05 BR 107 - 109	"	366	325		160	1,0	-	2			
		6	Bend approx. 90° (2 bends per pipe)	01 HAD 05 BR 107 - 109	"	366	325		160	1,0	-	2			
		3	Bend approx. 30°	01 HAD 05 BR 107 - 109	"	366	325		160	1,0	-	2			
		3	Connection to rear wall header, 2 headers at level approx. +3.300m, and 1 header at level approx. +0.450m	-	"	-	-		-	-	-	-			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	4.3.4		<u>Pipes to right side wall header</u>												
		3	Pipe to right side wall header	01 HAD 05 BR 110 - 112	"	366	325		160	1,0	-	2			
		6	Bend approx. 90° (2 bends per pipe)	01 HAD 05 BR 110 - 112	"	366	325		160	1,0	-	2			
		2	Bend approx. 20°	01 HAD 05 BR 110 - 112	"	366	325		160	1,0	-	2			
		3	Bend approx. 30°	01 HAD 05 BR 110 - 112	"	366	325		160	1,0	-	2			
		3	Connection to right side wall header, at level approx. +0.450m	-	"	-	-		-	-	-	-			
		-	Hanger construction	-	"	-	-		-	-	-	-			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	5		Overflow pipes												
	5.1		Overflow pipes front wall												
		4	connection to Evaporator outl. Header from wall at level approx. +57.510m	-	215-0140	-	-		-	-	-	-			
		4	Pipe from EVA outl. header to Drum	01 HAD 10 BR 001 - 004	"	366	219		150	1,0	-	2			
		2	Bend approx. 45° at level approx. +59.000m	01 HAD 10 BR 002, 003	"	366	219		150	1,0	-	2			
		16	Bend approx. 45°	01 HAD 10 BR 001 - 004	"	366	219		150	1,0	-	2			
		4	Connection to drum insulation box.	-	"	-	-		-	-	-	-			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	5.2		Overflow pipes rear wall												
		4	connection to Evaporator outl. Header rear wall at level approx. +58.070m	-	215-0021	-	-		-	-	-	-			
		4	Pipe from EVA outl. header to insulation box boiler roof / drum	01 HAD 30 BR 001 - 004	"	366	219		150	1,0	-	2			
		4	Bend approx. 90° at level approx. +82.500m	01 HAD 30 BR 002, 003	"	366	219		150	1,0	-	2			
		4	Connection to insulation box boiler roof / drum	-	"	-	-		-	-	-	-			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	6		Connecting pipe from SH1 outl. to SH2 inl.												
	6.1		Pipe from SH1 outl. to spray cooler		226-0040										
		2	connection to SH1 outl. Header at level approx. +49.675m	-	"	-	-		-	-	-	-			
		2	Pipe from SH1 outl. header to spray cooler	01 HAH 11, 12 BR 001	"	382	297		170	1,0	-	2			
		4	Bend approx. 90°	01 HAH 11, 12 BR 001	"	382	297		170	1,0	-	2			
		2	Flow Measurement	01 HAH 11, 12 CF 001	"	382	297		170	1,0	-	2			
		4	Measurement points (2 Measurements per pipe)	01 HAH 11, 12 CT 001, 501	"	-	-		-	-	-	-			
		2	Pressure Measurement pipe <i>Personal protection, only up to the 1st valve or max. only 0,5m after main pipe..</i>	01 HAH 11, 12 CP001	"	382	-		30	0,5	-	1			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		-	Hanger construction	-	"	-	-		-	-	-	-			
	6.2		Spray cooler		226-0040										
		2	spray cooler (vertical) from level approx. +52.800 to approx. +57.800m	01 HAH 11, 12 AC 001	"	382	289		170	1,0	-	2			
	6.3		Pipe from spray cooler to SH2 inl. header		226-0040										
		2	Pipe from spray cooler to SH2 inl. header	01 HAH 11, 12 BR 002	"	374	289		160	1,0	-	2			
		4	Bend approx. 90°	01 HAH 11, 12 BR 002	"	374	289		160	1,0	-	2			
		2	Bend approx. 45°	01 HAH 11, 12 BR 002	"	374	289		160	1,0	-	2			
		6	Measurement points (3 Measurements per pipe)	01 HAH 11, 12 CT 002, 502, 503	"	-	-		-	-	-	-			
		2	Connection to SH2 inl. header at level approx. +64.140m	-	"	-	-		-	-	-	-			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	7		Connecting pipe SH2 outl. to SH3 inl.												
	7.1		Pipe from SH2 outl. to spray cooler		226-0040										
		2	connection to SH2 outl header. at level approx. +60.100m	-	"	-	-		-	-	-	-			
		2	Pipe from SH2 outl. header to spray cooler	01 HAH 21, 22 BR 001	"	480	350		240	1,0	-	2			
		6	Measurement points (3 Measurements per pipe)	01 HAH 21, 22 CT 001, 002, 501	"	-	-		-	-	-	-			
		4	Bend approx. 90°	01 HAH 21, 22 BR 001	"	480	350		240	1,0	-	2			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	7.2		Spray cooler		226-0040										
		2	spray cooler (vertical) from level approx. +52.800 to approx. +57.800m	01 HAH 21, 22 AC 001	"	480	350		240	1,0	-	2			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	7.3		Pipe from spray cooler to SH3 inl. header		226-0040										
		2	Pipe from spray cooler to SH3 inl. header	01 HAH 21, 22 BR 002	"	461	330		220	1,0	-	2			
		8	Bend approx. 90°	01 HAH 21, 22 BR 002	"	461	330		220	1,0	-	2			
		6	Measurement points (3 Measurements per pipe)	01 HAH 21, 22 CT 003, 004, 502	"	-	-		-	-	-	-			
		2	Connection to SH3 inl. header at level approx. +53.520m	-	"	-	-		-	-	-	-			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	8		Connecting pipe RH1 outl. to RH2 inl.												
	8.1		Pipe from RH1 outl. to spray cooler		246-0040										
		2	Connection to RH1 outl header at level approx. +63.581m	-	"	-	-		-	-	-	-			
		2	Pipe from RH1 outl header to spray cooler	01 HAJ 11, 12 BR 001	"	443	566		230	1,0	-	2			
		2	Measurement points	01 HAJ 11, 12 CT 001	"	-	-		-	-	-	-			
		3	Bend approx. 90° (1 for HAJ11 and 2 for HAJ12)	01 HAJ 11, 12 BR 001	"	443	566		230	1,0	-	2			
		1	Bend approx. 45°	01 HAJ 11 BR 001	"	443	566		230	1,0	-	2			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	8.2		Spray cooler		246-0040										
		2	spray cooler (vertical) HAJ11: from level approx. +60.510 to approx. +55.510m, HAJ12 from level approx. +61.425m to approxs. +56.425m	01 HAJ 11, 12 AC 001	"	443	566		230	1,0	-	2			

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	8.3		Pipe from spray cooler to RH2 inl header		246-0040										
		2	Pipe from spray cooler to RH2 inl header	01 HAJ 1, 12 BR 002	"	415	560		210	1,0	-	2			
		1	Bend approx. 45°	01 HAJ 12 BR 002	"	415	560		210	1,0	-	2			
		6	Bend approx. 90° (3 bends per pipe)	01 HAJ 11, 12 BR 002	"	415	560		210	1,0	-	2			
		2	Connection for sootblower piping	-	"	-	-		-	-	-	-			
		4	Measurement points	01 HAJ 11, 12 CT 002, 003	"	-	-		-	-	-	-			
		3	Pressure Measurement pipe for RH2 outl. header Personal protection, max. only 0,5m after header box insulation.	01 HAJ 20 BR 201 - 203	014-0003	415	-		30	0,5	-	1			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	9		Start up pipe		253-0040										
		1	Connection to drum insulation box.	-	"	-	-		-	-	-	-			
		1	Pipe from drum at level approx. +80.985m to flash tank at level approx. +8.708m	01 LCQ 20 BR 001	"	366	219,1		150	1,0	-	2			
		16	Bend approx. 90°	01 LCQ 20 BR 001	"	366	219,1		150	1,0	-	2			
		6	Bend approx. 20°	01 LCQ 20 BR 001	"	366	219,1		150	1,0	-	2			
		1	Valve at level approx. +8.708m	01 LCQ 20 AA 001	"	366	219,1		150	1,0	-	2			
		1	Valve at level approx. +8.708m Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between valve and cladding with elasticated spacing web. The drive of the valves must be protected	01 LCQ 20 AA 002	"	366	219,1		70	1,0	-	1			
		1	connection to flash tank	-	"	-	-		-	-	-	-			
		-	Hanger construction	-	-	-	-		-	-	-	-			

Consortium Partner	1.48120/00 770-7001	Rev.
Document Code:		
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	II. Piping	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	10		Flash Tank (IBD)												
	10.1		Flash Tank		014-7501 291-0040										
		1	Flash Tank Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between valve and cladding with elasticated spacing web.	01 LCL 01 BB 001	"	180	1700		70	1,0	-	1			
		1	Pressure Measurement LCL01CP001 Pressure Measurement pipe Personal protection, only up to the 1st valve or max. only 0,5m after piping.	01 LCL 01 BR	"	180	-		30	0,5	-	1			
		1	Access door pay attention on sound insulation	-	"	-	-		70	1,0	-	1			
	10.2		Blow off line		253-0041										
		1	Pipe from flash tank at level approx. +9.730m to roof penetration Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between valve and cladding with elasticated spacing web.	01 LCL 01 BR 011	"	180	730		70	1,0	-	1			
		1	connection for pipe from CBD Tank.	-	"	-	-		-	-	-	-			
		1	connection for pipe from Condensate Tank	-	"	-	-		-	-	-	-			

Consortium Partner	1.48120/00 770-7001	Rev.
Document Code:		
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	II. Piping	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m ²	Price Euro / m ²	Total price Euro
		2	Bend approx. 90° at level approx. +43.000m and at +43.400m <i>Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between valve and cladding with elasticated spacing web.</i>	01 LCL 01 BR 011	"	180	730		70	1,0	-	1			
		1	Rain fender at roof penetration	-	"	-	-		-	-	-	-			
	10.2	1	Blow off line outside boiler house <i>Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.2mm aluminium sheet cladding with anti boom material (approx. 3,6kg/m²) 100 mm distance between valve and cladding with elasticated spacing web.</i>	01 LCL 01 BR 001	253-0041	180	730		70	Al 1,2	-	1			
		1	Silencer at level approx. +93.400m <i>Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.2mm aluminium sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between silencer and cladding with elasticated spacing web.</i>	01 LCL 01 BS 001	"	180	-		70	Al 1,2	-	1			
		-	Hanger construction <i>pay attention on sound insulation</i>	-	-	-	-		-	-	-	-			
	10.3		Drain lance		291-0040										
		1	Drain lance, upstream valve LCL01AA001	01 LCL 01 BR 001		366	101,6		110	1,0	-	1			
		1	Drain lance, downstream valve LCL01AA001 <i>Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between valve and cladding with elasticated spacing web.</i>	01 LCL 01 BR 001		195	193		70	1,0	-	1			

Consortium Partner	1.48120/00 770-7001	Rev.
Document Code:		
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	II. Piping	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	Valve Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between valve and cladding with elasticated spacing web. The drive of the valves must be protected	01 LCL 01 AA 001		195	193		70	1,0	-	1			
	10.3	1	Drain lance Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between valve and cladding with elasticated spacing web.	01 LCL 01 BR 002	291-0040	180	114,3		70	1,0	-	1			
	10.4		Pipe from feedwater tank overflow		014-0004										
		1	Pipe from feedwater tank overflow Personal protection only in the areas of cable ways and platforms	01 LAA 05 BR 020		180	114,3		60	0,6	-	1			
	10.5		Pipe from venting station		014-0004										
			Personal protection only, approx 3m before IBD tank.												
		1	Pipe	01 HAN 30BR 002		-	-		approx. 60	0,6	-	1			
	11		CBD tank												
	11.1		CBD tank		014-7501 257-0042										
		1	CBD tank Personal protection only in the areas of cable ways and platforms.	01 LCL 02 BB 001	"	215	300		80	1,0	-	1			
		1	Pressure Measurement LCL02CP001 Personal protection, only to the 1st Valve or max. only 0,5m after piping.	01 LCL 02 BR ...	"	215	-		30	0,5	-	1			

Consortium Partner	1.48120/00 770-7001	Rev.
Document Code:		
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	II. Piping	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		2	Level measurement LCL02CL001 <i>Personal protection, only to the 1st Valve or max. only 0,5m after piping.</i>	01 LCL 02 BR ...	"	215	-		30	0,5	-	1			
		-	Support construction	-	"	-	-			-					
	11.2		CBD Tank Savety Valve		257-0042										
		1	Safety valve at level approx. +13.806m <i>Personal protection only in the areas of cable ways and platforms.</i>	01 LCL 02 AA 001	"	180	168,3		60	0,7	-	1			
		1	Pipe to blow off line <i>Personal protection only in the areas of cable ways and platforms.</i>	01 LCL 02 BR 001	"	180	168,3		60	0,7	-	1			
		2	Bend approx. 90° <i>Personal protection only in the areas of cable ways and platforms.</i>	01 LCL 02 BR 001	"	180	168,3		60	0,7	-	1			
		1	Drain pipe to 01LCL01BR002 <i>Personal protection only in the areas of cable ways and platforms and approx. 3m before drain lance.</i>	01 LCL 02 BR 201	"	180	33,7		30	0,5	-	1			
		1	connection to blow off line at level approx. +16.300m	-	"	-	-		-	-	-	-			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	11.3		Condensate to flash tank		257-0042										
		1	Pipe 1 from CBD to Flash Tank <i>Personal protection only in the areas of cable ways and platforms.</i>	01 LCL 02 BR 003	"	215	60,3		40	0,6	-	1			
		2	Bend approx. 90° <i>Personal protection only in the areas of cable ways and platforms.</i>	01 LCL 02 BR 003	"	215	60,3		40	0,6	-	1			

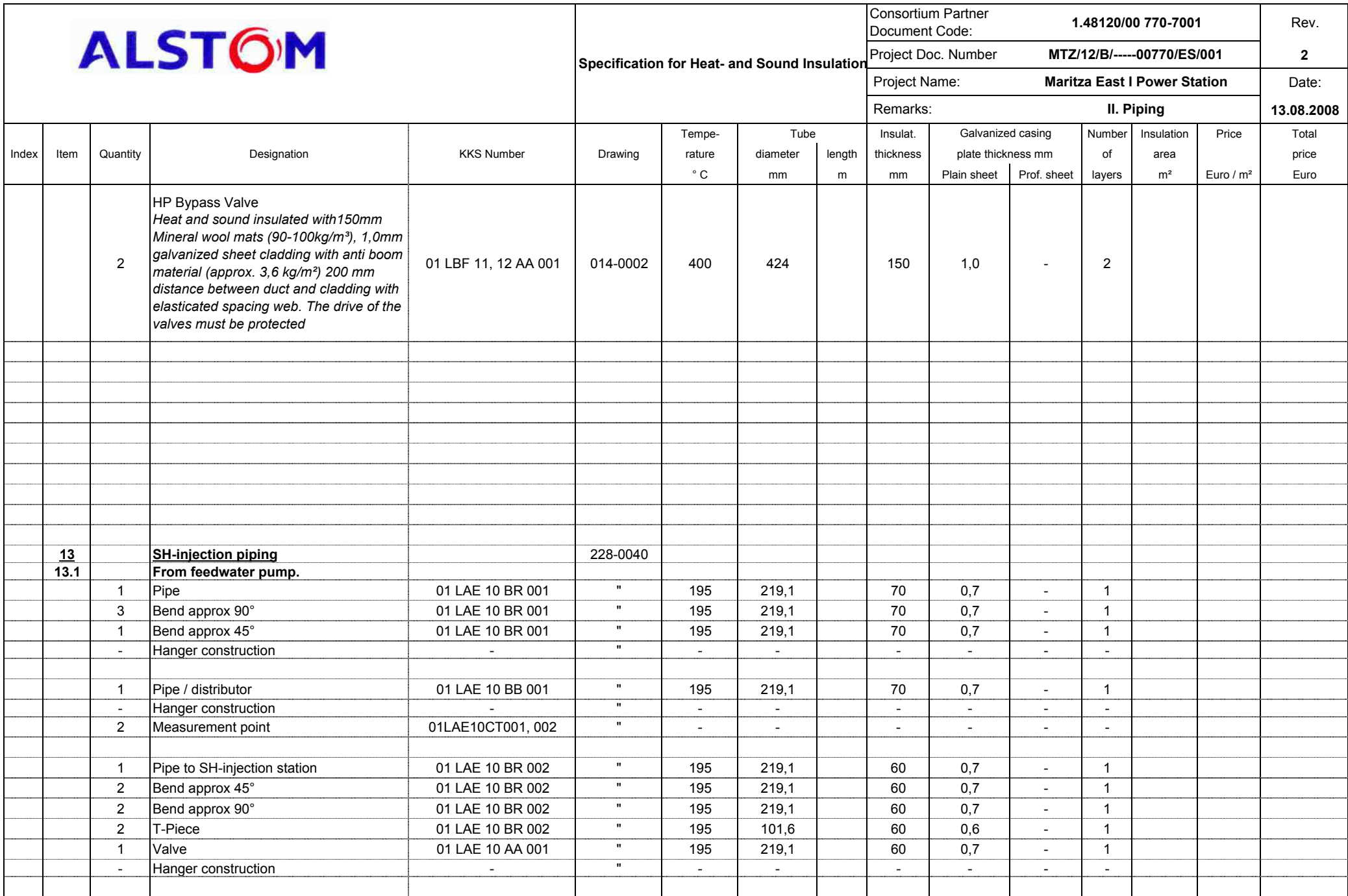
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		2	Valve <i>Personal protection only in the areas of cable ways and platforms.</i>	01 LCL 02 AA 004, 005	"	215	60,3		40	0,6	-	1			
		1	Pipe 2 from CBD to Flash Tank <i>Personal protection only in the areas of cable ways and platforms, and approx 3m before flash tank</i>	01 LCL 02 BR 004	"	180	88,9		40	0,6	-	1			
		2	Bend approx. 90° <i>Personal protection only in the areas of cable ways and platforms, and approx 3m before flash tank</i>	01 LCL 02 BR 004	"	180	88,9		40	0,6	-	1			
		1	connection to flash tank	-	"	-	-		-	-	-	-			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	11.4		Pipe to feedwater Tank		014-0004										
		1	connection to CBD blow off pipe	-		-	-		-	-	-	-			
		1	Pipe to feedwater tank <i>Personal protection only in the areas of cable ways and platforms.</i>	01 LCL 02 BR 002		215	76,1		50	0,6	-	1			
		-	Pipe bend <i>Personal protection only in the areas of cable ways and platforms.</i>	01 LCL 02 BR 002		215	76,1		50	0,6	-	1			
		2	Valve <i>Personal protection only in the areas of cable ways and platforms.</i>	01 LCL 02 AA 002, 003		215	76,1		50	0,6	-	1			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	12		Safety valves and HP bypass valve												
	12.1		Drum Safety Valve		257-0040										
		1	Drum safety valve <i>Heat and sound insulated with 100mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 150 mm distance between valve and cladding with elasticated spacing web. The drive of the valves must be protected</i>	01 HAD 01 AA 201	"	250	219,1		100	1,0	-	1			

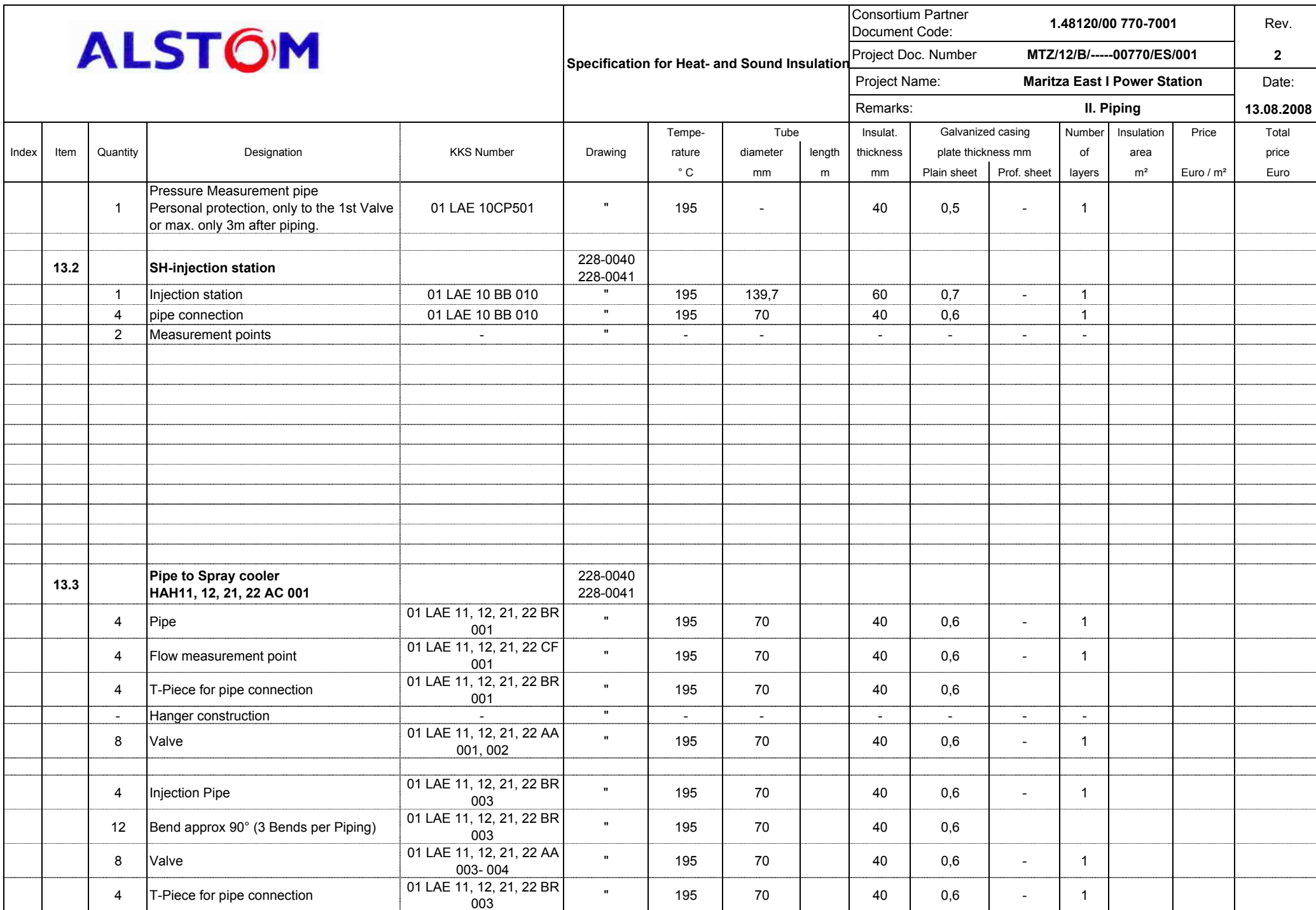
Consortium Partner	1.48120/00 770-7001	Rev.
Document Code:		
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	II. Piping	13.08.2008

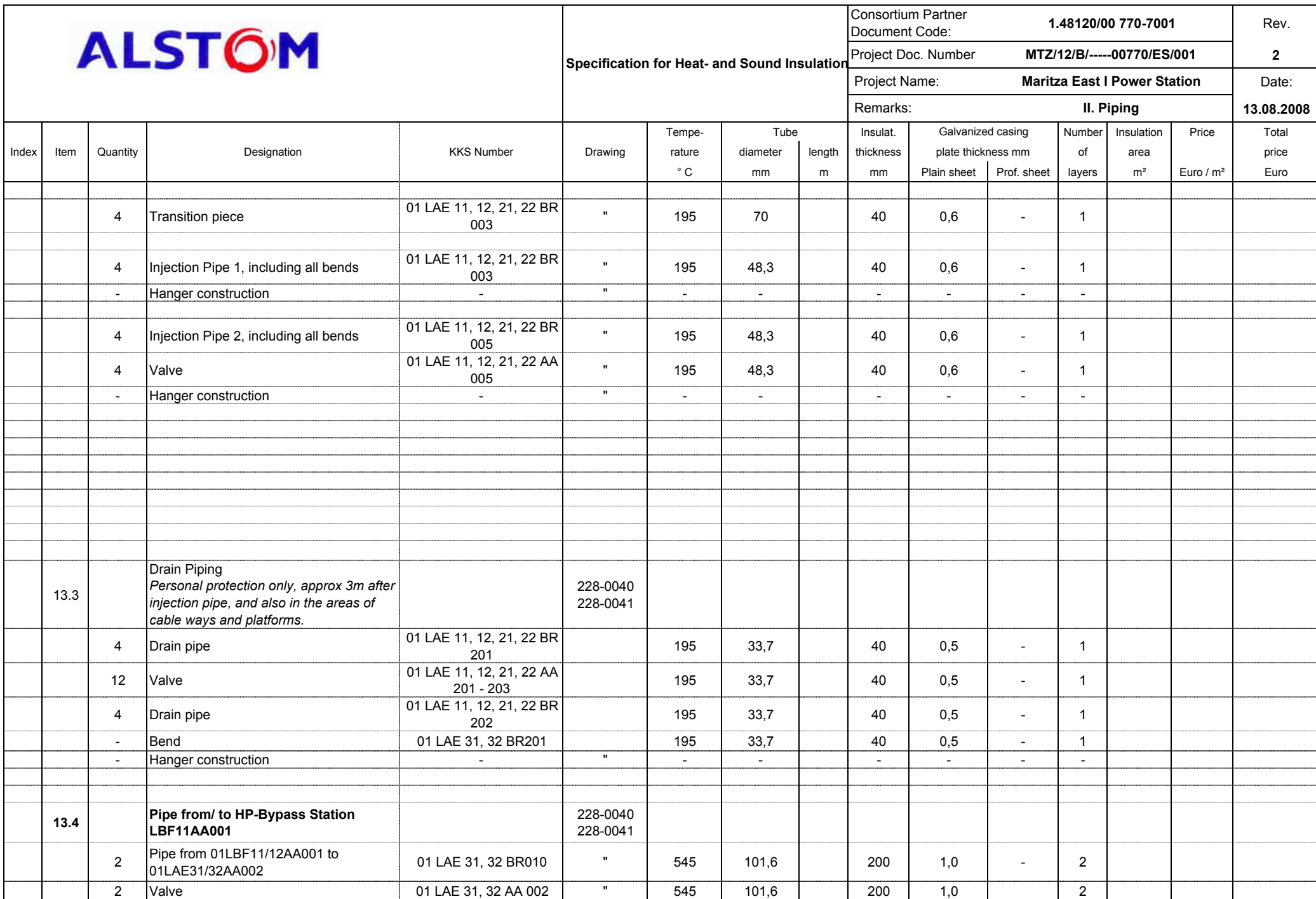
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	Blow off pipe vertical piece after insulation box for drum to roof penetration <i>Heat and sound insulated with 100mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 150 mm distance between pipe and cladding with elasticated spacing web.</i>	01 HAD 01 BR 202	"	250	219,1		100	1,0	-	1			
		1	Rain fender and penetration through boiler house roof	-	"	-	-		-	-	-	-			
		-	Hanger construction <i>pay attention on sound insulation</i>	-	"	-	-		-	-	-	-			
	12.1	1	Blow off pipe outside boiler house <i>Heat and sound insulated with 100mm Mineral wool mats (90-100kg/m³), 1.2mm aluminium sheet cladding with anti boom material (approx. 3,6 kg/m²) 150 mm distance between pipe and cladding with elasticated spacing web.</i>	-	257-0040	250	219,1		100	Al 1,2	-	1			
		1	Silencer <i>Heat and sound insulated with 100mm Mineral wool mats (90-100kg/m³), 1.2mm aluminium sheet cladding with anti boom material (approx. 3,6 kg/m²) 150 mm distance between valve and cladding with elasticated spacing web.</i>	01 HAD 01 BS 201	"	250	-		100	Al 1,2	-	1			
	12.2		RH Safety Valve		257-0041										
		2	RH Safety Valve at level approx. +75.100m <i>Heat and sound insulated with 150mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 200 mm distance between valve and cladding with elasticated spacing web. The drive of the valves must be protected</i>	01 LBB 11, 12 AA 201	257-0041	400	559		150	1,0	-	2			

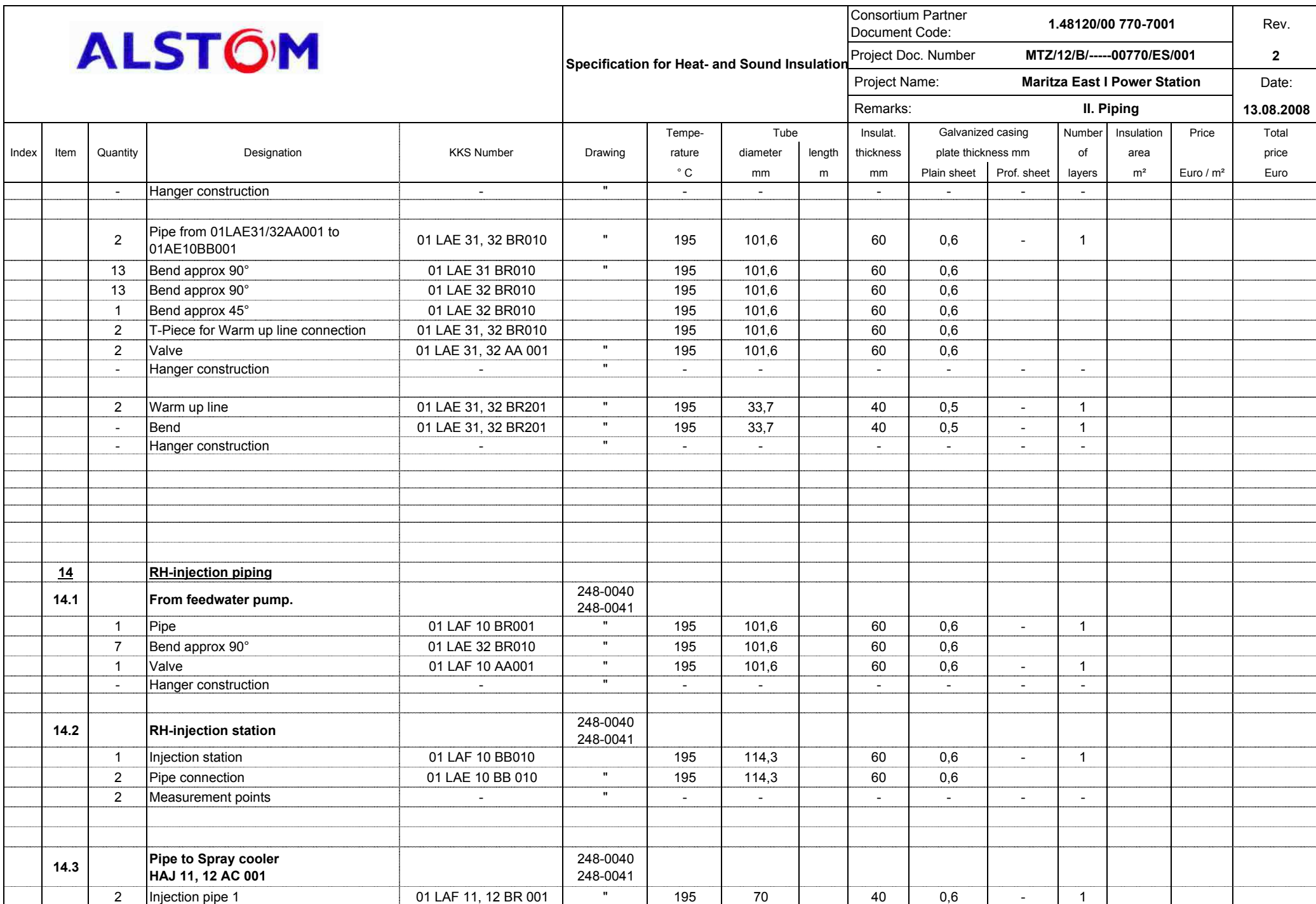
Consortium Partner	1.48120/00 770-7001	Rev.
Document Code:		
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	II. Piping	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		2	Spray head part <i>Heat and sound insulated with 150mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 200 mm distance between pipe and cladding with elasticated spacing web.</i>	01 LBB 11, 12 BB 201	"	400	1050		150	1,0	-	2			
		2	Vertical Blow off pipe to Silencer from level approx. +75.100m to roof penetration <i>Heat and sound insulated with 150mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 200 mm distance between pipe and cladding with elasticated spacing web.</i>	01 LBB 11, 12 BR 203	"	400	680		150	1,0	-	2			
	12.2	2	Rain fender with penetration through boiler house roof	-	257-0041	-	-		-	-	-	-			
		2	Vertical Blow off pipe to Silencer from roof penetration to silencer <i>Heat and sound insulated with 150mm Mineral wool mats (90-100kg/m³), 1.2mm aluminium sheet cladding with anti boom material (approx. 3,6 kg/m²) 200 mm distance between pipe and cladding with elasticated spacing web.</i>	01 LBB 11, 12 BR 203	"	400	680		150	AL 1,2	-	2			
		-	Hanger construction <i>(pay attention on sound insulation)</i>	-	"	-	-		-	-	-	-			
		2	Silencer at level approx. +94.000m <i>Heat and sound insulated with 100mm Mineral wool mats (90-100kg/m³), 1.2mm aluminium sheet cladding with anti boom material (approx. 3,6 kg/m²) 150 mm distance between silencer and cladding with elasticated spacing web.</i>	01 LBB 11, 12 BS 201	257-0041	400	-		100	AL 1,2	-	2			
	12.3		HP Bypass Valve												









Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	II. Piping	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		8	Bend approx 90°	01 LAF 11, 12 BR 001	"	195	70		40	0,6	-	1			
		2	T-Peaces for drain connection	01 LAF 11, 12 BR 001	"	195	70		40	0,6	-	1			
		2	Flow measurement	01 LAF 11, 12 CF 001	"	195	70		40	0,6	-	1			
		4	Valve	01 LAF 11, 12 AA 001, 002	"	195	70		40	0,6	-	1			
		2	Strainer	01 LAF 11, 12 AT 001	"	195	70		40	0,6	-	1			
		2	Pipe connection	01 LAF 11, 12 BR 001	"	195	70		40	0,6	-	1			
		-	Hanger construction	-	"	-	-		-	-	-	-			
		2	Pipe to Valve LAF11, 12 AA203	01 LAF 11, 12 AA 203	"	195	33,7		40	0,5	-	1			
		2	Bend approx 90°	01 LAF 11, 12 AA 203	"	195	33,7		40	0,5	-	1			
		2	Valve	01 LAF 11, 12 AA 203	"	195	33,7		40	0,5	-	1			
		2	Pipe downstream Valve LAF11, 12 AA203 Personal protection only, approx 3m after valve, and also in the areas of cable ways and platforms.	01 LAF 11, 12 AA 204	"	195	33,7		40	0,5	-	1			
		-	Hanger construction	-	"	-	-		-	-	-	-			
	14.3	2	Injection pipe 2	01 LAF 11, 12 BR 001	248-0040 248-0041	195	70		40	0,6	-	1			
		27	Bend approx 90°	01 LAF 11, 12 BR 001	"	195	70		40	0,6	-	1			
		1	Bend approx 45°	01 LAF 11, 12 BR 001	"	195	70		40	0,6	-	1			
		2	Bend approx 15°	01 LAF 11, 12 BR 001	"	195	70		40	0,6	-	1			
		-	Hanger construction	-	"	-	-		-	-	-	-			
		2	Injection valve	01 LAF 11, 12 AA 004		195	70		40	0,6	-	1			
			Drain Piping Personal protection only, approx 3m after injection pipe, and also in the areas of cable ways and platforms.												
		2	Drain pipe	01 LAF 11, 12, BR 201		195	33,7		40	0,5	-	1			
		4	Valve	01 LAF 11, 12, AA 201, 202		195	33,7		40	0,5	-	1			
		-	Bend	01 LAE 31, 32 BR201		195	33,7		40	0,5	-	1			
		-	Hanger construction	-	"	-	-		-	-	-	-			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	15		Drain piping		254-0041 to 254-0048										
	15.1		Filling line												
			<i>Personal protection only, approx 3m after T-peace, and approx. 3m before collector 01LCL01BR001 and also in the areas of cable ways and platforms.</i>												
		1	Pipe (filing line)	01 LAE 10 BR 201	"	336	76,1		120	0,7	-	1			
		2	Valve	01 LAE 10 AA 201, 202	"	336	76,1		120	0,7	-	1			
1	15.2		From evaporator		254-0041 to 254-0048										
	15.2.1		Pipe from wall headers												
			<i>Personal protection only, approx 3m after header box, and approx. 3m before collector 01LCL01BR001 and also in the areas of cable ways and platforms.</i>												
		6	Drain pipe from header	01 HAD 10, 30 BR 201-	"	366	38		110	0,7	-	1			
		4	Drain pipe Eva.Inl.	01 HAD 10, 30 BR 203 01 HAD 20, 40 BR 201	"	366	76,1		120	0,7	-	1			
		8	Valve	01 HAD 10, 30 AA 201, 202 01 HAD 20, 40 AA 201, 202	"	366	76,1		120	0,7	-	1			
	15.2.2		Pipe from drum to CBD tank												

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
			<i>Personal protection only, approx 3m after drum insulation, and approx. 3m before CBD tank and also in the areas of cable ways and platforms.</i>												
		1	Pipe	01 LCQ 10 BR 001	"	366	76,1		120	0,7	-	1			
		2	Valve	01 LCQ 10 AA 001, 002	"	366	76,1		120	0,7	-	1			
	15.2.3		From drum safety valve												
			<i>Personal protection only, approx 3m after drum insulation, and approx. 3m before drain lance and also in the areas of cable ways and platforms.</i>												
		1	Pipe	01 HAD 01 BR 205	"	366	48,3		110	0,7	-	1			
	15.3		From ECO												
			<i>Personal protection only, approx 3m after header box, and approx. 3m before Flash tank drain lance and also in the areas of cable ways and platforms.</i>												
		1	Pipe from ECO 2 inl.	01 HAC 20 BR 201	"	366	101,6		130	0,7	-	2			
		1	Valve	01 HAC 20 AA 201	"	366	101,6		130	0,7	-	2			
		1	Valve	01 HAC 20 AA 202	"	366	101,6		130	0,7	-	2			
1	15.4		SH- drains		254-0041 to 254-0048										
	15.4.1		Pipe from SH1 outl.												
			<i>Personal protection only, approx 3m after header box, and also in the areas of cable ways and platforms.</i>												
		1	Connection to SH1 outl. header	-	"	-	-		-	-	-	-			
		1	Pipe	01 HAH 10 BR 201	"	450	76,1		160	1,0	-	2			
	15.4.2		Pipe from SH2 outl.												
			<i>Personal protection only, approx 3m after header box, and also in the areas of cable ways and platforms.</i>												
		1	Connection to SH2 outl. header	-	"	-	-		-	-	-	-			
		1	Drain pipe part 1	01 HAH 20 BR 201	"	555	88,9		210	1,0	-	2			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	Drain pipe part 2	01 HAH 20 BR 201	"	450	88,9		160	1,0	-	2			
		2	Valve	01 HAH 20 AA 201, 202	"	450	88,9		160	1,0	-	2			
	15.4.3		Pipe from SH3 inl. <i>Personal protection only, approx 3m after T-piece connection BR202/BR201, and also in the areas of cable ways and platforms.</i>												
		1	Connection to SH3 inl. header	-	"	-	-		-	-	-	-			
		1	Rest drain SH2 / SH3	01 HAH 21, 22 BR 202	"	500	33,7		150	0,7	-	2			
		1	Drain pipe part 1	01 HAH 30 BR 201	"	500	76,1		180	1,0	-	2			
		1	Drain pipe part 2	01 HAH 30 BR 201	"	450	88,9		160	1,0	-	2			
		2	Valve	01 HAH 30 AA 201, 202	"	450	76,1		160	1,0	-	2			
1	15.4.4		SH-drain station		254-0041 to 254-0048										
			<i>Personal protection, approx only 3m before Flash Tank and in the areas of cable ways and platforms.</i>												
		1	Drain station	01 HAN 10 BB 001	"	450	168,3		190	1,0	-	2			
		1	Measuring point	-	"	-	-		-	-	-	-			
		1	Pressure Measurement pipe for HAN10CP002 <i>Personal protection, only to the 1st Valve or max. only 0,5m after piping.</i>	01 HAN 10 BR ...	"	450	-		30	0,5	-	1			
		2	Level Measurement pipe for HAN10CL001 <i>Personal protection, only to the 1st Valve or max. only 0,5m after main pipe</i>	01 HAN 10 BR ...	"	450	-		30	0,5	-	1			

Consortium Partner	1.48120/00 770-7001	Rev.
Document Code:		
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	II. Piping	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	Level Measurement pipe for HAN10CL002 Personal protection, only to the 1st Valve or max. only 0,5m after main pipe	01 HAN 10 BR ...	"	450	-		30	0,5	-	1			
		1	Pipe to flash tank 1	01 HAN 10 BR 001	"	450	168,3		190	1,0	-	2			
		1	Valve	01 HAN 10 AA 003	"	450	168,3		190	1,0	-	2			
		1	Pipe to flash tank, pipe from valve HAN10AA003 to HAN10AA004	01 HAN 10 BR 001	"	450	168,3		190	1,0	-	2			
		1	Bypass piping	01 HAN 10 BR 002	"	450	168,3		190	1,0	-	2			
		1	Valve	01 HAN 10 AA 001	"	450	168,3		190	1,0	-	2			
		1	Pipe to flash tank, pipe from valve HAN10AA001 to HAN10AA002	01 HAN 10 BR 001	"	450	168,3		190	1,0	-	2			
		2	Valve Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between valve and cladding with elasticated spacing web. The drives of the valves must be protected	01 HAN 10 AA 002, 003	"	180	168,3		70	1,0	-	1			
1	15.4.4	1	Pipe after valve HAN10AA002 Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between valve and cladding with elasticated spacing web.	-	254-0041 to 254-0048	180	168,3		70	1,0	-	1			
		1	Pipe to flash tank 2 Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between valve and cladding with elasticated spacing web.	01 HAN 10 BR 003	"	180	168,3		70	1,0	-	1			
	15.5		RH- drains												
	15.5.1		Pipe from RH-Safety valve.												

Consortium Partner	1.48120/00 770-7001	Rev.
Document Code:		
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	II. Piping	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		2	<i>Personal protection, approx only 3m after safety valve and approx. 3m before drain lance and also in the areas of cable ways and platforms.</i> Pipe	01 LBB 11, 12 BR206	"	400	48,3		120	0,7	-	1			
	<u>15.5.2</u>		<u>Pipe from RH1 outl.</u> <i>Personal protection only, approx 3m after header box, and also in the areas of cable ways and platforms.</i>												
		1	Pipe to flash tank	01 HAJ 10 BR201	"	521	114,3		200	1,0	-	2			
	<u>15.5.3</u>		<u>Pipe from RH2 inl.</u>												
		2	<i>Personal protection only, approx 3m after T-peace connection 01HAJ12BR202 / 01HAJ20BR201, and also in the areas of cable ways and platforms.</i> Rest Drain RH1/ 2	01 HAJ 11, 12 BR 202	"	480	33,7		140	0,7	-	2			
		1	Pipe to flash tank 1	01 HAJ 20 BR201	"	480	114,3		190	1,0	-	2			
		1	Valve	01 HAJ 20 AA201	"	480	114,3		190	1,0	-	2			
		1	Pipe to flash tank 2	01 HAJ 20 BR201	"	450	114,3		170	1,0	-	2			
1	<u>15.5.4</u>		<u>RH-drain station</u> <i>Personal protection, approx only 3m before Flash Tank and in the areas of cable ways and platforms.</i>		254-0041 to 254-0048										
		1	Drain station	01 HAN 20 BB 001	"	450	168,3		190	1,0	-	2			
		1	Measuring point	-	"	-	-		-	-	-	-			
		1	Pressure Measurement pipe for HAN20CP002 <i>Personal protection, only to the 1st Valve or max. only 0,5m after piping.</i>	01 HAN 20 BR ...	"	450	-		30	0,5	-	1			

Consortium Partner Document Code:		1.48120/00 770-7001	Rev. 2
Project Doc. Number		MTZ/12/B/-----00770/ES/001	
Project Name:		Maritza East I Power Station	Date: 13.08.2008
Remarks:		II. Piping	

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		2	Level Measurement pipe for HAN20CL001 Personal protection, only to the 1st Valve or max. only 0,5m after main pipe.	01 HAN 20 BR ...	"	450	-		30	0,5	-	1			
		2	Level Measurement pipe for HAN20CL002 Personal protection, only to the 1st Valve or max. only 0,5m after main pipe.	01 HAN 20 BR ...	"	450	-		30	0,5	-	1			
		1	Pipe to Flash Tank 1	01 HAN 20 BR 001	"	450	168,3		190	1,0	-	2			
		1	Valve	01 HAN 20 AA 003	"	450	168,3		190	1,0	-	2			
		1	Pipe to Flash Tank, pipe from valve HAN20AA003 to HAN20AA004	01 HAN 20 BR 001	"	450	168,3		190	1,0	-	2			
		1	Bypass piping	01 HAN 20 BR 002	"	450	168,3		190	1,0	-	2			
		1	Valve	01 HAN 20 AA 001	"	450	168,3		190	1,0	-	2			
		1	Bypass piping from valve HAN20AA001 to HAN20AA002	01 HAN 20 BR 002	"	450	168,3		190	1,0	-	2			
		2	Valve <i>Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between valve and cladding with elasticated spacing web. The drives of the valves must bean protected.</i>	01 HAN 20 AA 002, 004	"	180	168,3		70	1,0	-	1			
1	15.5.4	1	Pipe after valve HAN20AA002 <i>Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between valve and cladding with elasticated spacing web.</i>	01 HAN 20 BR 003	254-0041 to 254-0048	180	168,3		70	1,0	-	1			
		1	Pipe to flash tank 2 <i>Heat and sound insulated with 70mm Mineral wool mats (90-100kg/m³), 1.0mm galvanized sheet cladding with anti boom material (approx. 3,6 kg/m²) 100 mm distance between valve and cladding with elasticated spacing web.</i>	01 HAN 20 BR 003	"	180	168,3		70	1,0	-	1			

<div>ALSTOM</div>					Specification for Heat- and Sound Insulation				Consortium Partner					Rev.
									Document Code: 1.48120/00 770-7001					
									Project Doc. Number MTZ/12/B/-----00770/ES/001					
									Project Name: Maritza East I Power Station					
					Remarks: II. Piping					Date: 13.08.2008				
Index	Item	Quantity	Designation	KKS Number	Drawing	Tempe- rature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	15.6		Pipe from Sootblower <i>Personal protection, approx only 3m after sootblower piping and in the areas of cable ways and platforms.</i>											
		1	Pipe from air preheater sootblower	01 HCB 05 BR 201	"	480	88,9		180	1,0 -	2			
		1	Pipe from boiler sootblower	01 HCB 50 BR 201	"	480	88,9		180	1,0 -	2			
	16		Vent Piping		256-0040 256-0041 256-0042									
	16.1		Pipes from saturated steam lines <i>Personal protection only, approx 3m after insulation box for steam lines and in the areas of cable ways and platforms. No personal protection after the first valve necessary</i>											
		3	Pipe	01 HAD 01 BR 251 - 253	"	366	139,7		140	1,0 -	2			
	16.2		Pipes from SH2 inl. <i>Personal protection only, approx 3m after header box and in the areas of cable ways and platforms. No personal protection after the first valve necessary</i>											
		1	Pipe	01 HAH 20 BR 251	"	415	48,3		130	0,7 -	2			
1	16.3		Pipes from SH3 outl.		256-0040 256-0041 256-0042									
		1	Pipe	01 HAH 30 BR 251	"	545	42,4		180	1,0 -	2			
	16.4		Pipes from RH1 inl.											



Specification for Heat- and Sound Insulation

Consortium Partner	1.48120/00 770-7001	Rev.
Document Code:		2
Project Doc. Number	MTZ/12/B/-----00770/ES/001	Date:
Project Name:	Maritza East I Power Station	13.08.2008
Remarks:	II. Piping	

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
			<i>Personal protection only, approx 3m after header box and in the areas of cable ways and platforms. No personal protection after the first valve necessary</i>												
		1	Pipe	01 HAJ 10 BR 251	"	381	76,1		130	0,7	-	2			
	16.5		Pipes from RH2 outl.		???										
			<i>Personal protection only, approx 3m after header box and in the areas of cable ways and platforms. No personal protection after the first valve necessary</i>												
		1	Pipe	01 HAJ 20 BR 251	"	546	60,3		190	1,0	-	2			
	17		Condensate storage tank												
	17.1		Condensate storage tank		291-0040 291-0070 014-7501										
		1	Condensate storage tank	01 LCL 10 BB 001	"	144	-		40	1,0	-	1			
		1	Cap for inspection door	-	"	144	-		40	1,0	-	1			
		-	Measuring points	-	"	-	-		-	-	-	-			
	17.2		Condensate piping		291-0040 014-7501										
		1	Pipe from Flash tank	-	"	180	approx. 300		60	1,0	-	1			
		1	Cap for expansion joint		"	180	approx. 300		60	1,0	-	1			
		1	Reheat Evaporating Pipe (pipe from Condensate tank to Flash tank blow of line)	01 LCL 10 BR 002	"	144	approx. 115		30	0,6	-	1			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	17.3		Piping to condensate pumps		291-0040 014-7501										
		2	Pipe to condensate pump	01 LCL 11, 21 BR 001	"	144	approx. 200		30	0,7	-	1			
		8	Bend approx. 90°	01 LCL 11, 21 BR 001	"	144	approx. 200		30	0,7	-	1			
		2	Bend approx. 45°	01 LCL 11, 21 BR 001	"	144	approx. 200		30	0,7	-	1			
		2	Valve	01 LCL 11, 21 AA 001	"	144	approx. 200		30	0,7	-	1			
		2	Pressure Measurement pipe for LCL11, 21 CP001 personal protection, only to the 1st Valve c max. only 0,5m after main pipe.	01 LCL 11, 21 CP 001	"	144	-		30	0,5	-	1			
		2	Condensate pump	01 LCL 11, 21 AP 001	"	144	-		30	0,7	-	1			
		2	Pipe from condensate pump	01 LCL 11, 21 BR 002	"	144	approx. 130		30	0,6	-	1			
		2	Pressure Measurement pipe for LCL11, 21 CP002 personal protection, only to the 1st Valve c max. only 0,5m after main pipe.	01 LCL 11, 21 CP 001	"	144	-		30	0,5	-	1			
		-	Bend	"	"	144	approx. 130		30	0,6	-	1			
		4	Valve	01 LCL 11, 21 AA 002, 003	"	144	approx. 130		30	0,6	-	1			
		2	Connection for drain pipe	-	"	-	-		-	-	-	-			
		1	T- peace	01 LCL 11, 21 BR 002	"	144	approx. 130		30	0,6	-	1			
		1	Pipe to main cooling water return	01 LCL 30 BR 001	"	144	approx. 130		30	0,6	-	1			
		-	Bend	"	"	144	approx. 130		30	0,6	-	1			
		1	Connection for pipe to Condensate Storage tank	-	"	-	-		-	-	-	-			
	17.3	1	Pressure Measurement pipe for LCL30CP001 personal protection, only to the 1st Valve c max. only 0,5m after piping.	01 LCL 30 CP 001	291-0040 014-7501	144	-		30	0,5	-	1			
		2	Valve	01 LCL 30 AA 101, 102	"	144	approx. 130		30	0,6	-	1			
		1	Pipe to condensate storage tank	01 LCL 30 BR 002	"	144	approx. 60		30	0,5	-	1			
		-	Bend	"	"	144	approx. 60		30	0,5	-	1			
		1	Valve	01 LCL 30 AA 001	"	144	approx. 60		30	0,5	-	1			
	18		Measuring piping for drum												

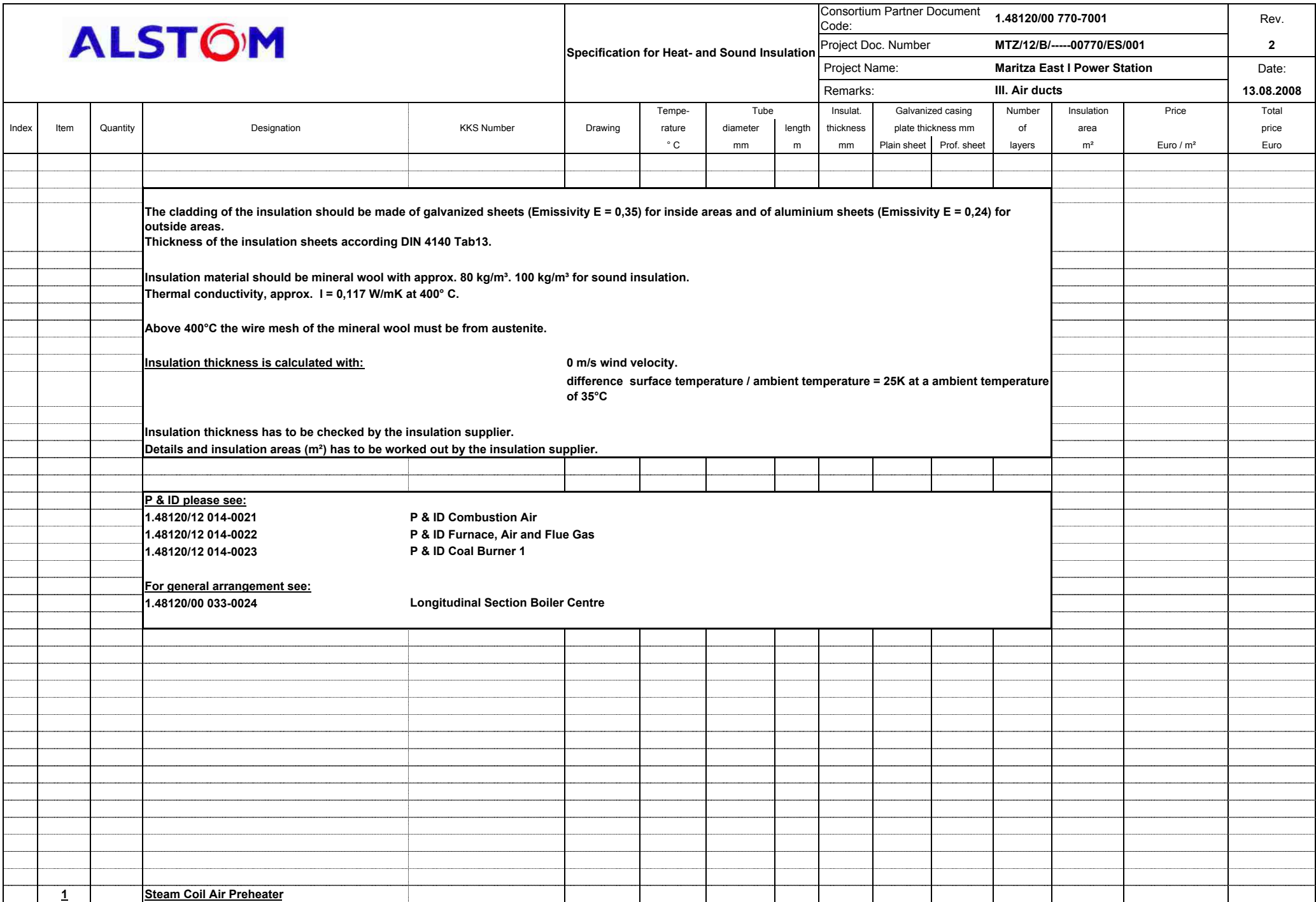


Specification for Heat- and Sound Insulation

Consortium Partner Document Code:	1.48120/00 770-7001	Rev. 2
Project Doc. Number	MTZ/12/B/-----00770/ES/001	Date: 13.08.2008
Project Name:	Maritza East I Power Station	
Remarks:	II. Piping	

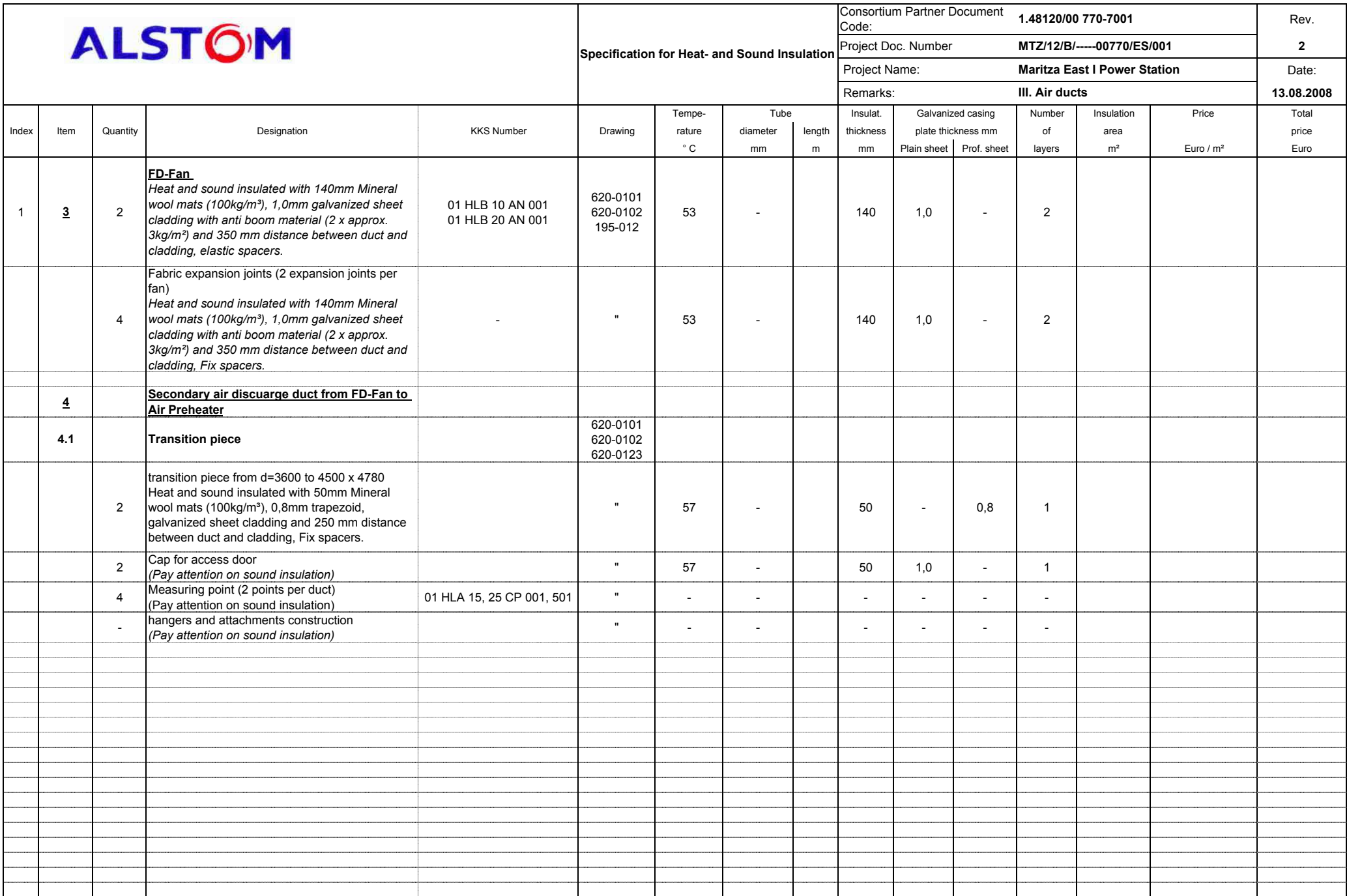
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		4	Pressure Measurement pipe for HAD01CP001 - 004 Personal protection, only to the 1st Valve or max. only 0,5m after insulation box.	01 HAD 01 BR ...	-	360	-		30	0,5	-	1			
		10	Level Measurement pipe for HAD01CL001 - 005 Personal protection, only to the 1st Valve or max. only 0,5m after insulation box.	01 HAD 01 BR ...	-	360	-		30	0,5	-	1			
2	19		Auxiliary boiler	See VIII Aux. Boiler											
	19.1	-	Feedwater from Auxiliary boiler Pipe						approx. 100	1,0	-	4			
	19.2	2	Auxiliary boiler Auxiliary boiler						approx. 100	1,0	-	4			
	19.3	-	Feedwater tank Feedwater tank						approx. 100	1,0	-	4			
	19.4	-	Piping Pipe						approx. 100	1,0	-	4			
II. Piping, total:															

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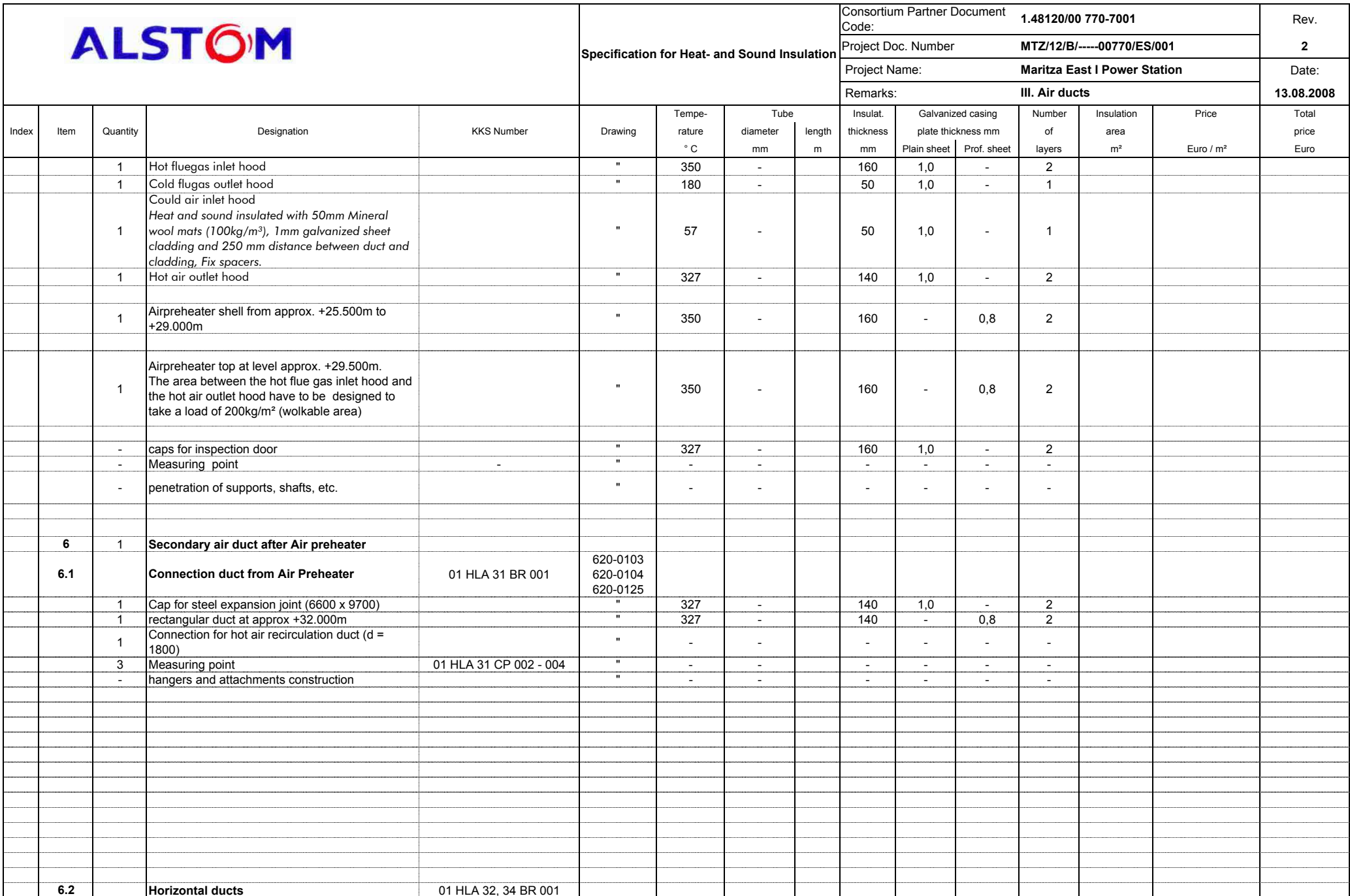


Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	III. Air ducts	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		2	(approx. 5.000 x 7.300), at level approx +26.500m	01 HLC 10 01 HLC 20	620-0102 620-0124	25	-		30	-	0,8	1			
	2	2	Secondary cold air suction duct from SCAPH to FD-Fan												
	2.1		Air duct from SCAPH to Silencer		620-0102 620-0124										
		2	Transition piece from 5.000 x 7.300 to 5.000 x 4.200		"	25	-		30	-	0,8	1			
		2	steel expansion joints		"	25	-		30	-	0,8	1			
		2	Vertical duct to approx +17.000m (5.000 x 4.200)		"	25	-		30	-	0,8	1			
		4	Cap for acces door (2 doors per duct)		"	25	-		30	1,0	-	1			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	2.2	2	Silencer <i>Heat and sound insulated with 50mm Mineral wool mats (100kg/m³), 0,8mm trapezoid, galvanized sheet cladding and 250 mm distance between duct and cladding, Fix spacers.</i>		620-0102 620-0124	25	-		50	-	0,8	1			
	2.3		Air duct from Silencer to FD-Fan		620-0102 620-0124										
		2	Rectangular duct (5.000 x 4.200) <i>Heat and sound insulated with 50mm Mineral wool mats (100kg/m³), 0,8mm trapezoid, galvanized sheet cladding and 250 mm distance between duct and cladding, Fix spacers.</i>		"	53	-		50	-	0,8	1			
		12	Measuring point (6 point per duct) (Pay attention on sound insulation)	01 HLA 14, 24 CP 001, 501 - 503, CT 001, 002	"	-	-		-	-	-	-			
		2	connection of hot air recirculation duct		"	327	-		-	-	-	-			
		-	hangers and attachments construction (Pay attention on sound insulation)		"	-	-		-	-	-	-			
		2	Transition piece from (5.000 x 4.200) to (2.650 x 4.770) <i>Heat and sound insulated with 50mm Mineral wool mats (100kg/m³), 0,8mm trapezoid, galvanized sheet cladding and 250 mm distance between duct and cladding, Fix spacers.</i>		"	53	-		50	-	0,8	1			



Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	4.2		Duct upwards		620-0101 620-0102 620-0123										
		2	duct 4500 x 4780 Heat and sound insulated with 50mm Mineral wool mats (100kg/m³), 0.8mm trapezoid, galvanized sheet cladding and 250 mm distance between duct and cladding, Fix spacers.		"	57	-		50	-	0,8	1			
		2	Insulation cap for damper Heat and sound insulated with 50mm Mineral wool mats (100kg/m³), 0.8mm trapezoid, galvanized sheet cladding and 250 mm distance between duct and cladding, Fix spacers.	01 HLA 15, 25 AA 001	"	57	-		50	-	0,8	1			
		8	Measuring point (4 points per duct) (Pay attention on sound insulation)	01 HLA 15, 25 CT 001, 002, CP 002, 502	"	-	-		-	-	-	-			
		-	hangers and attachments construction (Pay attention on sound insulation)		"	-	-		-	-	-	-			
	4.3		Air duct to Air Preheater		620-0101 620-0102 620-0123										
		1	duct 9419 x 4780 x 4500 Heat and sound insulated with 50mm Mineral wool mats (100kg/m³), 0.8mm trapezoid, galvanized sheet cladding and 250 mm distance between duct and cladding, Fix spacers.	01 HLA 30 BR 001	"	57	-		50	-	0,8	1			
		2	Ash hopper Heat and sound insulated with 50mm Mineral wool mats (100kg/m³), 0.8mm trapezoid, galvanized sheet cladding and 250 mm distance between duct and cladding, Fix spacers.		"	57	-								
		2	Measuring point (Pay attention on sound insulation)	01 HLA 30 CP 001, 501	"	-	-		-	-	-	-			
		1	Cap for access door (Pay attention on sound insulation)		"	57	-		50	-	0,8	1			
		-	hangers and attachments construction (Pay attention on sound insulation)		"	-	-		-	-	-	-			
		1	Fabric expansion joint Heat and sound insulated with 50mm Mineral wool mats (100kg/m³), 0.8mm trapezoid, galvanized sheet cladding and 250 mm distance between duct and cladding, Fix spacers.		"	57	-		50	-	0,8	1			
	5	1	Air Preheater		630-0102 602-0006										





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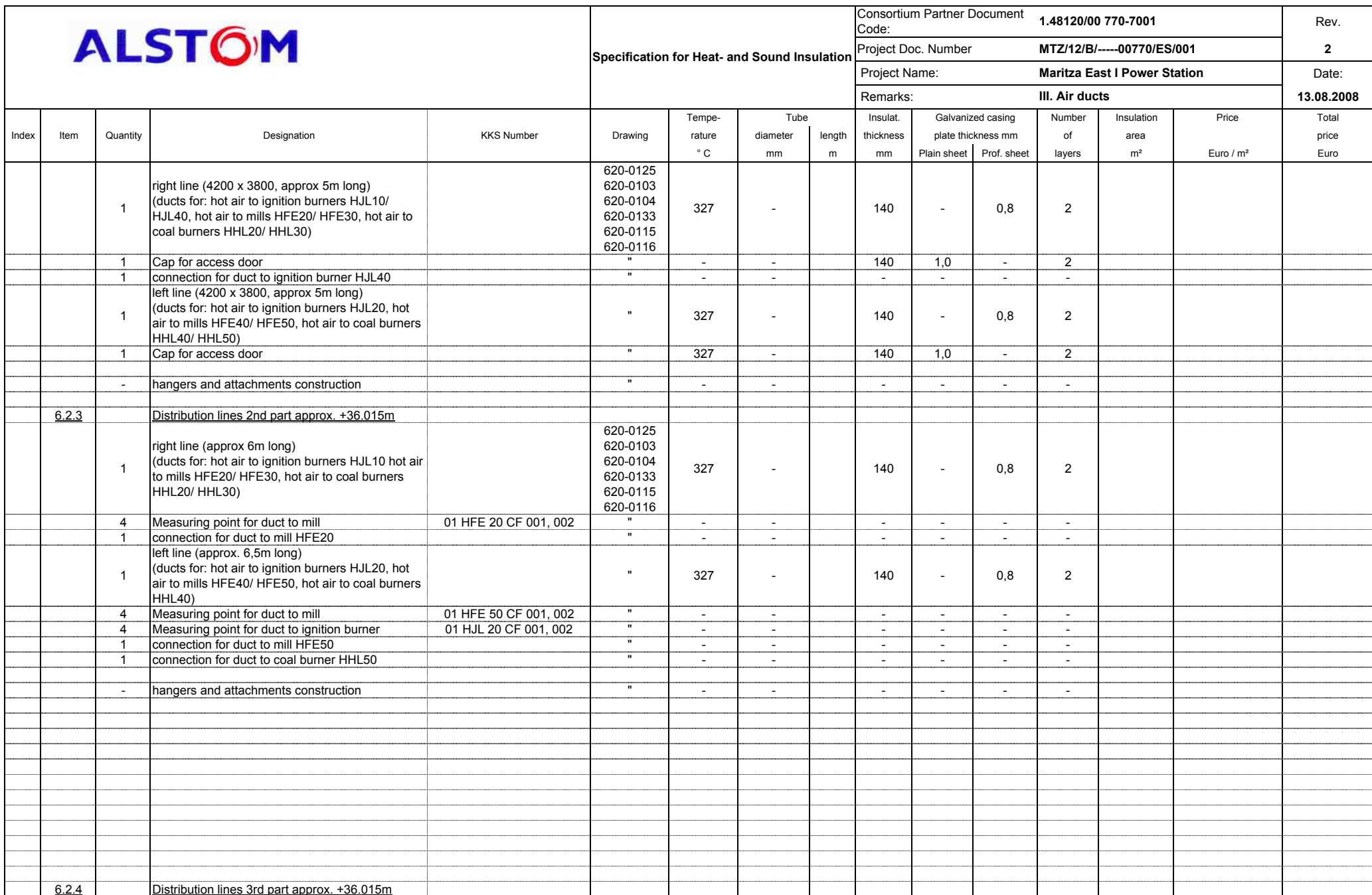
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Date:

13.08.2008

Page 6 of 141

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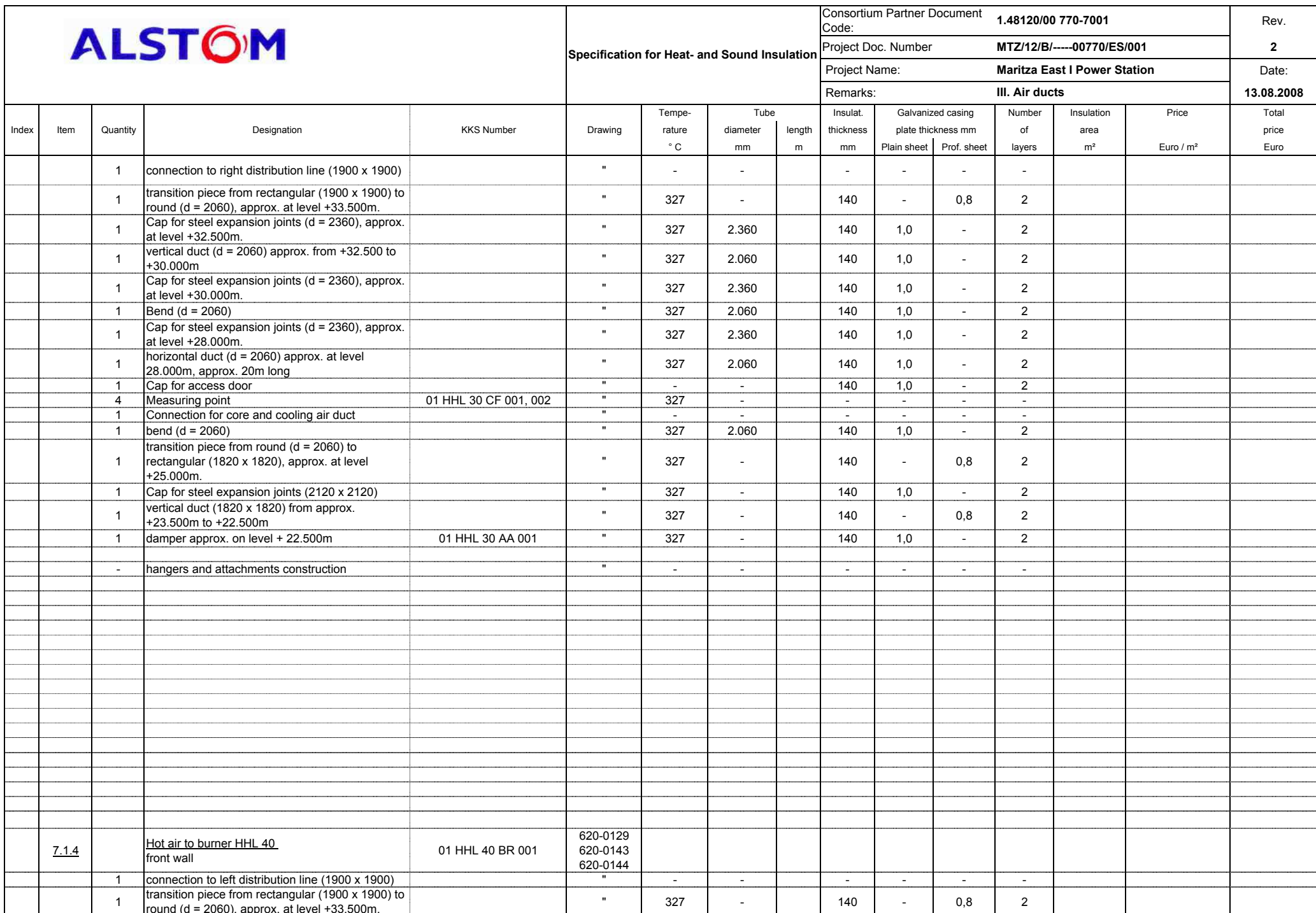


Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	III. Air ducts	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	right line (approx. 6m long) (ducts for: hot air to ignition burner HJL10 hot air to mill HFE30, hot air to coal burners HHL20/ HHL30)		"	327	-		140	-	0,8	2			
		1	Cap for access door for Hot air duct to Coal burner.		"	-	-		140	1,0	-	2			
		1	Cap for access door for Hot air duct to Ignition burner.		"	-	-		140	1,0	-	2			
		1	connection for duct to coal burner HHL20		"	-	-		-	-	-	-			
		1	left line (1900 x 4600 approx. 8m long) (ducts for: hot air to ignition burner HJL20, hot air to mill HFE40, hot air to coal burner HHL40)		"	327	-		140	-	0,8	2			
		1	Cap for access door for hot air duct to ignition burner		"	327	-		140	1,0	-	2			
		1	connection for duct to ignition burner HJL20		"	-	-		-	-	-	-			
		1	Cap for damper for hot air to ignition burner	01 HJL 20 AA 001	"	327	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	6.2.5		Distribution lines 4th part approx. +36.015m												
		1	right line (1900 x 4600 approx 7m long) (ducts for: hot air to ignition burner HJL10 hot air to mill HFE30, hot air to coal burner HHL30)		620-0125 620-0103 620-0104 620-0133 620-0115 620-0116	327	-		140	-	0,8	2			
		4	Measuring point for duct to mill	01 HFE 30 CF 001, 002	"	-	-		-	-	-	-			
		1	connection for duct to ignition burner HJL10		"	-	-		-	-	-	-			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	6.2.6		Distribution lines 5th part approx. +36.015m												
		1	right line (1900 x 3180 approx. 6m long) (ducts for: hot air to mill HFE30, hot air to coal burner HHL30)		620-0125 620-0103 620-0104	327	-		140	-	0,8	2			
		1	Cap for access door		"	-	-		140	1,0	-	2			
		1	connection for duct to mill HFE30		"	-	-		-	-	-	-			
		1	connection for duct to coal burner HHL30		"	-	-		-	-	-	-			
		1	left line (1900 x 3180 approx. 10,5m long) (ducts for: hot air to mill HFE40, hot air to coal burner HHL40)		"	327	-		140	-	0,8	2			
		4	Measuring point for duct to mill	01 HFE 40 CF 001, 002	"	-	-		-	-	-	-			
		1	Cap for access door		"	-	-		140	1,0	-	2			
		1	connection for duct to mill HFE40		"	-	-		-	-	-	-			
		1	connection for duct to coal burner HHL40		"	-	-		-	-	-	-			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	7		Air ducts to the coal burners												

Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	III. Air ducts	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	7.1		Hot air to burners ducts from approx. +34.000m to 23.000m												
	<u>7.1.1</u>		<u>Hot air to burner HHL 10</u> rear wall	01 HHL 10 BR 001	620-0129 620-0143 620-0144										
		1	connection to right distribution line (1820 x 1820)		"	-	-		-	-	-	-			
		1	vertical duct (1820 x 1820) from approx. +33.000m to +29.000m		"	327	-		140	-	0,8	2			
		2	Cap for meatal expansion joints (2120 x 2120) aprox. on level +31.500m and on +30.000		"	327	-		140	1,0	-	2			
		1	horizontal duct (1820 x 1820) on level +28.060m, approx. 19m long		"	327	-		140	-	0,8	2			
		1	Cap for access door		"	327	-		140	1,0	-	2			
		1	Cap for steel expansion joint (2120 x 2120)		"	327	-		140	1,0	-	2			
		4	Measuring point	01 HHL 10 CF 001, 002	"	-	-		-	-	-	-			
		1	Connection for duct for core and cooling air		"	-	-		-	-	-	-			
		1	vertical duct (1820 x 1820) from approx. +28.500m to +22.500m		"	327	-		140	-	0,8	2			
		1	Cap for steel expansion joint (2120 x 2120) aprox. on level +24.000m		"	327	-		140	1,0	-	2			
		1	Damper approx. on level + 22.500m	01 HHL 10 AA 001	"	327	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	<u>7.1.2</u>		<u>Hot air to burner HHL 20</u> right side wall	01 HHL 20 BR 001	620-0129 620-0143 620-0144										
		1	connection to right distribution line (1820 x 1820)		"	-	-		-	-	-	-			
		1	horizontal duct (1820 x 1820) approx. on level +35.500m, approx. 4m long		"	327	-		140	-	0,8	2			
		2	Cap for steel expansion joints		"	327	-		140	1,0	-	2			
		1	vertical duct (1820 x 1820) from approx. +34.500m to +22.500m		"	327	-		140	-	0,8	2			
		4	Measuring point	01 HHL 20 CF 001, 002	"	-	-		-	-	-	-			
		1	connection for core and cooling air		"	-	-		-	-	-	-			
		1	damper approx. on level + 22.500m	01 HHL 20 AA 001	"	327	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	<u>7.1.3</u>		<u>Hot air to burner HHL 30</u> front wall	01 HHL 30 BR 001	620-0129 620-0143 620-0144										



Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	III. Air ducts	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	Cap for steel expansion joints (d = 2360), approx. at level +32.500m.		"	327	2.360		140	1,0	-	2			
		1	vertical duct (d = 2060) approx. from +32.500 to +30.000m		"	327	2.060		140	1,0	-	2			
		1	Cap for steel expansion joints (d = 2360), approx. at level +30.000m.		"	327	2.360		140	1,0	-	2			
		1	bend (d = 2060)		"	327	2.060		140	1,0	-	2			
		1	Cap for steel expansion joints (d = 2360), approx. at level +28.000m.		"	327	2.360		140	1,0	-	2			
		1	horizontal duct (d = 2060) approx. at level 28.000m, approx. 20m long		"	327	2.060		140	1,0	-	2			
		1	Cap for access door		"	327	-		140	1,0	-	2			
		4	Measuring point	01 HHL 40 CF 001, 002	"	-	-		-	-	-	-			
		1	Connection for core and cooling air duct		"	-	-		-	-	-	-			
		1	bend (d = 2060)		"	327	2.060		140	1,0	-	2			
		1	transition piece from round (d = 2060) to rectangular (1820 x 1820), approx. at level +25.000m.		"	327	-		140	-	0,8	2			
		1	Cap for steel expansion joints (2120 x 2120)		"	327	-		140	1,0	-	2			
		1	vertical duct (1820 x 1820) from approx. +23.500m to +22.500m		"	327	-		140	-	0,8	2			
		1	damper approx. on level + 22.500m	01 HHL 40 AA 001	"	327	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	7.1.5		Hot air to burner HHL 50 left side wall	01 HHL 50 BR 001	620-0129 620-0143 620-0144										
		1	connection to right distribution line (1820 x 1820)		"	-	-		-	-	-	-			
		1	horizontal duct (1820 x 1820) approx. on level +35.500m, approx. 4m long		"	327	-		140	-	0,8	2			
		2	Cap for meatal expansion joints		"	327	-		140	1,0	-	2			
		1	vertical duct (1820 x 1820) from approx. +34.500m to +22.500m		"	327	-		140	-	0,8	2			
		4	Measuring point	01 HHL 50 CF 001, 002	"	-	-		-	-	-	-			
		1	connection for core and cooling air		"	-	-		-	-	-	-			
		1	damper approx. on level + 22.500m	01 HHL 50 AA 001	"	327	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	7.1.6		Hot air to burner HHL 60 rear wall	01 HHL 60 BR 001	620-0129 620-0143 620-0144										
		1	connection to left distribution line (1820 x 1820)		"	-	-		-	-	-	-			
		1	vertical duct (1820 x 1820) from approx. +33.000m to +29.000m		"	327	-		140	-	0,8	2			
		2	Cap for steel expansion joints (2120 x 2120) aprox. on level +31.500m and on +30.000		"	327	-		140	1,0	-	2			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	horizontal duct (1820 x 1820) on level +28.060m, approx. 19m long		"	327	-		140	-	0,8	2			
		1	Cap for access door		"	327	-		140	1,0	-	2			
		1	Cap for steel expansion joint (2120 x 2120)		"	327	-		140	1,0	-	2			
		4	Measuring point	01 HHL 60 CF 001, 002	"	-	-		-	-	-	-			
		1	Connection for core and cooling air duct		"	-	-		-	-	-	-			
		1	vertical duct (1820 x 1820) from approx. +28.500m to +22.500m		"	327	-		140	-	0,8	2			
		1	Cap for steel expansion joint (2120 x 2120) aprox. on level +24.000m		"	327	-		140	1,0	-	2			
		1	damper approx. on level + 22.500m	01 HHL 60 AA 001	"	327	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
1	7.2		Branch ducts to burners		620-0105 620-0106 620-0128										
		6	vertical duct from approx. +22.500m to +14.000m (the cross-sectional area of the duct is decreasing from 1820 x 1820 to 1820 x 600)		"	327	-		140	-	0,8	2			
		6	Measuring point	01 HHL 10 - 60 CP 501	"	-	-		-	-	-	-			
		6	Cap for Access door (one door per duct)		"	327	-		140	1,0	-	2			
		18	Branch duct to coal burner (approx 850 x 1450) (3 per duct)		"	327	-		140	1,0	-	2			
		36	Cap for steel expansion joints (2 joints per branch duct)		"	327	-		140	1,0	-	2			
		36	dampers (2 dampers per finger)	01 HHL 10 - 60 AA 002, 003, 005, 006, 008, 009	"	327	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
1	7.3		Core and cooling air to main burners		620-0107 620-0108 620-0135										
	7.3.1		core and cooling air to burner HHL 10 rear wall												
			main duct												
		1	connection to air duct		"	-	-		-	-	-	-			
		1	horizontal duct (d = 930), approx. 4,5m long, +24,110m		"	327	930		140	1,0	-	2			
		2	Cap for steel expansion joint (round)		"	327	930		140	1,0	-	2			
		1	bend approx. 45° (d = 930)		"	327	930		140	1,0	-	2			

Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	III. Air ducts	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	bend 90° (d = 930)		"	327	930		140	1,0	-	2			
		1	vertical duct (d = 930) from level approx. +27.900m to +23.300m		"	327	930		140	1,0	-	2			
		1	branch (d = 406) for duct to burner, at level approx. +25.800m		"	-	-		-	-	-	-			
		1	transition piece from (d = 930) to (d = 790) at level approx. +23.000m		"	327	930		140	1,0	-	2			
		1	vertical duct (d = 790) from level approx. +22.500m to +20.000m		"	327	790		140	1,0	-	2			
		1	branch (d = 406) for duct to burner, at level approx. +20.903m		"	-	-		-	-	-	-			
		1	transition piece from (d = 790) to (d = 690) at level approx. +20.000m		"	327	790		140	1,0	-	2			
		1	vertical duct (d = 690) from level approx. +20.000m to +17.000m		"	327	690		140	1,0	-	2			
		1	branch (d = 508) for duct to burner, at level approx. +17.988m		"	-	-		-	-	-	-			
		1	transition piece from (d = 690) to (d = 508) at level approx. +17.000m		"	327	690		140	1,0	-	2			
		1	vertical duct (d = 508) from level approx. +17.000m to +15.328m		"	327	508		140	1,0	-	2			
		1	bend approx. 90° (d = 508)		"	327	508		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
			<u>duct to burner</u>												
		2	connection to main duct at level approx. +25.800m, +20.900m		"	-	-		-	-	-	-			
		2	horizontal duct (d = 406), at level approx +25.800, +20.900m, each approx. 3m long		"	327	508		140	1,0	-	2			
		4	Cap for steel expansion joints (round), 2 expansion joints per duct		"	327	508		140	1,0	-	2			
		1	bend approx. 45° (d = 406)		"	327	508		140	1,0	-	2			
		1	bend approx. 90° (d = 406)		"	327	508		140	1,0	-	2			
1	7.3.1	1	damper (round)	01 HHL 10 AA 010	620-0107 620-0108 620-0135	327	508		140	1,0	-	2			
		1	transition piece from round (d = 406) to rectangular		"	327	-		140	1,0	-	2			
		1	connection to main duct at level approx. +17,988m		"	-	-		-	-	-	-			
		2	horizontal duct (d = 508), at level approx. +17.988m and 15,328m, approx. 3m long		"	327	406		140	1,0	-	2			
		2	Cap for steel expansion joints (round)		"	327	406		140	1,0	-	2			
		2	damper (round)	01 HHL 10 AA 004, 007											
		2	bend approx. 45° (d = 508)		"	327	406		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	<u>7.3.2</u>		core and cooling air to burner HHL 20 right side wall		620-0107 620-0108 620-0135										
			<u>main duct</u>		"										
		1	connection to air duct		"	-	-		-	-	-	-			
		1	horizontal duct (d = 930), approx. 7m long, +24.110 m		"	327	930		140	1,0	-	2			
		1	bend approx. 90° (d = 930)		"	327	930		140	1,0	-	2			
		2	Cap for steel expansion joint (round)		"	327	930		140	1,0	-	2			
		1	bend 90° (d = 930)		"	327	930		140	1,0	-	2			
		1	branch (d = 406) for duct to burner, at level approx. +25.800m		"	-	-		-	-	-	-			
		1	transition piece from (d = 930) to (d = 790) at level approx. +23.000m		"	327	930		140	1,0	-	2			
		1	vertical duct (d = 790) from level approx. +22.500m to +20.000m		"	327	790		140	1,0	-	2			
		1	branch (d = 406) for duct to burner, at level approx. +20.903m		"	-	-		-	-	-	-			
		1	transition piece from (d = 790) to (d = 690) at level approx. +20.000m		"	327	790		140	1,0	-	2			
		1	vertical duct (d = 690) from level approx. +19.500m to +17.000m		"	327	690		140	1,0	-	2			
		1	branch (d = 508) for duct to burner, at level approx. +17.988m		"	-	-		-	-	-	-			
		1	transition piece from (d = 690) to (d = 508) at level approx. +17.000m		"	327	690		140	1,0	-	2			
		1	vertical duct (d = 508) from level approx. +17.000m to +15.328m		"	327	508		140	1,0	-	2			
		1	bend approx. 90° (d = 508)		"	327	508		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	<u>7.3.2</u>		<u>duct to burner</u>		620-0107 620-0108 620-0135										
		2	connection to main duct at level approx. + 25.800m and +20.903m		"	-	-		-	-	-	-			
		2	duct (d = 406), at level approx. + 25.800m and +20.903m, each approx. 3m long		"	327	508		140	1,0	-	2			
		4	Cap for steel expansion joints (round), 2 expansion joints per duct		"	327	508		140	1,0	-	2			
		1	bend approx. 45° (d = 406)		"	327	508		140	1,0	-	2			
		2	bend approx. 90° (d = 406)		"	327	508		140	1,0	-	2			
		1	damper (round)	01 HHL 20 AA 010	"	327	508		140	1,0	-	2			
		1	transition piece from round (d = 406) to rectangular		"	327	-		140	1,0	-	2			

Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	III. Air ducts	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	connection to main duct at level approx. +17.988m		"	-	-		-	-	-	-			
		2	horizontal duct (d = 508), at level approx +17.988m and 15.328m, approx. 3m long		"	327	406		140	1,0	-	2			
		4	Cap for steel expansion joints (round)		"	327	406		140	1,0	-	2			
		2	damper	01 HHL 20 AA 004, 007											
		2	bend approx. 45° (d = 508)		"	327	406		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	7.3.3		core and cooling air to burner HHL 30 front wall												
			<u>main duct</u>		620-0107 620-0108 620-0135										
		1	connection to air duct		"	-	-		-	-	-	-			
		1	horizontal duct (d = 930), approx. 7m long		"	327	930		140	1,0	-	2			
		2	Cap for steel expansion joint (round)		"	327	930		140	1,0	-	2			
		2	bend approx. 45° (d = 930)		"	327	930		140	1,0	-	2			
		1	bend 90° (d = 930)		"	327	930		140	1,0	-	2			
		1	vertical duct (d = 930) from level approx. +27.900m to +23.000m		"	327	930		140	1,0	-	2			
		1	branch (d = 406) for duct to burner, at level approx. +25.800m		"	-	-		-	-	-	-			
		1	transition piece from (d = 930) to (d = 790) at level approx. +23.000m		"	327	930		140	1,0	-	2			
		1	vertical duct (d = 790) from level approx. +22.500m to +20.500m		"	327	790		140	1,0	-	2			
		1	branch (d = 406) for duct to burner, at level approx. +20.903m		"	-	-		-	-	-	-			
		1	transition piece from (d = 790) to (d = 690) at level approx. +20.000m		"	327	790		140	1,0	-	2			
	7.3.3	1	vertical duct (d = 690) from level approx. +20.000m to +17.000m		620-0107 620-0108 620-0135	327	690		140	1,0	-	2			
		1	branch (d = 508) for duct to burner, at level approx. +17.988m		"	-	-		-	-	-	-			
		1	transition piece from (d = 690) to (d = 508) at level approx. +17.000m		"	327	690		140	1,0	-	2			
		1	vertical duct (d = 508) from level approx. +17.000m to +15.328m		"	327	508		140	1,0	-	2			
		1	bend approx. 90° (d = 508)		"	327	508		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
			<u>duct to burner</u>		620-0107 620-0108 620-0135										
		2	connection to main duct at level approx. + 25.800m and +20.903m		"	-	-		-	-	-	-			
		2	horizontal duct (d = 406), at level approx + 25.800m and +20.903m, each approx. 3m long		"	327	508		140	1,0	-	2			
		4	Cap for steel expansion joints (round), 2 expansion joints per duct		"	327	508		140	1,0	-	2			
		1	bend approx. 45° (d = 406)		"	327	508		140	1,0	-	2			
		1	bend approx. 90° (d = 406)		"	327	508		140	1,0	-	2			
		1	damper (round)	01 HHL 30 AA 010	"	327	508		140	1,0	-	2			
		1	transition piece from round (d = 406) to rectangular		"	327	-		140	1,0	-	2			
		1	connection to main duct at level approx. + 17.988m		"	-	-		-	-	-	-			
		2	horizontal duct (d = 508), at level approx +17.988m and +15.328m, approx. 3m long		"	327	406		140	1,0	-	2			
		4	Cap for steel expansion joints (round)		"	327	406		140	1,0	-	2			
		2	bend approx. 45° (d = 508)		"	327	406		140	1,0	-	2			
		2	damper (round)	01 HHL 30 AA 004, 007	"	327	508		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	7.3.4		<u>core and cooling air to burner HHL 40 rear wall</u>												
			<u>main duct</u>		620-0107 620-0108 620-0135										
		1	connection to air duct		"	-	-		-	-	-	-			
		1	horizontal duct (d = 930), approx. 4.5m long		"	327	930		140	1,0	-	2			
		2	Cap for steel expansion joint (round)		"	327	930		140	1,0	-	2			
		1	bend approx. 45° (d = 930)		"	327	930		140	1,0	-	2			
		1	bend 90° (d = 930)		"	327	930		140	1,0	-	2			
		1	vertical duct (d = 930) from level approx. +27.900m to +23.000m		"	327	930		140	1,0	-	2			
	7.3.4	1	branch (d = 406) for duct to burner, at level approx. +25.800m		620-0107 620-0108 620-0135	-	-		-	-	-	-			
		1	transition piece from (d = 930) to (d = 790) at level approx. +23.000m		"	327	930		140	1,0	-	2			
		1	vertical duct (d = 790) from level approx. +22.500m to +20.500m		"	327	790		140	1,0	-	2			
		1	branch (d = 406) for duct to burner, at level approx. +20.903m		"	-	-		-	-	-	-			
		1	transition piece from (d = 790) to (d = 690) at level approx. +20.000m		"	327	790		140	1,0	-	2			
		1	vertical duct (d = 690) from level approx. +20.000m to +17.000m		"	327	690		140	1,0	-	2			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	branch (d = 508) for duct to burner, at level approx. +17.988m		"	-	-		-	-	-	-			
		1	transition piece from (d = 690) to (d = 508) at level approx. +17.000m		"	327	690		140	1,0	-	2			
		1	vertical duct (d = 508) from level approx. +17.000m to +15.328m		"	327	508		140	1,0	-	2			
		1	bend approx. 90° (d = 508)		"	327	508		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
			<u>duct to burner</u>		620-0107 620-0108 620-0135										
		2	connection to main duct at level approx. + 25.800 and +20.903m		"	-	-		-	-	-	-			
		2	horizontal duct (d = 406), at level approx + 25.800m, and +20.903m, each approx. 3m long		"	327	508		140	1,0	-	2			
		4	Cap for steel expansion joints (round), 2 expansion joints per duct		"	327	508		140	1,0	-	2			
		1	bend approx. 45° (d = 406)		"	327	508		140	1,0	-	2			
		1	bend approx. 90° (d = 406)		"	327	508		140	1,0	-	2			
		1	damper (round)	01 HHL 40 AA 010	"	327	508		140	1,0	-	2			
		1	transition piece from round (d = 406) to rectangular		"	327	-		140	1,0	-	2			
		1	connection to main duct at level approx. + 17.988m		"	-	-		-	-	-	-			
		2	horizontal duct (d = 508), at level approx +17.988m and +15.328m, approx. 3m long		"	327	406		140	1,0	-	2			
		4	Cap for steel expansion joints (round)		"	327	406		140	1,0	-	2			
		2	bend approx. 45° (d = 508)		"	327	406		140	1,0	-	2			
		2	damper (round)	01 HHL 40 AA 004, 007	"	327	508		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	7.3.5		<u>core and cooling air to burner HHL 50 left side wall</u>												
			<u>main duct</u>		620-0107 620-0108 620-0135										
		1	connection to air duct		"	-	-		-	-	-	-			
		1	horizontal duct (d = 930), approx. 7m long		"	327	930		140	1,0	-	2			
		1	bend approx. 90° (d = 930)		"	327	930		140	1,0	-	2			
		2	Cap for steel expansion joint (round)		"	327	930		140	1,0	-	2			
		1	bend 90° (d = 930)		"	327	930		140	1,0	-	2			
		1	branch (d = 406) for duct to burner, at level approx. +25.800m		"	327	930		140	1,0	-	2			

Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	III. Air ducts	13.08.2008

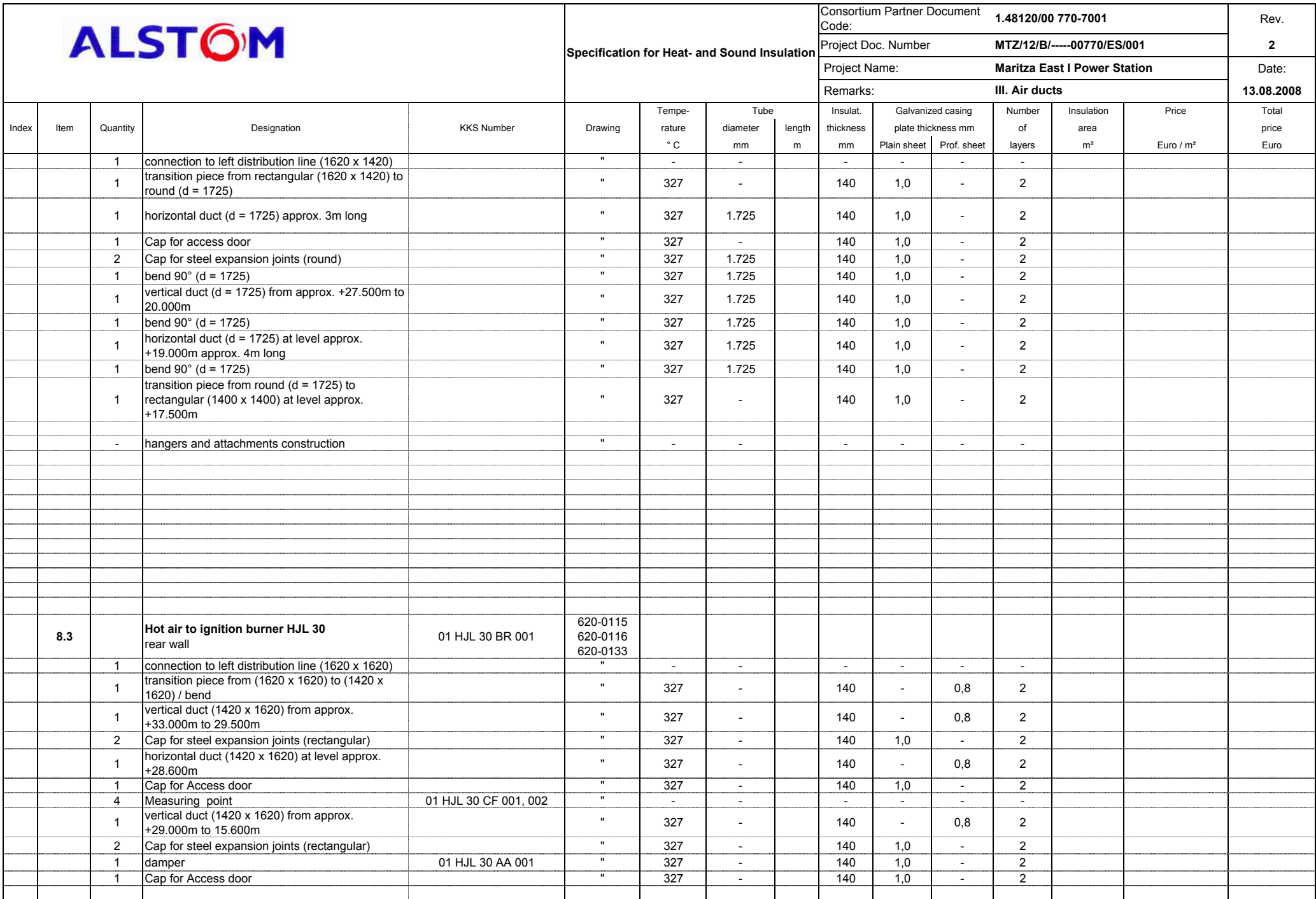
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	transition piece from (d = 930) to (d = 790) at level approx. +23.000m		"	327	930		140	1,0	-	2			
		1	vertical duct (d = 790) from level approx. +22.500m to +20.000m		"	327	790		140	1,0	-	2			
		1	brunch (d = 406) for duct to burner, at level approx. +20.903m		"	-	-		-	-	-	-			
		1	transition piece from (d = 790) to (d = 690) at level approx. +20.000m		"	327	790		140	1,0	-	2			
		1	vertical duct (d = 690) from level approx. +19.500m to +17.000m		"	327	690		140	1,0	-	2			
		1	brunch (d = 508) for duct to burner, at level approx. +17.988m		"	-	-		-	-	-	-			
		1	transition piece from (d = 690) to (d = 508) at level approx. +17.000m		"	327	690		140	1,0	-	2			
		1	vertical duct (d = 508) from level approx. +17.000m to +15.328m		"	327	508		140	1,0	-	2			
		1	bend approx. 90° (d = 508)		"	327	508		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
			<u>duct to burner</u>		620-0107 620-0108 620-0135										
		2	connection to main duct at level approx. + 25.800m and +20.903m		"	-	-		-	-	-	-			
		2	horizontal duct (d = 406), at level approx. + 25.800m and +20.903m, each approx. 3m long		"	327	508		140	1,0	-	2			
		4	Cap for steel expansion joints (round), 2 expansion joints per duct		"	327	508		140	1,0	-	2			
		1	bend approx. 45° (d = 406)		"	327	508		140	1,0	-	2			
		1	bend approx. 90° (d = 406)		"	327	508		140	1,0	-	2			
		1	damper (round)	01 HHL 50 AA 010	"	327	508		140	1,0	-	2			
	7.3.5	1	transition piece from round (d = 406) to rectangular		620-0107 620-0108 620-0135	327	-		140	1,0	-	2			
		1	connection to main duct at level approx. + 17.988m		"	-	-		-	-	-	-			
		2	horizontal duct (d = 508), at level approx +17.988m and +15.328m, approx. 3m long		"	327	406		140	1,0	-	2			
		4	Cap for steel expansion joints (round)		"	327	406		140	1,0	-	2			
		2	bend approx. 45° (d = 508)		"	327	406		140	1,0	-	2			
		2	damper (round)	01 HHL 50 AA 004, 007	"	327	508		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	7.3.6		<u>core and cooling air to burner HHL 60 rear wall</u>												
			<u>main duct</u>		620-0107 620-0108 620-0135										

Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	III. Air ducts	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	connection to air duct		"	-	-		-	-	-	-			
		1	horizontal duct (d = 930), approx. 7m long		"	327	930		140	1,0	-	2			
		2	Cap for steel expansion joint (round)		"	327	930		140	1,0	-	2			
		2	bend approx. 45° (d = 930)		"	327	930		140	1,0	-	2			
		1	bend 90° (d = 930)		"	327	930		140	1,0	-	2			
		1	vertical duct (d = 930) from level approx. +27.900m to +23.000m		"	327	930		140	1,0	-	2			
		1	branch (d = 406) for duct to burner, at level approx. +25.800m		"	327	-		-	-	-	-			
		1	transition piece from (d = 930) to (d = 790) at level approx. +23.000m		"	327	930		140	1,0	-	2			
		1	vertical duct (d = 790) from level approx. +22.500m to +20.500m		"	327	790		140	1,0	-	2			
		1	branch (d = 406) for duct to burner, at level approx. +20.903m		"	-	-		-	-	-	-			
		1	transition piece from (d = 790) to (d = 690) at level approx. +20.000m		"	327	790		140	1,0	-	2			
		1	vertical duct (d = 690) from level approx. +20.000m to +17.000m		"	327	690		140	1,0	-	2			
		1	branch (d = 508) for duct to burner, at level approx. +17.988m		"	-	-		-	-	-	-			
		1	transition piece from (d = 690) to (d = 508) at level approx. +17.000m		"	327	690		140	1,0	-	2			
		1	vertical duct (d = 508) from level approx. +17.000m to +15.328m		"	327	508		140	1,0	-	2			
		1	bend approx. 90° (d = 508)		"	327	508		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	7.3.6		<u>duct to burner</u>		620-0107 620-0108 620-0135										
		2	connection to main duct at level approx. + 25.800m and +20.903m		"	-	-		-	-	-	-			
		2	horizontal duct (d = 406), at level approx. + 25.800m and +20.903m, each approx. 3m long		"	327	508		140	1,0	-	2			
		4	Cap for steel expansion joints (round), 2 expansion joints per duct		"	327	508		140	1,0	-	2			
		1	bend approx. 45° (d = 406)		"	327	508		140	1,0	-	2			
		1	bend approx. 90° (d = 406)		"	327	508		140	1,0	-	2			
		1	damper (round)	01 HHL 60 AA 010	"	327	508		140	1,0	-	2			
		1	connection to main duct at level approx. + 17.988m		"	-	-		-	-	-	-			
		2	horizontal duct (d = 508), at level approx. +17.988m and +15.328m, approx. 3m long		"	327	406		140	1,0	-	2			
		4	Cap for steel expansion joints (round)		"	327	406		140	1,0	-	2			

Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	III. Air ducts	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		2	bend approx. 45° (d = 508)		"	327	406		140	1,0	-	2			
		1	transition piece from round (d = 406) to rectangular		"	327	-		140	1,0	-	2			
		2	damper (round)	01 HHL 60 AA 004, 007	"	327	508		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	8		<u>Air ducts to the start-up burners</u>												
	8.1		Hot air to ignition burner HJL 10 front wall	01 HJL 10 BR 001	620-0115 620-0116 620-0133										
		1	connection to right distribution line (1620 x 1420)		"	-	-		-	-	-	-			
		1	horizontal rectangular duct (1620 x 1420), approx. at level +34.025m, approx. 9m long		"	327	-		140	-	0,8	2			
		2	Cap for steel expansion joints		"	327	-		140	1,0	-	2			
		1	transition piece from rectangular (1620 x 1420) to round (d = 1725)		"	327	-		140	1,0	-	2			
		1	horizontal duct (d = 1725) approx. 3m long		"	327	1.725		140	1,0	-	2			
		1	Cap for access door		"	327	-		140	1,0	-	2			
		1	bend 90° (d = 1725)		"	327	1.725		140	1,0	-	2			
		1	vertical duct (d = 1725) from approx. +33.000m to 29.800m		"	327	1.725		140	1,0	-	2			
		1	bend 90° (d = 1725)		"	327	1.725		140	1,0	-	2			
		1	horizontal duct (d = 1725)		"	327	1.725		140	1,0	-	2			
		4	Measuring point	01 HJL 10 CF 001, 002	"	-	-		-	-	-	-			
		1	bend 40° (d = 1725)		"	327	1.725		140	1,0	-	2			
		2	Cap for steel expansion joints (round)		"	327	1.725		140	1,0	-	2			
		1	Cap for Access door		"	327	-		140	1,0	-	2			
		1	bend 50° (d = 1725)		"	327	1.725		140	1,0	-	2			
	8.1	1	bend 90° (d = 1725)		620-0115 620-0116 620-0133	327	1.725		140	1,0	-	2			
		1	vertical duct (d = 1725) from approx. +27.500m to 22.800m		"	327	1.725		140	1,0	-	2			
		1	transition piece from round (d = 1725) to rectangular (1400 x 1400) at level approx. +22.800m		"	327	-		140	1,0	-	2			
		1	rectangular duct to ignition burner (1400 x 1400), from approx. +21.800 to +15.600m		"	327	-		140	1,0	-	2			
		2	Cap for steel expansion joints (rectangular)		"	327	-		140	1,0	-	2			
		1	damper	01 HJL 10 AA 001	"	327	-		140	1,0	-	2			
		1	Cap for Access door		"	327	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	8.2		Hot air to ignition burner HJL 20 left side wall	01 HJL 20 BR 001	620-0115 620-0116 620-0133										



Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	8.4		Hot air to ignition burner HJL 40 right side wall	01 HJL 40 BR 001	620-0115 620-0116 620-0133										
		1	connection to right distribution line (1620 x 1420)		"	-	-		-	-	-	-			
		1	transition piece from (1900 x 1420) to (1420 x 1620)		"	327	-		140	-	0,8	2			
		1	horizontal duct (1420 x 1620) at level approx. +34.025m		"	327	-		140	-	0,8	2			
		2	Cap for steel expansion joints (rectangular)		"	327	-		140	1,0	-	2			
		1	vertical duct (1420 x 1620) from approx. +33.500m to 19.500m		"	327	-		140	-	0,8	2			
		4	Measuring point	01 HJL 40 CF 001, 002	"	-	-		-	-	-	-			
		1	Cap for access door		"	-	-		140	1,0	-	2			
		1	damper at approx +22.500m	01 HJL 40 AA 001	"	327	-		140	1,0	-	2			
		1	horizontal duct (1420 x 1620) at level approx. +19.000m		"	327	-		140	-	0,8	2			
		2	Cap for steel expansion joints (rectangular)		"	327	-		140	1,0	-	2			
		1	vertical duct (1420 x 1620) from approx. +19.000m to 15.600m		"	327	-		140	-	0,8	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	9		Air duct to mills												
	9.1		Hot air to mill (HFE10) rear wall	01 HFE 10 BR 001	620-0117 620-0118 620-0130										
		1	connection to right distribution line (1560 x 1560)		"	-	-		-	-	-	-			
		1	vertical duct (1560 x 1560) from approx. +38.700m to 42.780m		"	327	-		140	-	0,8	2			
		2	Cap for steel expansion joints (rectangular)		"	327	-		140	1,0	-	2			
		1	horizontal duct (1560 x 1560) at level approx. +42.780m		"	327	-		140	-	0,8	2			
		1	Cap for access door		"	327	-		140	1,0	-	2			
		4	Measuring point	01 HFE 10 CF 001, 002	"	-	-		140	-	-	2			
		1	damper	01 HFE 10 AA 001	"	327	-		140	1,0	-	2			
		2	Cap for steel expansion joints (rectangular)		"	327	-		140	1,0	-	2			
		2	ducts to flue gas resuction duct head (780 x 1560)		"	327	-		140	-	0,8	2			
		2	steel expansion joints (rectangular)		"	327	-		140	1,0	-	2			
									140			2			
		1	Primary Air wind box		620-0137	327	-		140	1,0	-	2			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	9.2		Hot air to mill (HFE20) right side wall	01 HFE 20 BR 001	620-0117 620-0118 620-0130										
		1	connection to right distribution line (1900 x 1280)		"	-	-		-	-	-	-			
		1	transition piece from 1900 x 1280 to 1560 x 1560		"	327	-		140	-	0,8	2			
		1	vertical duct (1560 x 1560) from approx. +38.700m to 42.780m		"	327	-		140	-	0,8	2			
		1	horizontal duct (1560 x 1560) at level approx. +42.780m		"	327	-		140	-	0,8	2			
		1	Cap for access door		"	327	-		140	1,0	-	2			
		1	damper	01 HFE 20 AA 001	"	327	-		140	1,0	-	2			
		1	Cap for steel expansion joint (rectangular)		"	327	-		140	1,0	-	2			
		2	ducts to flue gas resuction duct head (780 x 1560)		"	327	-		140	1,0	-	2			
		2	Cap for steel expansion joints (rectangular)		"	327	-		140	1,0	-	2			
		1	Primary Air wind box		620-0137	327	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	9.3		Hot air to mill (HFE30) front wall	01 HFE 30 BR 001	620-0117 620-0118 620-0130										
		1	connection to right distribution line (1900 x 1280)		"	-	-		-	-	-	-			
		1	bend duct (1900 x 1280) to level approx. +37.000m		"	327	-		140	-	0,8	2			
		1	transition piece from rectangular (1900 x 1280) to round (d = 1760)		"	327	-		140	-	0,8	2			
		1	bend 90° (d = 1760)		"	327	1.760		140	1,0	-	2			
		1	horizontal duct (d = 1760) at level approx. +42.780m		"	327	1.760		140	1,0	-	2			
		2	Cap for steel expansion joints (round)		"	327	1.760		140	1,0	-	2			
		1	damper (round)	01 HFE 30 AA 001	"	327	1.760		140	1,0	-	2			
		1	Cap for access door		"	327	-		140	1,0	-	2			
		1	Transition piece from round (d = 1760) to rectangular (1560 x 1560)		"	327	-		140	1,0	-	2			
		1	Cap for steel expansion joints (rectangular)		"	327	-		140	1,0	-	2			
		2	ducts to flue gas resuction duct head (780 x 1560)		"	327	-		140	1,0	-	2			
		2	Cap for steel expansion joints (rectangular)		"	327	-		140	1,0	-	2			



Specification for Heat- and Sound Insulation

Consortium Partner Document Code: 1.48120/00 770-7001

Project Doc. Number	MTZ/12/B/-----00770/ES/001
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Project Name:	Maritza East Power Station
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Remarks:	III. Air ducts
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Rev.

2

Date: _____

13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	Primary Air wind box		620-0137	327	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	9.4		Hot air to mill (HFE40) front wall	01 HFE 40 BR 001	620-0117 620-0118 620-0130										
		1	connection to left distribution line (1900 x 1280)		"	-	-								
		1	bend duct (1900 x 1280) to level approx. +38.500m		"	327	-		140	-	0,8	2			
		1	transition piece from rectangular (1900 x 1280) to round (d = 1760)		"	327	-		140	1,0	-	2			
		1	bend 90° (d = 1760)		"	327	1.760		140	1,0	-	2			
		1	horizontal duct (d = 1760) at lavel approx. +42.780m, approx. 18m long.		"	327	1.760		140	1,0	-	2			
		2	Cap for steel expansion joints (round)		"	327	1.760		140	1,0	-	2			
		1	damper (round)	01 HFE 40 AA 001	"	327	1.760		140	1,0	-	2			
		1	Cap for Access door		"	327	-		140	1,0	-	2			
		1	Transition piece from round (d = 1760) to rectangular (1560 x 1560)		"	327	-		140	1,0	-	2			
		1	Cap for steel expansion joint (rectangular)		"	327	-		140	1,0	-	2			
	9.4	2	ducts to flue gas resuction duct head (780 x 1560)		620-0117 620-0118 620-0130	327	-		140	1,0	-	2			
		2	Cap for steel expansion joints (rectangular)		"	327	-		140	1,0	-	2			
		1	Primary Air wind box		620-0137	327	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	9.5		Hot air to mill (HFE50) left side wall	01 HFE 50 BR 001	620-0117 620-0118 620-0130										
		1	connection to left distribution line (1900 x 1280)		"	-	-								
		1	transition piece from 1900 x 1280 to 1560 x 1560		"	327	-		140	-	0,8	2			
		1	vertical duct (1560 x 1560) from approx. +38.700m to 42.780m		"	327	-		140	-	0,8	2			
		1	horizontal duct (1560 x 1560) at level approx. +42.780m approx. 6m long		"	327	-		140	-	0,8	2			
		1	Cap for access door		"	327	-		140	1,0	-	2			
		1	damper	01 HFE 50 AA 001	"	327	-		140	1,0	-	2			
		1	Cap for steel expansion joint (rectangular)		"	327	-		140	1,0	-	2			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		2	ducts to flue gas resuction duct head (780 x 1560)		"	327	-		140	1,0	-	2			
		2	Cap for steel expansion joints (rectangular)		"	327	-		140	1,0	-	2			
		1	Primary Air wind box		620-0137	327	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	9.6		Hot air to mill (HFE60) rear wall	01 HFE 60 BR 001	620-0117 620-0118 620-0130										
		1	connection to left distribution line (1560 x 1560)		"	-	-								
		1	vertical duct (1560 x 1560) from approx. +38.700m to 42.780m		"	327	-		140	-	0,8	2			
		2	Cap for steel expansion joints (rectangular)		"	327	-		140	-	0,8	2			
		1	horizontal duct (1560 x 1560) at level approx. +42.780m approx. 17m long		"	327	-		140	-	0,8	2			
		1	Cap for access door		"	327	-		140	1,0	-	2			
		4	Measuring point	01 HFE 60 CF 001, 002	"	-	-		-	-	-	-			
		1	damper	01 HFE 60 AA 001	"	327	-		140	1,0	-	2			
		2	Cap for steel expansion joints (rectangular)		"	327	-		140	1,0	-	2			
	9.6	2	ducts to flue gas resuction duct head (780 x 1560)		620-0117 620-0118 620-0130	327	-		140	1,0	-	2			
		2	Cap for steel expansion joints (rectangular)		"	327	-		140	1,0	-	2			
		1	Primary Air wind box		620-0137	327	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	10		Air ducts for wall protection air.												
	10.1		Wall protection air to front wall (HHL06)												
			<u>Main duct HHL06</u>	01 HHL 06 BR 001	620-0121 620-0122 620-0134										
		1	connection to left distribution line (d = 1050) at level approx. +36.050m		"	-	-								
		1	horizontal duct (d = 1050) at level approx +36.050		"	327	1.050		140	1,0	-	2			
		1	bend 45° (d = 1050)		"	327	1.050		140	1,0	-	2			
		2	Cap for steel expansion joints (ruond)		"	327	1.050		140	1,0	-	2			
		1	bend 90° (d = 1050)		"	327	1.050		140	1,0	-	2			

Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	III. Air ducts	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	vertical duct (d = 1050) from level approx. +36.050m to level approx +27.650m		"	327	1.050		140	1,0	-	2			
		1	Cap for steel expansion joints (ruond) at level approx. +32.000m		"	327	1.050		140	1,0	-	2			
		1	bend 90° (d = 1050)		"	327	1.050		140	1,0	-	2			
		1	horizontal duct (d = 1050) at level approx +27.650		"	327	1.050		140	1,0	-	2			
		1	bend 90° (d = 1050)		"	327	1.050		140	1,0	-	2			
		2	Cap for steel expansion joints (ruond)		"	327	1.050		140	1,0	-	2			
		1	bend 40° (d = 1050)		"	327	1.050		140	1,0	-	2			
		1	bend 50° (d = 1050)		"	327	1.050		140	1,0	-	2			
		1	bend 45° (d = 1050)		"	327	1.050		140	1,0	-	2			
		4	Measuring point	01 HHL 06 CF 001, 002	"	-	-								
		1	Cap for access door		"	327	-		140	1,0	-	2			
		1	damper	01 HHL 06 AA 001	"	327	1.050		140	1,0	-	2			
		2	Cap for steel expansion joints (ruond)		"	327	1.050		140	1,0	-	2			
		1	bend 90° (d = 1050)		"	327	1.050		140	1,0	-	2			
		1	vertical duct (d = 1050) from level approx. +27.650m to level approx +26.200m		"	327	1.050		140	1,0	-	2			
		1	branche for duct to wall (d = 711) at level approx. +26.200m		"	-	-		-	-	-	-			
	10.1	1	transition piece from (d = 1050) to (d = 990)		620-0121 620-0122 620-0134	327	1.050		140	1,0	-	2			
		1	vertical duct (d = 990) from level approx. +25.000m to level approx +21.500m		"	327	990		140	1,0	-	2			
		1	Cap for steel expansion joints (ruond) at level approx. +22.000m		"	327	990		140	1,0	-	2			
		1	branche for duct to wall (d = 711) at level approx. +20.700m		"	-	-		-	-	-	-			
		1	transition piece from (d = 990) to (d = 711)		"	327	990		140	1,0	-	2			
		1	vertical duct (d = 711) from level approx. +19.700m to level approx +12.000m		"	327	711		140	1,0	-	2			
		1	Cap for steel expansion joints (ruond) at level approx. +15.000m		"	327	711		140	1,0	-	2			
		1	bend 90° (d = 711) at level approx. +12.000m		"	327	711		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
			<u>Brunch ducts to front wall</u>		"										
		3	dampers (round) at level approx. +26.200m, +20.700m, +12.000m	01 HHL 06 AA 002 - 004	"	327	711		140	1,0	-	2			
		3	bend 45° (d = 711)		"	327	711		140	1,0	-	2			
		3	Fabric expansion joint Only PERSONAL PROTECTION made of perforated sheet, WITHOUT INSULATION		"	327	-		-	Pref. Sheet 1,0	-	-			
		3	transition piece from (d = 711) to (d = 425)		"	327	711		140	1,0	-	2			

Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	III. Air ducts	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		3	connection to front wall (d = 425) at level approx. +26.200m, +20.700m, +12.000m		"	-	-		-	-	-	-			
	10.2		Wall protection air to left side wall (HHL07)												
			<u>Main duct HHL07</u>	01 HHL 07 BR 001	620-0121 620-0122 620-0134										
		1	connection to left distribution line (d = 1050) at level approx. +37.700m		"	-	-		-	-	-	-			
		1	horizontal duct (d = 1050) at level approx +37.700, approx 12m long		"	327	1.050		140	1,0	-	2			
		1	bend 45° (d = 1050)		"	327	1.050		140	1,0	-	2			
		2	Cap for steel expansion joints (ruond)		"	327	1.050		140	1,0	-	2			
		4	Measuring point	01 HHL 07 CF 001, 002	"	-	-		-	-	-	-			
		1	Cap for access door		"	327	-		140	1,0	-	2			
		1	bend 90° (d = 1050)		"	327	1.050		140	1,0	-	2			
		1	vertical duct (d = 1050) from level approx. +37.700m to level approx +26.2000m		"	327	1.050		140	1,0	-	2			
		1	damper (round) at level approx. +34.000m	01 HHL 07 AA 001	"	327	1.050		140	1,0	-	2			
		1	branche for duct to wall (d = 711) at level approx. +26.200m		"	-	-		-	-	-	-			
	10.2	1	transition piece from (d = 1050) to (d = 990) at level approx. +25,400m		620-0121 620-0122 620-0134	327	1.050		140	1,0	-	2			
		1	vertical duct (d = 990) from level approx. +26.200m to level approx +15.000m		"	327	990		140	1,0	-	2			
		1	bend 90° (d = 990) at level approx +15.000m		"	327	990		140	1,0	-	2			
		1	horizontal duct (d = 990) at level approx +15.000m		"	327	990		140	1,0	-	2			
		2	Cap for steel expansion joints (ruond)		"	327	990		140	1,0	-	2			
		2	branche for duct to wall (d = 711) at level approx. +15.000m		"	-	-		-	-	-	-			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
			<u>Brunch ducts to left side wall</u>		"										
		1	horizontal duct (d = 711) at level approx. +26.200m		"	327	711		140	1,0	-	2			
		2	Cap for steel expansion joints (ruond)		"	327	990		140	1,0	-	2			
		1	dampers (round) at level approx. +26.200m	01 HHL 07 AA 002	"	327	711		140	1,0	-	2			
		1	transition piece from (d = 711) to (d = 425)		"	327	711		140	1,0	-	2			
		1	connection to front wall (d = 425) at level approx. +26.200m		"	-	-		-	-	-	-			
		1	Vertical duct from level approx. +15.000m to +20.700m												
		1	damper (round) at level approx. +18.000m	01 HHL 07 AA 003	"	327	711		140	1,0	-	2			
		1	bend 90° (d = 711) at level approx +20.700m		"	327	990		140	1,0	-	2			



Specification for Heat- and Sound Insulation

Consortium Partner Document Code: 1.48120/00 770-7001

Project Doc. Number	MTZ/12/B/----00770/ES/001
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Project Name:	Maritza East I Power Station
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Remarks:	III. Air ducts
----------	----------------

Rev.

2

Date:

13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube		Insulat. thickness mm	Galvanized casing plate thickness mm		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
							diameter mm	length m		Plain sheet	Prof. sheet				
		1	Fabric expansion joint Only PERSONAL PROTECTION made of perforated sheet, WITHOUT INSULATION		"	327	-		-	Pref. Sheet 1,0	-	-			
		1	transition piece from (d = 711) to (d = 425)		"	327	711		140	1,0	-	2			
		1	connection to front wall (d = 425) at level approx. +20.700m		"	-	-		-	-	-	-			
		1	Vertical duct from level approx. +15.000m to +12.000m												
		1	damper (round) at level approx. +14.000m	01 HHL 07 AA 004	"	327	711		140	1,0	-	2			
		1	bend 90° (d = 711) at level approx +12.000m		"	327	990		140	1,0	-	2			
		1	Fabric expansion joint Only PERSONAL PROTECTION made of perforated sheet, WITHOUT INSULATION		"	327	-		-	Pref. Sheet 1,0	-	-			
		1	transition piece from (d = 711) to (d = 425)		"	327	711		140	1,0	-	2			
		1	connection to front wall (d = 425) at level approx. +12.000m		"	-	-		-	-	-	-			
	10.3		Wall protection air to rear wall (HHL08)												
			<u>Main duct HHL08</u>	01 HHL 08 BR 001	620-0121 620-0122 620-0134										
		1	connection to left distribution line (d = 1050) at level approx. +36.050m		"	-	-		-	-	-	-			
		1	horizontal duct (d = 1050) at level approx +36.050		"	327	1.050		140	1,0	-	2			
		2	Cap for steel expansion joints (ruond)		"	327	1.050		140	1,0	-	2			
		4	Measuring point	01 HHL 08 CF 001, 002	"	-	-		-	-	-	-			
		1	bend approx. 10° (d = 1050)		"	327	1.050		140	1,0	-	2			
		1	Cap for access door		"	-	-		-	-	-	-			
		1	bend approx. 90° (d = 1050)		"	327	1.050		140	1,0	-	2			
		1	bend 45° (d = 1050)		"	327	1.050		140	1,0	-	2			
		1	vertical duct (d = 1050) from level approx. +36.050m to level approx +26.200m		"	327	1.050		140	1,0	-	2			
		1	damper (round) at level approx. +34.000m	01 HHL 08 AA 001	"	327	1.050		140	1,0	-	2			
		2	Cap for steel expansion joints (ruond) at level approx. +30.500m and +27.500m		"	327	1.050		140	1,0	-	2			
		1	branche for duct to wall (d = 711) at level approx. +26.200m		"	-	-		-	-	-	-			
		1	transition piece from (d = 1050) to (d = 990)		"	327	1.050		140	1,0	-	2			
		1	vertical duct (d = 990) from level approx. +25.000m to level approx +20.700m		"	327	990		140	1,0	-	2			
		1	Cap for steel expansion joints (round) at level approx. +22.000m		"	327	990		140	1,0	-	2			



Rev

2

Date: _____

13.08.2008

ALSTOM Power Boiler GmbH

Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	III. Air ducts	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		2	Cap for steel expansion joints (ruond) at level approx. +32.500m and +30.500		"	327	1.050		140	1,0	-	2			
		1	bend 90° (d = 1050)		"	327	1.050		140	1,0	-	2			
		1	horizontal duct (d = 1050) at level approx +27.650		"	327	1.050		140	1,0	-	2			
		1	bend 35° (d = 1050)		"	327	1.050		140	1,0	-	2			
		4	Measuring point	01 HHL 09 CF 001, 002	"	-	-		-	-	-	-			
		1	damper	01 HHL 09 AA 001	"	327	1.050		140	1,0	-	2			
		2	Cap for steel expansion joints (ruond)		"	327	1.050		140	1,0	-	2			
		1	Cap for Access door		"	327	-		140	1,0	-	2			
		1	bend 90° (d = 1050)		"	327	1.050		140	1,0	-	2			
		1	branche for duct to wall (d = 711) at level approx. +26.200m		"	-	-		-	-	-	-			
		1	transition piece from (d = 1050) to (d = 990)		"	327	1.050		140	1,0	-	2			
		1	vertical duct (d = 990) from level approx. +25.000m to level approx +21.500m		"	327	990		140	1,0	-	2			
	10.4	1	Cap for steel expansion joints (round) at level approx. +22.000m		620-0121 620-0122 620-0134	327	990		140	1,0	-	2			
		1	branche for duct to wall (d = 711) at level approx. +20.700m		"	-	-		-	-	-	-			
		1	transition piece from (d = 990) to (d = 711)		"	327	990		140	1,0	-	2			
		1	vertical duct (d = 711) from level approx. +20.000m to level approx +12.000m		"	327	711		140	1,0	-	2			
		1	Cap for steel expansion joints (round) at level approx. +16.000m		"	327	711		140	1,0	-	2			
		1	bend 90° (d = 711) at level approx. +12.000m		"	327	711		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
			Brunch ducts to right side wall		"										
		3	dampers (round) at level approx. +26.200m, +20.700m, +12.000m	01 HHL 09 AA 002 - 004	"	327	711		140	1,0	-	2			
		3	duct 45° (d = 711)		"	327	711		140	1,0	-	2			
		3	Fabric expansion joint Only PERSONAL PROTECTION made of perforated sheet, WITHOUT INSULATION		"	327	-		-	Pref. Sheet 1,0	-	-			
		3	transition piece from (d = 711) to (d = 425)		"	327	711		140	1,0	-	2			
		3	connection to front wall (d = 425) at level approx. +26.200m, +20.700m, +12.000m		"	-	-		-	-	-	-			
		3	Measuring point	01 HHL 09 CT 501 - 503	"	-	-		-	-	-	-			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	11		Overfire air		620-0109 620-0110 620-0111 620-0112 620-0126 620-0127										
	11.1		Main overfire air duct to OFA1 and OFA2, left side and rear wall. (HHL01, HHL03)	01 HHL 01 BR 001 01 HHL 03 BR 001	"										
		1	connection to left distribution line (3240 x 1620) at level approx. +38.715m		"	-	-		-	-	-	-			
		1	vertical duct (3240 x 1620) from level approx. +38.715m to +45.400m		"	327	-		140	-	0,8	2			
		2	Cap for steel expansion joints (rectangular) at level approx. +39.500m and +43.000m		"	327	-		140	-	0,8	2			
		1	horizontal duct (3240 x 1620) at level approx. +45.400m, approx. 13m long.		"	327	-		140	-	0,8	2			
		2	damper (HHL01AA001, HHL02AA001)	01 HHL 01, 03 AA 001	"	327	-		140	1,0	-	2			
		8	Measuring point (4 for OFA1 and 4 for OFA2)	01 HHL 01, 03 CF 001, 002	"	-	-		-	-	-	-			
		2	Cap for access door for OFA1 and OFA2 duct		"	-	-		140	1,0	-	2			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	11.2		Main overfire air duct to OFA1 and OFA2, right side and front wall. (HHL02, HHL04)	01 HHL 02 BR 001 01 HHL 04 BR 001	"										
		1	connection to right distribution line (3240 x 1620) at level approx. +38.715m		"	-	-		-	-	-	-			
		1	vertical duct (3240 x 1620) from level approx. +38.715m to +45.400m		"	327	-		140	-	0,8	2			
		2	Cap for steel expansion joints (rectangular) at level approx. +39.500m and +43.000m		"	327	-		140	-	0,8	2			
		1	horizontal duct (3240 x 1620) at level approx. +45.400m		"	327	-		140	-	0,8	2			
		1	Cap for steel expansion joint (rectangular)		"	327	-		140	-	0,8	2			
		1	Cap for access door for OFA2		"	327	-		140	1,0	-	2			
		8	Measuring point (4 for OFA1 and 4 for OFA2)	01 HHL 02, 04 CF 001, 002	"	-	-		-	-	-	-			
		2	damper (HHL01AA001, HHL02AA001)	01 HHL 02, 04 AA 001	"	327	-		140	1,0	-	2			
		2	Access doors (1 for OFA1 and 1 for OFA2)		"	-	-		140	1,0	-	2			
		1	connection (d = 1016) for OFA1 to right side wall		"	-	-		-	-	-	-			
		1	transition piece from 3240 x 1620 to approx 2960 x 1620		"	327	-		140	-	0,8	2			
		1	horizontal duct approx. (2960 x 1620) at level approx. +45.400m		"	327	-		140	-	0,8	2			
		1	connection (d = 1016) for OFA2 to right side wall		"	-	-		-	-	-	-			



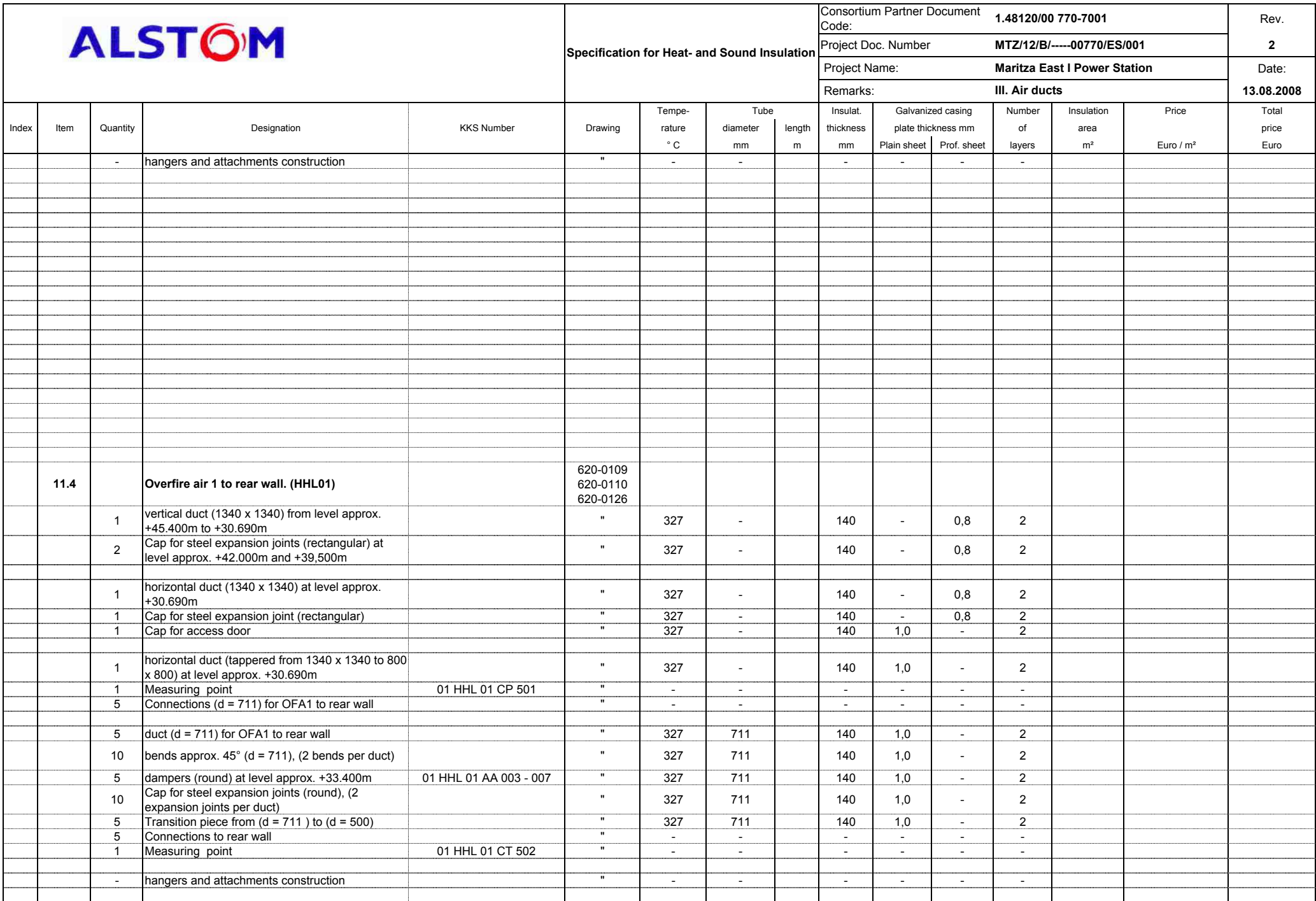
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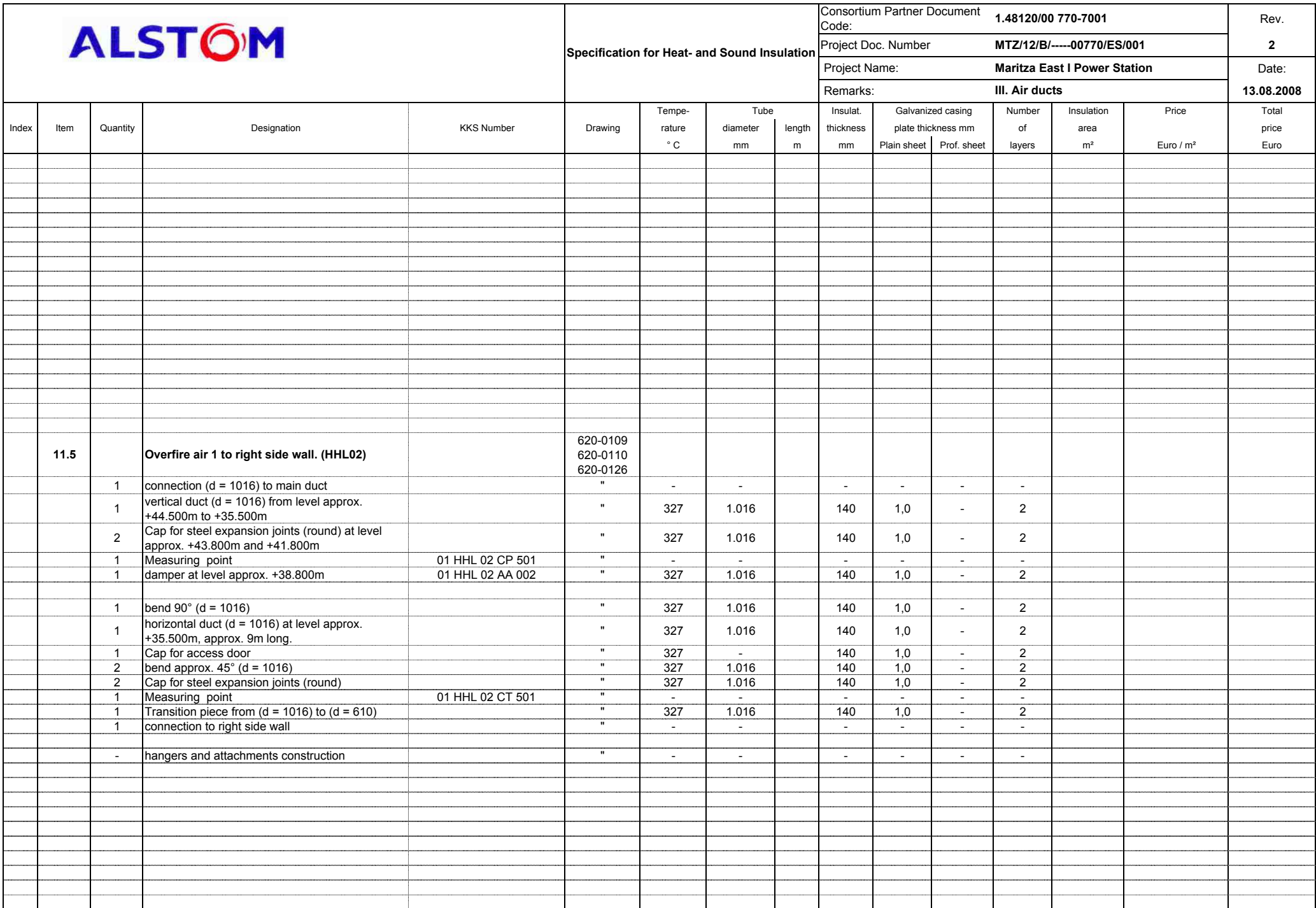
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Date:

13.08.2008

ALSTOM Power Boiler GmbH







Project Doc. Number	MTZ/12/B/-----00770/ES/001
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Project Name:	Maritza East I Power Station
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Remarks:	III. Air ducts
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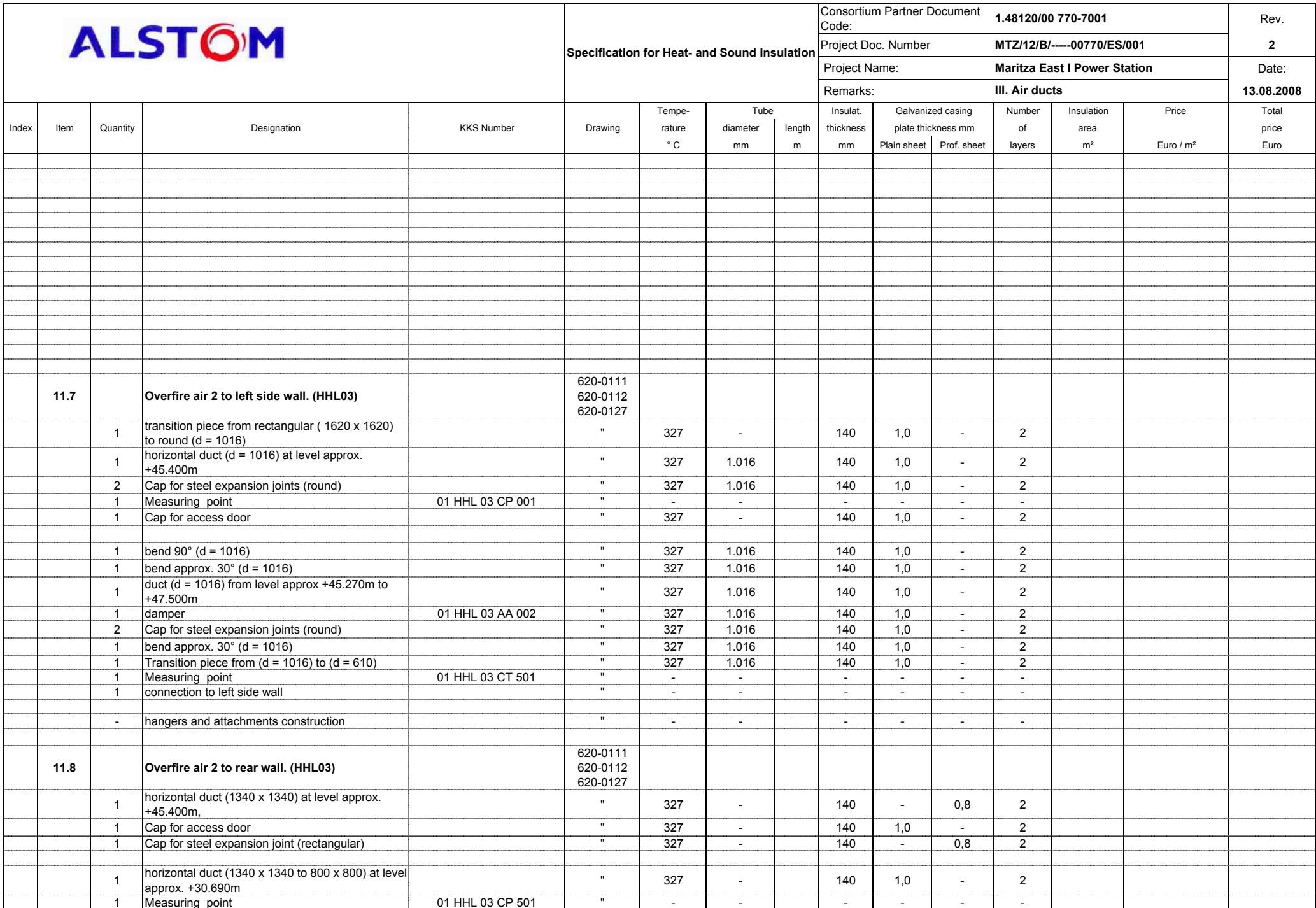
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Date:

13.08.2008

ALSTOM Power Boiler GmbH



Consortium Partner Document Code:	1.48120/00 770-7001	Rev.
Project Doc. Number	MTZ/12/B/-----00770/ES/001	2
Project Name:	Maritza East I Power Station	Date:
Remarks:	III. Air ducts	13.08.2008

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		5	Connections (d = 711) for OFA2 to rear wall		"	-	-		-	-	-	-			
		5	horizontal duct (d = 711) for OFA2 to rear wall at level approx. +47.500m		"	327	711		140	1,0	-	2			
		5	bends approx. 90° (d = 711)		"	327	711		140	1,0	-	2			
		5	dampers (round) at level approx. +47.500m	01 HHL 03 AA 003 - 007	"	327	711		140	1,0	-	2			
		10	Cap for steel expansion joints (round), (2 expansion joints per duct)		"	327	711		140	1,0	-	2			
		5	Transition piece from (d = 711) to (d = 500)		"	327	711		140	1,0	-	2			
		5	Connections to rear wall		"	-	-		-	-	-	-			
		1	Measuring point	01 HHL 03 CT 502	"	-	-		-	-	-	-			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	11.9		Overfire air 2 to right side wall. (HHL04)		620-0111 620-0112 620-0127										
		1	duct (d = 1016) from level approx +45.400m to +47.500m		"	327	1.016		140	1,0	-	2			
		1	Measuring Point	01 HHL 04 CP 501	"	-	-		-	-	-	-			
		1	damper (HHL03AA002)	01 HHL 04 AA 002	"	327	1.016		140	1,0	-	2			
		2	Cap for steel expansion joints (round)		"	327	1.016		140	1,0	-	2			
		2	bend approx. 30° (d = 1016)		"	327	1.016		140	1,0	-	2			
		1	Transition piece from (d = 1016) to (d = 610)		"	327	1.016		140	1,0	-	2			
		1	Measuring Point	01 HHL 04 CT 501	"	-	-		-	-	-	-			
		1	connection to right side wall		"	-	-		-	-	-	-			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	11.10		Overfire air 2 to front wall. (HHL04)		620-0111 620-0112 620-0127										
		1	horizontal duct (1340 x 1340) at level approx. +45.400m, approx. 9m long.		"	327	-		140	-	0,8	2			
		2	Cap for steel expansion joint (rectangular)		"	327	-		140	-	0,8	2			
		1	Cap for access door		"	327	-		140	1,0	-	2			
		1	horizontal duct (tapered from 1340 x 1340 to 800 x 800) at level approx. +45.400m		"	327	-		140	1,0	-	2			
		1	Measuring point	01 HHL 04 CP 001	"	-	-		-	-	-	-			
		5	Connections (d = 711) for OFA2 to front wall		"	327	-		-	-	-	-			
		5	horizontal duct (d = 711) for OFA2 to front wall at level approx. +47.500m		"	327	711		140	1,0	-	2			
		5	bends approx. 90° (d = 711)		"	327	711		140	1,0	-	2			
		5	dampers (round) at level approx. +47.500m	01 HHL 04 AA 003 - 007	"	327	711		140	1,0	-	2			
		10	Cap for steel expansion joints (round), (2 expansion joints per duct)		"	327	711		140	1,0	-	2			
		5	Transition piece from (d = 711) to (d = 500)		"	327	711		140	1,0	-	2			
		1	Measuring point	01 HHL 04 CT 502	"	-	-		-	-	-	-			



Specification for Heat- and Sound Insulation

Consortium Partner Document Code: 1.48120/00 770-7001

Project Doc. Number	MTZ/12/B/-----00770/ES/001
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Project Name:	Maritza East Power Station
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Remarks:	III. Air ducts
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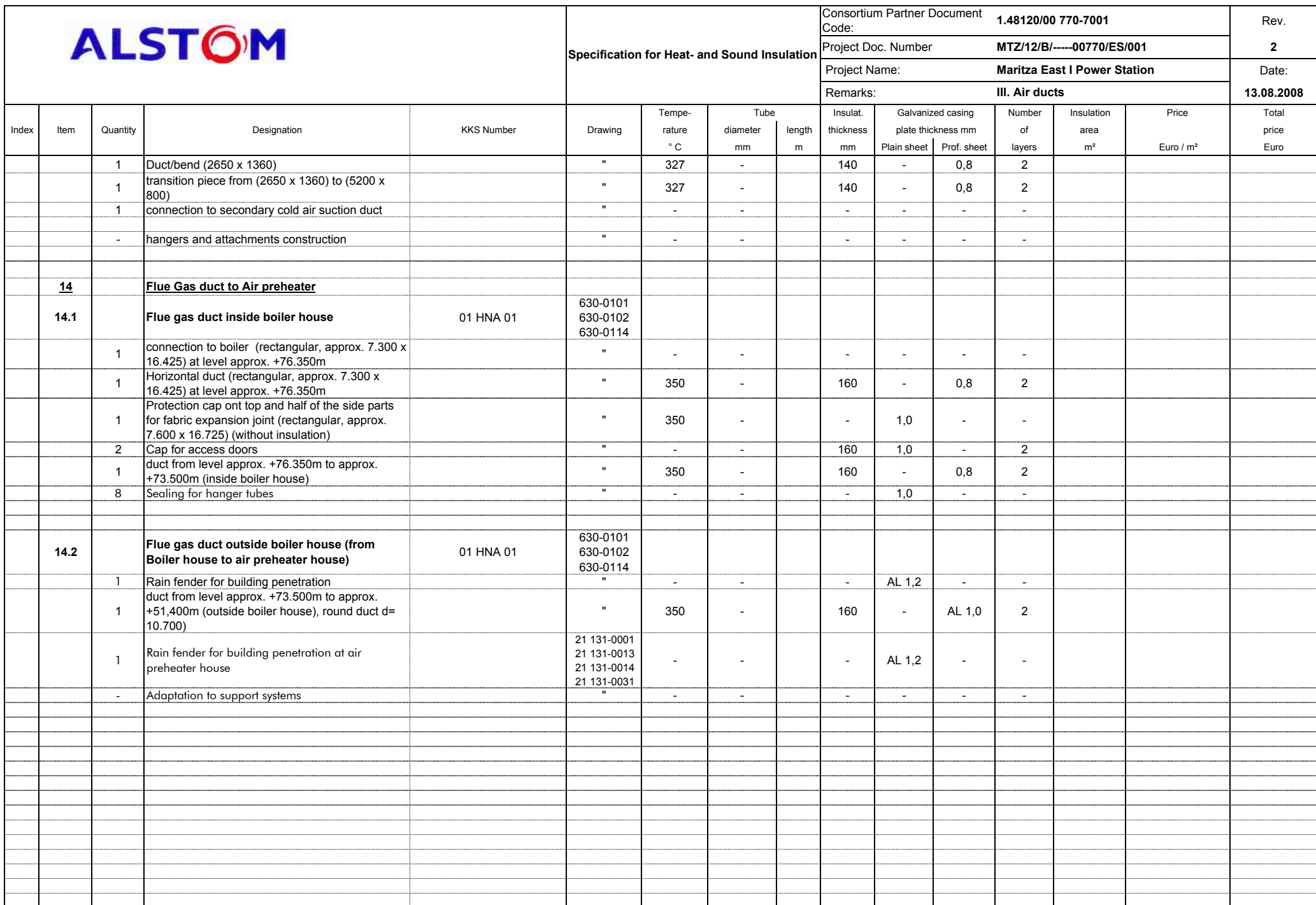
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Date:

13.08.2008

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Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		4	Caps for observation door 500x500		"	327	-		140	1,0	-	2			
		8	Shaft opening, approx. Diameter 1000, level approx. +0,9m												
	13		Hot air recirculation ducts												
	13.1		Duct to right line		620-0119 620-0120 620-0131										
		1	connection to duct from Air Preheater (d = 1800) at level approx. +36.900m		"	-	-		-	-	-	-			
		1	duct (d = 1800) from level approx. +36.900m to approx. 12,5m		"	327	1.800		140	1,0	-	2			
		4	Cap for steel expansion joint (round)		"	327	1.800		140	1,0	-	2			
		3	bends 90° (d = 1800)		"	327	1.800		140	1,0	-	2			
		1	damper (round), at level approx. +18.300m		"	327	1.800		140	1,0	-	2			
		5	Measuring point	01 HLA 40 CT 001, CP 501 - 504	"	-	-		-	-	-	-			
		1	Cap for access door		"	327	-		140	1,0	-	2			
		1	transition piece from round (d= 1800) to rectangular (2650 x 1360)		"	327	-		140	1,0	-	2			
		1	Duct (2650 x 1360)		"	327	-		140	-	0,8	2			
		1	transition piece/bend from (2650 x 1360) to (5200 x 800)		"	327	-		140	-	0,8	2			
		1	connection to secondary cold air suction duct		"	-	-		-	-	-	-			
		-	hangers and attachments construction		"	-	-		-	-	-	-			
	13.2		Duct to left line		"										
		1	connection to left distribution line (d = 1800) at level approx. +36.900m		"	-	-		-	-	-	-			
		1	vertical duct (d = 1800) from level approx. +36.900m to +12.500m		"	327	1.800		140	1,0	-	2			
		1	bends 90° (d = 1800)		"	327	1.800		140	1,0	-	2			
		1	damper (round), at level approx. +18.300m		"	327	1.800		140	1,0	-	2			
		5	Measuring point	01 HLA 50 CT 001, CP 501 - 504	"	-	-		-	-	-	-			
		1	Cap for access door		"	327	-		140	1,0	-	2			
		2	Cap for steel expansion joint (round), at level approx. +14.300m and 12.300m		"	327	1.800		140	1,0	-	2			
		1	transition piece from round (d= 1800) to rectangular (2650 x 1360)		"	327	-		140	1,0	-	2			





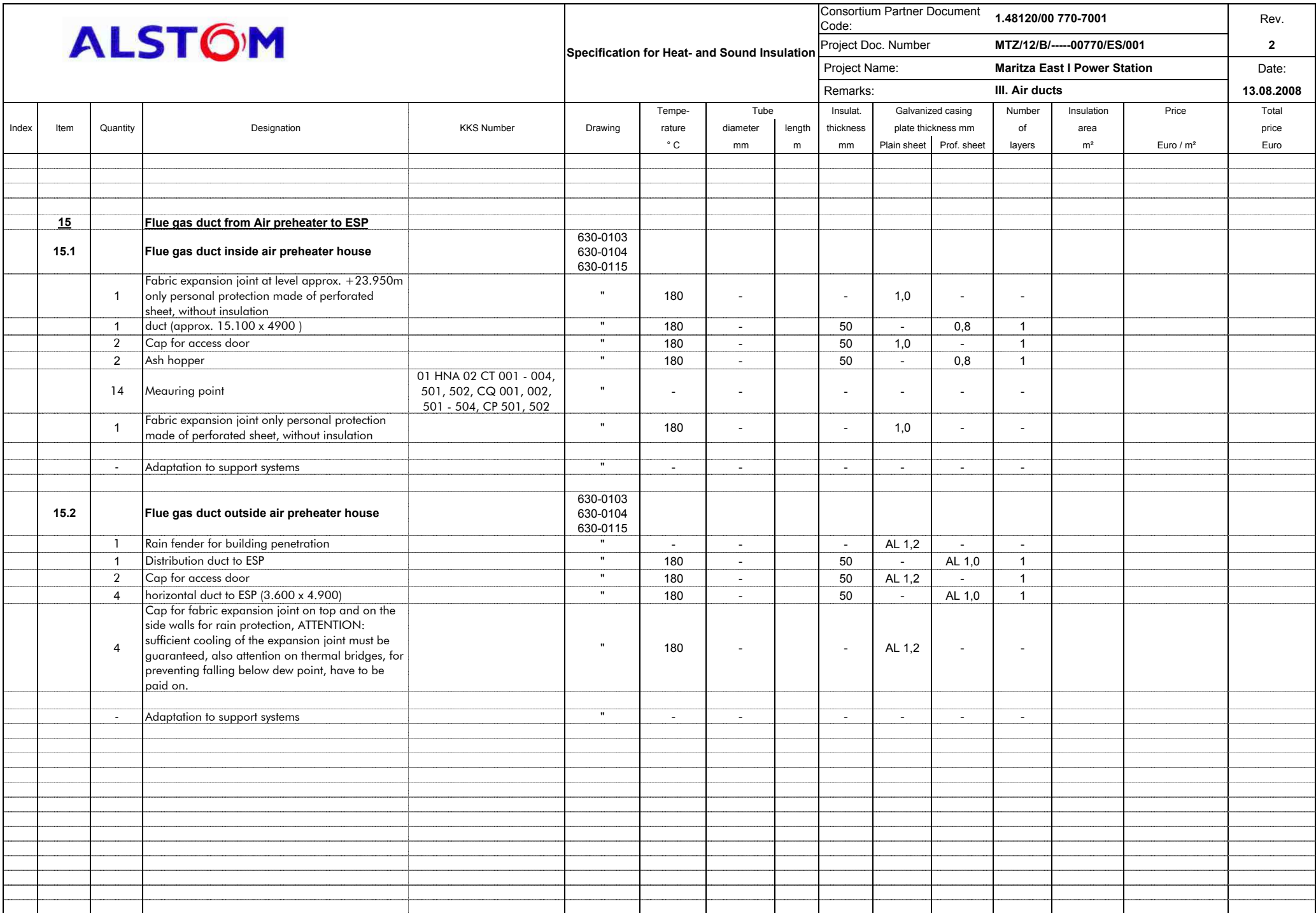
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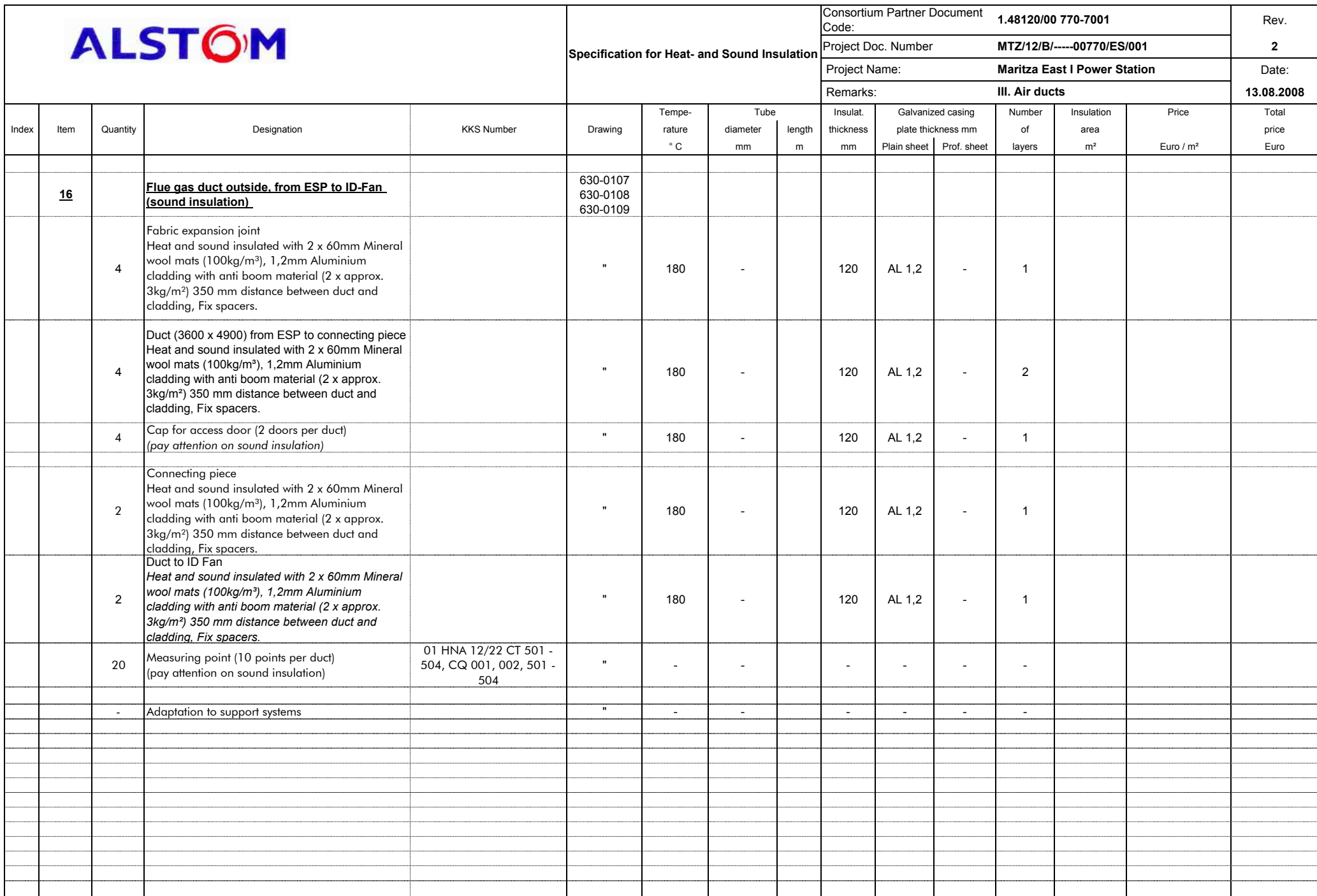
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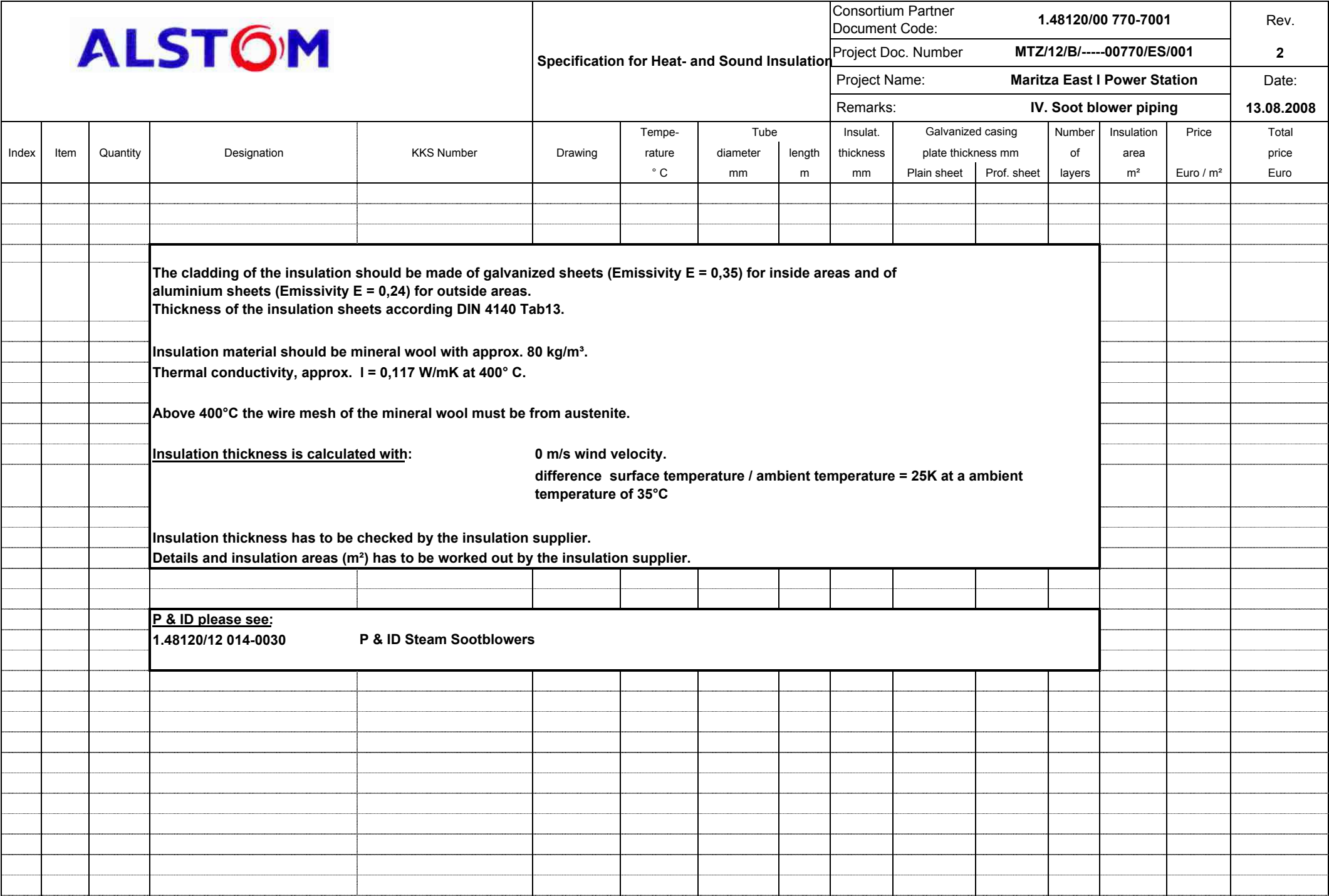
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Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
1	17	2	ID-Fan (outside) Heat and sound insulated with 2 x 120mm Mineral wool mats (100kg/m³), 1,2mm Aluminium cladding with anti boom material (2 x approx. 3kg/m²) 350 mm distance between duct and cladding, spacers with elastic links.		195-003	180	-		240	AL 1,2	-	2			
1		4	Fabric expansion joint Heat and sound insulated with 2 x 120mm Mineral wool mats (100kg/m³), 1,2mm Aluminium cladding with anti boom material (2 x approx. 3kg/m²) 350 mm distance between duct and cladding, spacers with elastic links.		"	180	-		240	AL 1,2	-	2			
	18		Flue gas duct outside, from ID-Fan to cooling tower.												
	18.1		Flue gas duct	01 HNA 13 01 HNA 23	630-0110 630-0111 630-0112										
		2	horizontal duct from ID-Fan to Silencer Heat and sound insulated with 2 x 60mm Mineral wool mats (100kg/m³), 1,2mm Aluminium cladding with anti boom material (2 x approx. 3kg/m²) 350 mm distance between duct and cladding, Fix spacers.		"	187	-		120	AL 1,2	-	1			
		2	Cap for access door (pay attention on sound insulation)		"	187	-		120	AL 1,2	-	1			
		2	Silencer from level approx. +7.500m to +12.500m Heat and sound insulated with 2 x 60mm Mineral wool mats (100kg/m³), 1,2mm Aluminium cladding with anti boom material (2 x approx. 3kg/m²) 350 mm distance between duct and cladding, Fix spacers.	01 HNA 13, 23 BS 001	"	187	-		120	AL 1,2	-	1			
		2	Duct from silencer to damper, approx. 12,500 to +14,000 m			187	-		120	AL 1,2	-	1			
		4	Measuring point (2 points per duct) (pay attention on sound insulation)	01 HNA 13, 23 CP 001, CT 001	"	-	-		-	-	-	-			
		2	Cap for access door (pay attention on sound insulation)		"	187	-		120	AL 1,2	-	1			
		2	Damper at level approx. +14.650m	01 HNA 13, 23 AA 001	"	187	-		120	AL 1,2	-	1			
		1	Duct, T-piece after damper to FDG from approx. +15,000 to 25,100 m		"	187	-		120	AL 1,2	-	1			
		2	Cap for access door		"	-	-		120	AL 1,2	-	1			
		1	Measuring point	01 HNA 30 CT 001	"	-	-		-	-	-	-			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	18.1	1	Cap for fabric expansion joint on top and on the side walls for rain protection, ATTENTION: sufficient cooling of the expansion joint must be guaranteed, also attention on thermal bridges, for preventing falling below dew point, have to be paid on.		630-0110 630-0111 630-0112	187	-		120	AL 1,2	-	1			
		-	Adaptation to support systems		"	-	-		-	-	-	-			
1	18.1		Sealing air for Dumper HNA13,23 AA001	01 HNW	630-0110 630-0111 630-0112 620-0145										
1		1	Air preheater at level approx. +16.895m	01 HNW 01 AH 001		140	-		60	AL 1,2	-	2			
1		1	Transition peace from rectangular to round			140									
1		1	Fabric expansion joint. Only rain protection			140			-	AL 1,2	-	-			
1		1	Duct (round) after air preheater			140	273		60	AL 1,2	-	2			
		1	Measuring point	01 HNW 01 CT 001	"	-	-		-	-	-	-			
1		2	Bend approx. 90°			140	273		60	AL 1,2	-	2			
1		1	Bend approx. 30°			140	273		60	AL 1,2	-	2			
1		2	Caps for steel expansion joints			140	273		60	AL 1,2	-	2			
1		1	T-Peace			140	273/323		60	AL 1,2	-	2			
1		2	Duct (round) to Flue gas damper			140	323		60	AL 1,2	-	2			
1		2	Fabric expansion joints. Only rain protection			140	323		-	AL 1,2	-	-			
1		2	Damper	01 HNW 13, 23 AA 001		140	323		60	AL 1,2	-	2			
		4	Measuring point		"	-	-		-	-	-	-			
1		2	Connection peace to Flue gas damper			140	323		60	AL 1,2	-	2			
		-	Adaptation to support systems		"	-	-		-	-	-	-			
	19		Flue gas duct for auxiliary boiler		630-0120 630-0121 630-0122										
		2	connection to auxiliary boiler		"	-	-		-	-	-	-			
1		2	duct (d = 1220) from level approx. +3.150m to roof		"	290	1.220		130	1,0	-	2			
1		4	Bend 90° (d = 1220) at level approx. +5.000m		"	290	1.220		130	1,0	-	2			
		2	Rain fender for roof penetration		"	-	-		-	Al 1,2	-	-			
1		2	Duct/bend (d =1220) outside building		"	290	1.220		130	Al 1,2	-	2			
III. Air Ducts, total:															



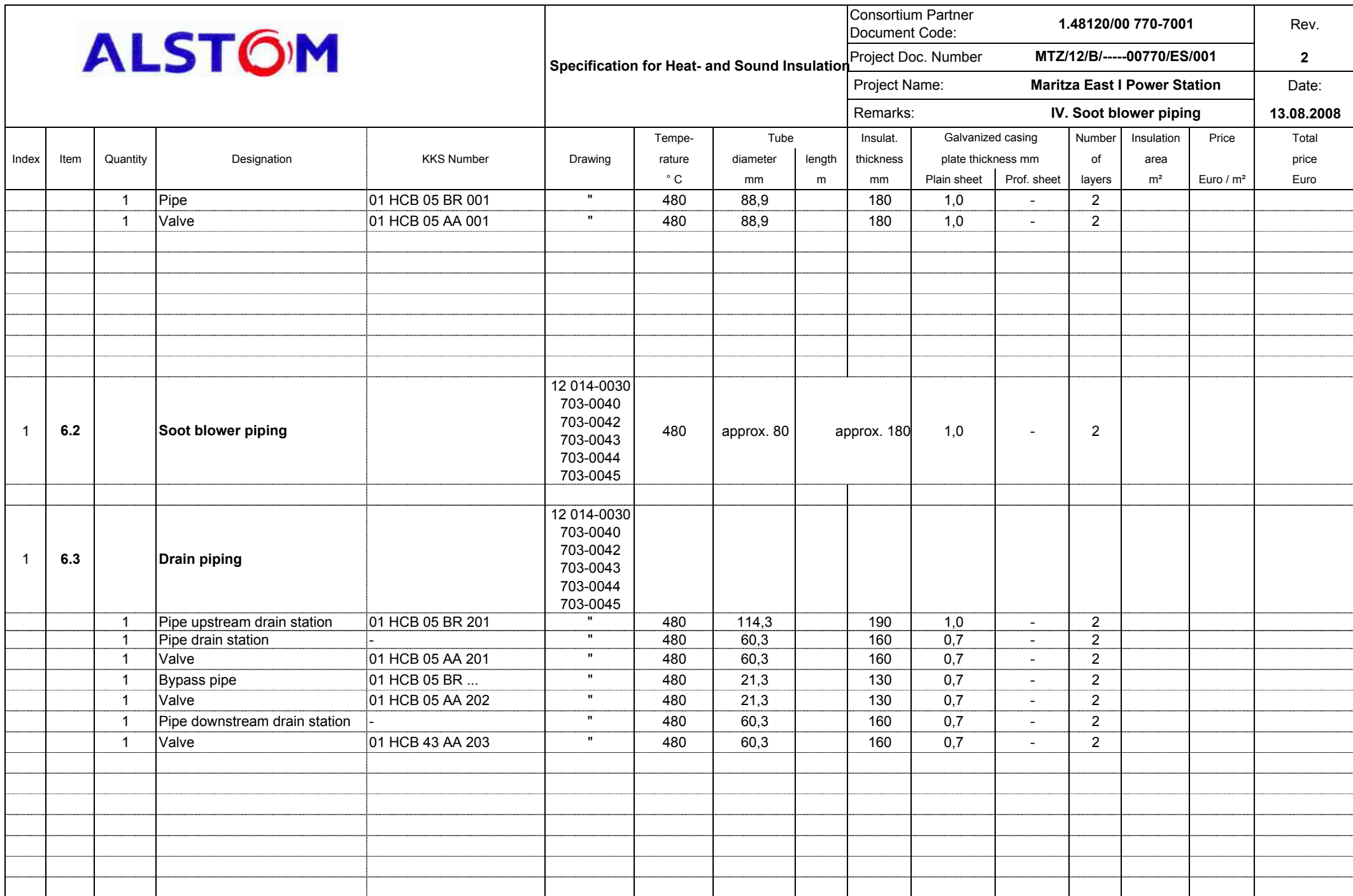
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
1	<u>1</u>		<u>Steam extraction</u>		12 014-0030 703-0040 703-0042 703-0043 703-0044 703-0045										
		1	Pipe	01 HCB 01 BR 001	"	480	88,9		180	1,0	-	2			
		1	Pipe	01 HCB 02 BR 001	"	480	88,9		180	1,0	-	2			
		1	Pipe	01 HCB 03 BR 001	"	480	139,7		200	1,0	-	2			
1	<u>2</u>		<u>Soot blower station</u>		12 014-0030 703-0040 703-0042 703-0043 703-0044 703-0045										
		2	Valve	01 HCB 03 AA 001, 002	"	480	139,7		200	1,0	-	2			
		1	Pipe	-	"	480	139,7		200	1,0	-	2			
		1	-	01 HCB 03 AT 001	"	480	-		200	1,0	-	2			
		1	Valve	01 HCB 03 AA 003	"	480	139,7		200	1,0	-	2			
		1	Pipe	01 HCB 03 BR 002	"	480	219,1		220	1,0	-	2			
		1	Drain pipe <i>Personal protection, approx only 3m after soot blower station, or up to the first valve.</i>	01 HCB 03 BR ...	"	480	21,3		130	0,7	-	2			
		1	Valve <i>Personal protection only.</i>	01 HCB 03 AA201	"	480	21,3		130	0,7	-	2			
		1	Measurement pipe for HCB03CP001- 003 <i>Personal protection, only to the 1st Valve or max. only 3m after soot blower station.</i>	01 HCB 03 BR ...	"	480	-		130	0,7	-	2			


Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
1	3		<u>Main distribution pipe</u>		12 014-0030 703-0040 703-0042 703-0043 703-0044 703-0045										
		1	Pipe	01 HCB 04 BR 001	"	480	139,7		200	1,0	-	2			
		1	Valve	01 HCB 04 AA 001	"	480	139,7		200	1,0	-	2			
	4		<u>Pipe to left side wall</u>												
1	4.1		Distribution piping		12 014-0030 703-0040 703-0042 703-0043 703-0044 703-0045										
		2	Pipe	01 HCB 21, 22 BR 001	"	480	114,3		190	1,0	-	2			
		4	Valve	01 HCB 21, 22 AA 001, 002											
		1	Pipe upstream drain station	01 HCB 23 BR 201	"	480	114,3		190	1,0	-	2			
		2	Funnel for measuring point	01 HCB 23 CT 201, 501	"	-	-		-	-	-	-			
		1	Pipe drain station	-	"	480	60,3		160	0,7	-	2			
		1	Valve	01 HCB 23 AA 201	"	480	60,3		160	0,7	-	2			
		1	Bypass pipe	01 HCB 23 BR ...	"	480	21,3		130	0,7	-	2			
		1	Valve	01 HCB 23 AA 202	"	480	21,3		130	0,7	-	2			
		1	Pipe downstream drain station	-	"	480	60,3		160	0,7	-	2			
		1	Valve	01 HCB 23 AA 203	"	480	60,3		160	0,7	-	2			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
1	4.2		Pipe to Soot blowers		12 014-0030 703-0040 703-0042 703-0043 703-0044 703-0045										
	<u>4.2.1</u>		<u>Piping to ECO2 Soot blowers</u> <u>+70.495</u>		"										
		4	Pipe	01 HCB 21 BR 061, 062 01 HCB 22 BR 063, 064	"	480	88,9		180	1,0	-	2			
	<u>4.2.2</u>		<u>Piping to RH1 Soot blowers</u> <u>+67.385</u>		"										
		1	Pipe	01 HCB 21 BR 051, 052 01 HCB 22 BR 053, 054	"	480	88,9		180	1,0	-	2			
	<u>4.2.3</u>		<u>Piping to SH2 Soot blowers</u> <u>+63.915</u>		"										
		1	Pipe	01 HCB 21 BR 041, 042 01 HCB 22 BR 043, 044	"	480	88,9		180	1,0	-	2			
	<u>4.2.4</u>		<u>Piping to RH2 Soot blowers</u> <u>+60.330</u>		"										
		1	Pipe	01 HCB 21 BR 031, 032 01 HCB 22 BR 033, 034	"	480	88,9		180	1,0	-	2			
	<u>4.2.5</u>		<u>Piping to SH3 Soot blowers</u> <u>+57.010</u>		"										
		1	Pipe	01 HCB 21 BR 021, 022 01 HCB 22 BR 023, 024	"	480	88,9		180	1,0	-	2			
	<u>4.2.6</u>		<u>Piping to SH1 Soot blowers</u> <u>+53.470</u>		"										

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	Pipe	01 HCB 21 BR 011, 012 01 HCB 22 BR 013, 014	"	480	88,9		180	1,0	-	2			
	5		Pipe to right side wall												
1	5.1		Distribution piping		12 014-0030 703-0040 703-0042 703-0043 703-0044 703-0045										
		2	Pipe	01 HCB 41, 42 BR 001	"	480	114,3		190	1,0	-	2			
		4	Valve	01 HCB 41, 42 AA 001, 002											
		1	Pipe upstream drain station	01 HCB 43 BR 201	"	480	114,3		190	1,0	-	2			
		2	Funnel for measuring point	01 HCB 43 CT 201, 501	"	-	-		-	-	-	-			
		1	Pipe drain station	-	"	480	60,3		160	0,7	-	2			
		1	Valve	01 HCB 43 AA 201	"	480	60,3		160	0,7	-	2			
		1	Bypass pipe	01 HCB 43 BR ...	"	480	21,3		130	0,7	-	2			
		1	Valve	01 HCB 43 AA 202	"	480	21,3		130	0,7	-	2			
		1	Pipe downstream drain station	-	"	480	60,3		160	0,7	-	2			
		1	Valve	01 HCB 43 AA 203	"	480	60,3		160	0,7	-	2			
1	5.2		Pipe to Soot blowers		12 014-0030 703-0040 703-0042 703-0043 703-0044 703-0045										
	<u>5.2.1</u>		<u>Piping to ECO2 Soot blowers +70.495</u>		"										
		1	Pipe	01 HCB 41 BR 061, 062 01 HCB 42 BR 063, 064	"	480	88,9		180	1,0	-	2			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	<u>5.2.2</u>		<u>Piping to RH1 Soot blowers</u> <u>+67.385</u>		"										
		1	Pipe	01 HCB 41 BR 051, 052 01 HCB 42 BR 053, 054	"	480	88,9		180	1,0	-	2			
1	<u>5.2.3</u>		<u>Piping to SH2 Soot blowers</u> <u>+63.915</u>		12 014-0030 703-0040 703-0042 703-0043 703-0044 703-0045										
		1	Pipe	01 HCB 41 BR 041, 042 01 HCB 42 BR 043, 044	"	480	88,9		180	1,0	-	2			
	<u>5.2.4</u>		<u>Piping to RH2 Soot blowers</u> <u>+60.330</u>		"										
		1	Pipe	01 HCB 41 BR 031, 032 01 HCB 42 BR 033, 034	"	480	88,9		180	1,0	-	2			
	<u>5.2.5</u>		<u>Piping to SH3 Soot blowers</u> <u>+57.010</u>		"										
		1	Pipe	01 HCB 41 BR 021, 022 01 HCB 42 BR 023, 024	"	480	88,9		180	1,0	-	2			
	<u>5.2.6</u>		<u>Piping to SH1 Soot blowers</u> <u>+53.470</u>		"										
		1	Pipe	01 HCB 41 BR 011, 012 01 HCB 42 BR 013, 014	"	480	88,9		180	1,0	-	2			
	<u>6</u>		<u>Soot blower piping for air</u> <u>preheater</u>												
1	<u>6.1</u>		<u>Piping to Air preheater</u>		12 014-0030 703-0040 703-0042 703-0043 703-0044 703-0045										



					Specification for Heat- and Sound Insulation				Consortium Partner Document Code: 1.48120/00 770-7001					Rev.	
									Project Doc. Number MTZ/12/B/-----00770/ES/001					2	
									Project Name: Maritza East I Power Station					Date:	
									Remarks: IV. Soot blower piping					13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Tempe- rature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet Prof. sheet		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
IV. Soot blower Piping, total:															

Dr. T190e - 10.1999

Jr. T190e - 10.1999



Rev.

2

Date:

13.08.2008

The cladding of the insulation should be made of galvanized sheets (Emissivity $E = 0,35$) for inside areas and of aluminium sheets (Emissivity $E = 0,24$) for outside areas.
Thickness of the insulation sheets according DIN 4140 Tab13.

Insulation material should be mineral wool with approx. 80 kg/m³.
Thermal conductivity, approx. $\lambda = 0,117 \text{ W/mK}$ at 400° C.

Above 400°C the wire mesh of the mineral wool must be from austenite.

Insulation thickness is calculated with:

0 m/s wind velocity.

difference surface temperature / ambient temperature = 25K at a ambient temperature of 35°C

Insulation thickness has to be checked by the insulation supplier.

Details and insulation areas (m²) has to be worked out by the insulation supplier.

P & ID please see:

1.48120/12 014-0023

P & ID Coal Burner 1



Rev.

2

Date:

13.08.2008

ALSTOM Power Boiler GmbH



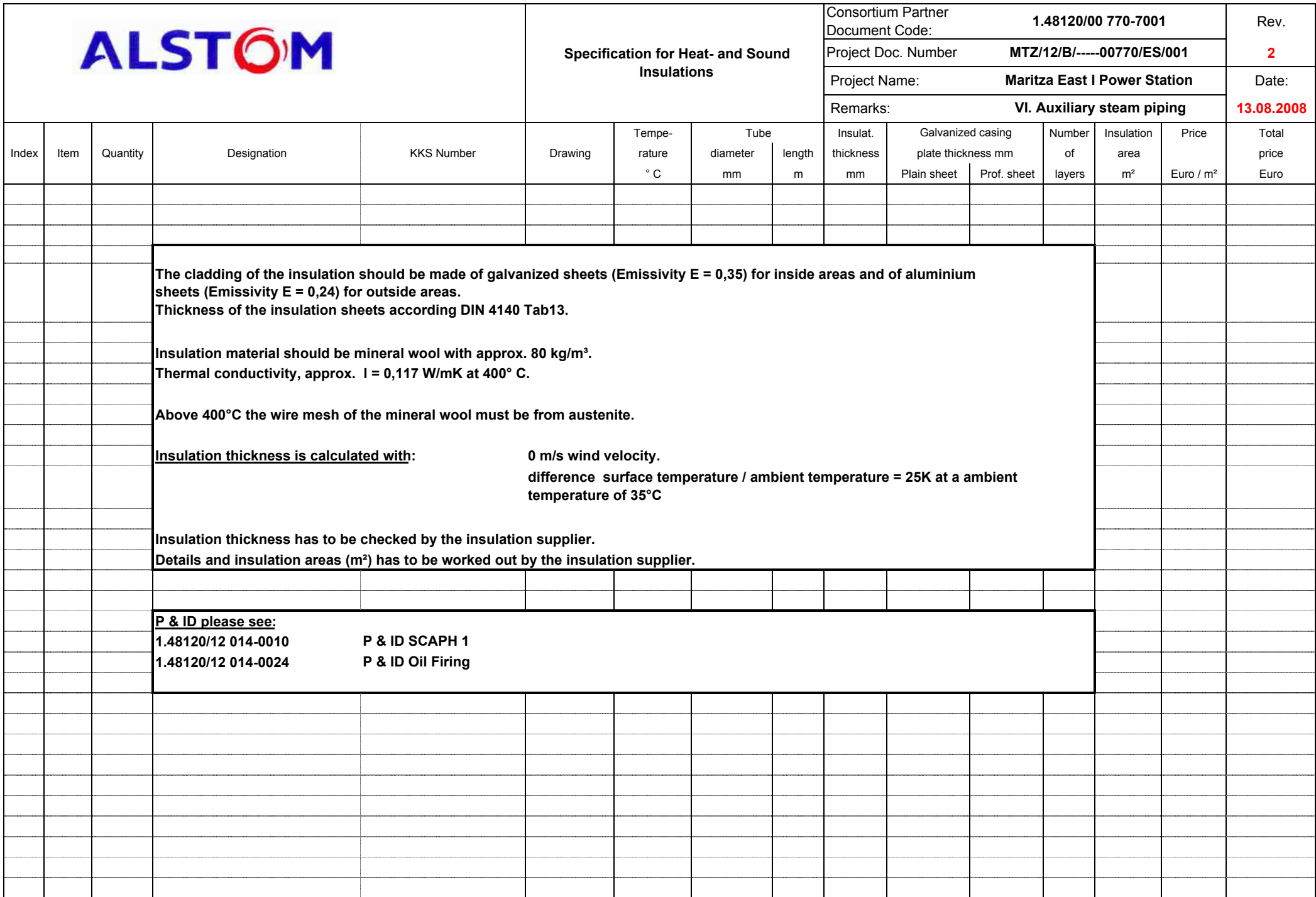
Rev.

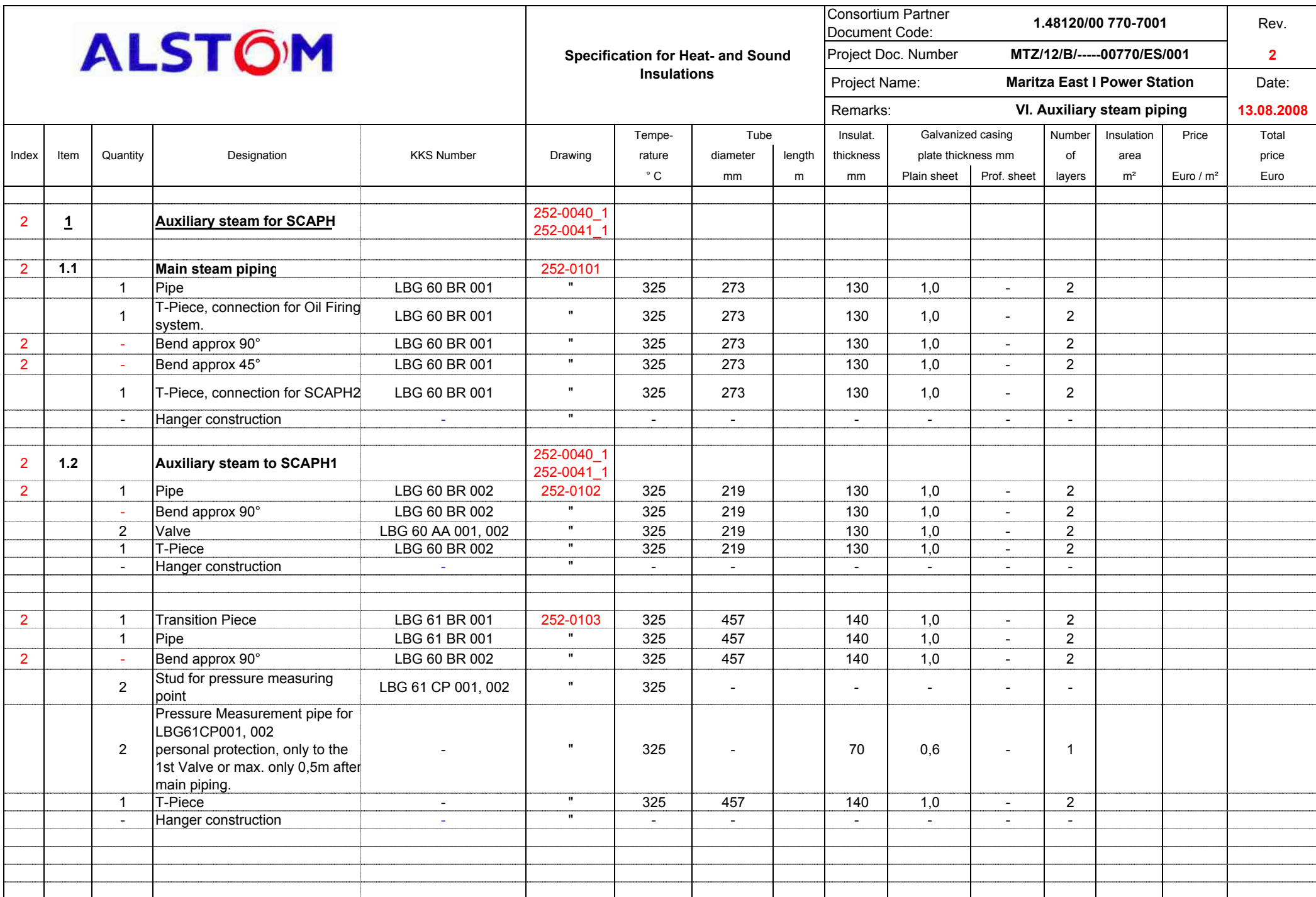
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Date:

13.08.2008

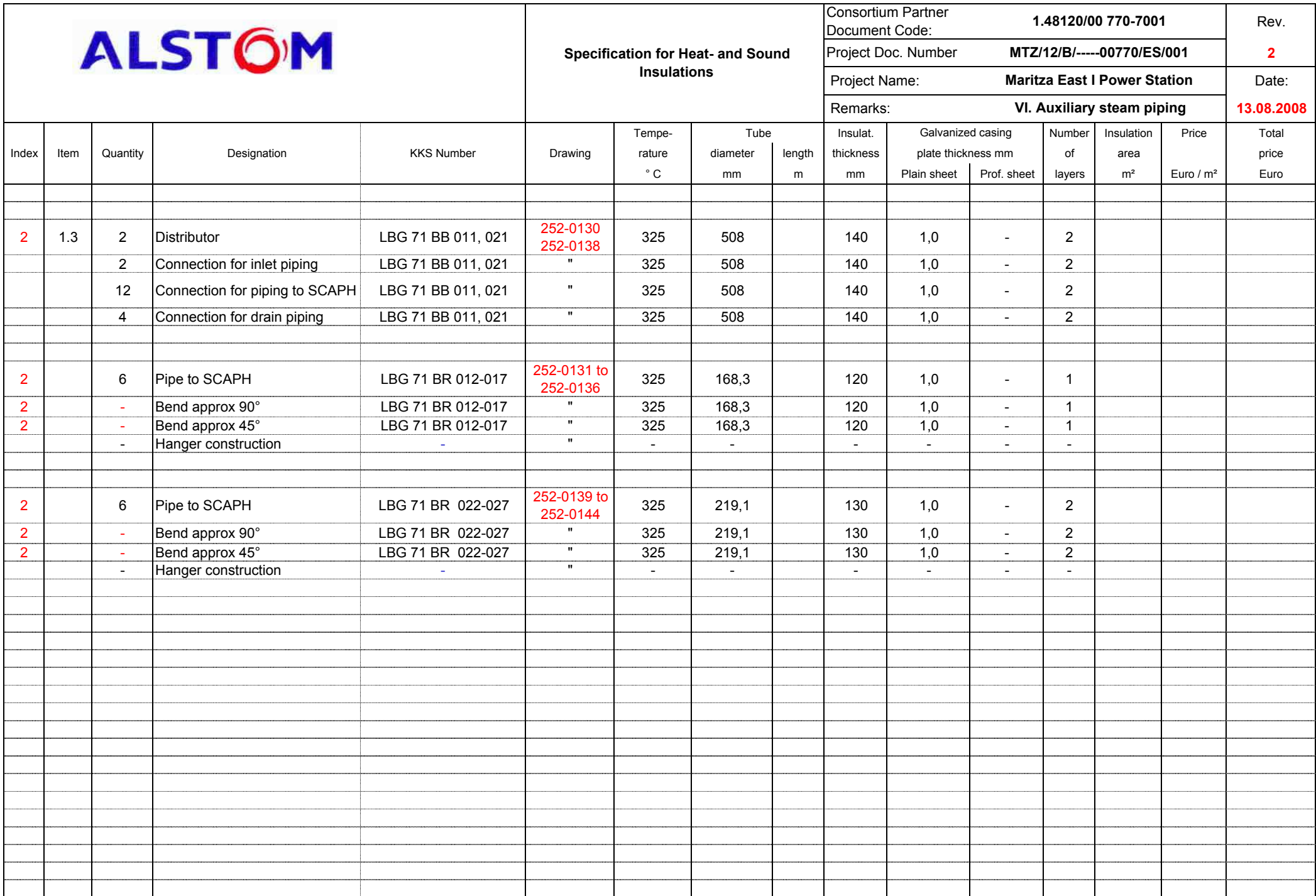
Jr. T190e - 10.1999





Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
										Plain sheet	Prof. sheet			
2	1.2	1	Transition Piece	LBG 61 BR 010	252-0104	325	457		140	1,0	-	2		
		1	Pipe to SCAPH	LBG 61 BR 010	"	325	273		130	1,0	-	2		
2		-	Bend approx 90°	LBG 61 BR 010	"	325	273		130	1,0	-	2		
		1	Valve	LBG 61 AA 001	"	325	273		130	1,0	-	2		
		-	Hanger construction	-	"	-	-		-	-	-	-		
2		1	Transition Piece	LBG 61 BR 020	252-0112	325	457		140	1,0	-	2		
		1	Pipe to SCAPH	LBG 61 BR 020	"	325	355,6		140	1,0	-	2		
2		-	Bend approx 90°	LBG 61 BR 020	"	325	355,6		140	1,0	-	2		
		1	Valve	LBG 61 AA 002	"	325	355,6		140	1,0	-	2		
		-	Hanger construction	-	"	-	-		-	-	-	-		
2		2	Distributor	LBG 61 BB 011, 021	252-0105 252-0113	325	508		140	1,0	-	2		
		2	Connection for inlet piping	LBG 61 BB 011, 021	"	325	508		140	1,0	-	2		
		12	Connection for piping to SCAPH	LBG 61 BB 011, 021	"	325	508		140	1,0	-	2		
		4	Connection for drain piping	LBG 61 BB 011, 021	"	325	508		140	1,0	-	2		
2		6	Pipe to SCAPH	LBG 61 BR 012-017	252-0106 to 252-0111	325	168,3		120	1,0	-	1		
2		-	Bend approx 90°	LBG 61 BR 012-017	"	325	168,3		120	1,0	-	1		
2		-	Bend approx 45°	LBG 61 BR 012-017	"	325	168,3		120	1,0	-	1		
		-	Hanger construction	-	"	-	-		-	-	-	-		
2		6	Pipe to SCAPH	LBG 61 BR 022-027	252-0114 to 252-0119	325	219,1		130	1,0	-	2		
2		-	Bend approx 90°	LBG 61 BR 022-027	"	325	219,1		130	1,0	-	2		
2		-	Bend approx 45°	LBG 61 BR 022-027	"	325	219,1		130	1,0	-	2		
		-	Hanger construction	-	"	-	-		-	-	-	-		

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2	1.3		Auxiliary steam to SCAPH2		252-0040_1 252-0041_1									
2		1	Pipe	LBG 70 BR 002	252-0127	325	219		130	1,0	-	2		
2		-	Bend approx 90°	LBG 70 BR 002	"	325	219		130	1,0	-	2		
		2	Valve	LBG 70 AA 001, 002	"	325	219		130	1,0	-	2		
		1	T-Piece	LBG 70 BR 002	"	325	219		130	1,0	-	2		
		-	Hanger construction	-	"	-	-		-	-	-	-		
2		1	Transition Piece	LBG 71 BR 001	252-0128	325	457		140	1,0	-	2		
		1	Pipe	LBG 71 BR 001	"	325	457		140	1,0	-	2		
2		-	Bend approx 90°	LBG 70 BR 002	"	325	457		140	1,0	-	2		
		2	Stud for pressure measuring point	LBG 71 CP 001, 002	"	325	-		-	-	-	-		
		2	Pressure Measurement pipe for LBG71CP001, 002 personal protection, only to the 1st Valve or max. only 0,5m after main piping.	-	"	325	-		70	0,6	-	1		
		1	T-Piece	-	"	325	457		140	1,0	-	2		
		-	Hanger construction	-	"	-	-		-	-	-	-		
2		1	Transition Piece	LBG 71 BR 010	252-0129	325	457		140	1,0	-	2		
		1	Pipe to SCAPH	LBG 71 BR 010	"	325	273		130	1,0	-	2		
2		-	Bend approx 90°	LBG 71 BR 010	"	325	273		130	1,0	-	2		
		1	Valve	LBG 71 AA 001	"	325	273		130	1,0	-	2		
		-	Hanger construction	-	"	-	-		-	-	-	-		
2		1	Transition Piece	LBG 71 BR 020	252-0137	325	457		140	1,0	-	2		
		1	Pipe to SCAPH	LBG 71 BR 020	"	325	355,6		140	1,0	-	2		
2		-	Bend approx 90°	LBG 71 BR 020	"	325	355,6		140	1,0	-	2		
2		-	Bend approx 45°	LBG 71 BR 020	"	325	355,6		140	1,0	-	2		
		1	Valve	LBG 71 AA 002	"	325	355,6		140	1,0	-	2		
		-	Hanger construction	-	"	-	-		-	-	-	-		



Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2	1.4		Piping after SCAPH1		252-0040_1 252-0041_1									
2	1.4.1		<u>From SCAPH to condensate tank</u>		252-0120 252-0121									
		4	Pipe after SCAPH	LCN 10 BR 010, 020		212	114,3		70	0,7	-	1		
2		-	Bend approx 45°	LCN 10 BR 010, 020	"	212	114,3		70	0,7	-	1		
2		-	Bend approx 90°	LCN 10 BR 010, 020	"	212	114,3		70	0,7	-	1		
		2	T- Piece	LCN 10 BR 010, 020	"	212	114,3		70	0,7	-	1		
2		2	Pipe after SCAPH	LCN 10 BR 010, 020	"	212	114,3		70	0,7	-	1		
		-	Bend approx 90°	LCN 10 BR 010, 020	"	212	114,3		70	0,7	-	1		
		2	Temperatur measuring points	LCN 10 CT 001, 002	"	-	-		-	-	-	-		
		2	Valve	LCN 10 AA 001, 002	"	212	114,3		70	0,7	-	1		
		-	Hanger construction	-	"	-	-		-	-	-	-		
2	1.4.2		<u>From SCAPH Distributor to condensate tank</u>		252-0040_1 252-0041_1									
		4	Pipe after distributor	LCN 10 BR 201, 202	"	212	DN 50		approx. 70	0,7	-	1		
		-	Bend	LCN 10 BR 201, 202	"	212	DN 50		approx. 70	0,7	-	1		
		2	T- Piece	LCN 10 BR 201, 202	"	212	DN 50		approx. 70	0,7	-	1		
2			Pipe after T-Piece	LCN 10 BR 201, 202	"	212	DN 50		approx. 70	0,7	-	1		
		-	Bend	LCN 10 BR 201, 202	"	212	DN 50		approx. 70	0,7	-	1		
		2	Valve	LCN 10 AA 201, 202	"	212	DN 50		approx. 70	0,7	-	1		
		1	T- Piece	LCN 10 BR 210	"	212	DN 50		approx. 70	0,7	-	1		
		1	Pipe to condensate tank	LCN 10 BR 210	"	212	DN 50		approx. 70	0,7	-	1		
		-	Bend		"	212	DN 50		approx. 70	0,7	-	1		
		-	Hanger construction	-	"	-	-		-	-	-	-		

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2	1.4.3		Condensate tank		252-0040_1 252-0041_1									
2		1	Condensate tank	LCN 10 BB 001	"	212	approx. 1000		approx. 80	1,0	-	1		
		1	Stud for pressure measuring point	LCN 10 CP 001	"	212	-		-	-	-	-		
		1	Pressure Measurement pipe for LCN10CP001 personal protection, only to the 1st Valve or max. only 0,5m after main piping.	-	"	212	-		40	0,5	-	1		
		2	Stud for level measuring point	LCN 10 CL 001, 002	"	212	-		-	-	-	-		
		2	Pressure Measurement pipe for LCN10CL001, 002 personal protection, only to the 1st Valve or max. only 0,5m after main piping.	-	"	212	-		40	0,5	-	1		
	1.4.3		After condensate tank											
2		1	Pipe to condensate pump	LCN 10 BR 030	252-0122	212	88,9		60	0,6	-	1		
2		-	Pipe bends	LCN 10 BR 030	"	212	88,9		60	0,6	-	1		
		1	Temperatur measuring point	LCN 10 CT 003	-	-	-		-	-	-	-		
		1	T-Piece for pipe connection	LCN 10 BR 030	"	212	88,9		60	0,6	-	1		
		1	T-Piece for drain connection	LCN 10 BR 030	"	212	88,9		60	0,6	-	1		
		1	Valve	LCN 10 AA 003	"	212	88,9		60	0,6	-	1		
		1	Stud for pressure measuring point	LCN 10 CP 002	"	212	-		-	-	-	-		
		1	Pressure Measurement pipe for LCN10CP002 personal protection, only to the 1st Valve or max. only 0,5m after main piping.	-	"	212	-		40	0,5	-	1		
		-	Hanger construction	-	"	-	-		-	-	-	-		
1		1	Drain pipe personal protection, only to the 1st Valve or max. only 3m after main piping.	LCN 10 BR 220	"	212	DN40		40	0,5	-	1		

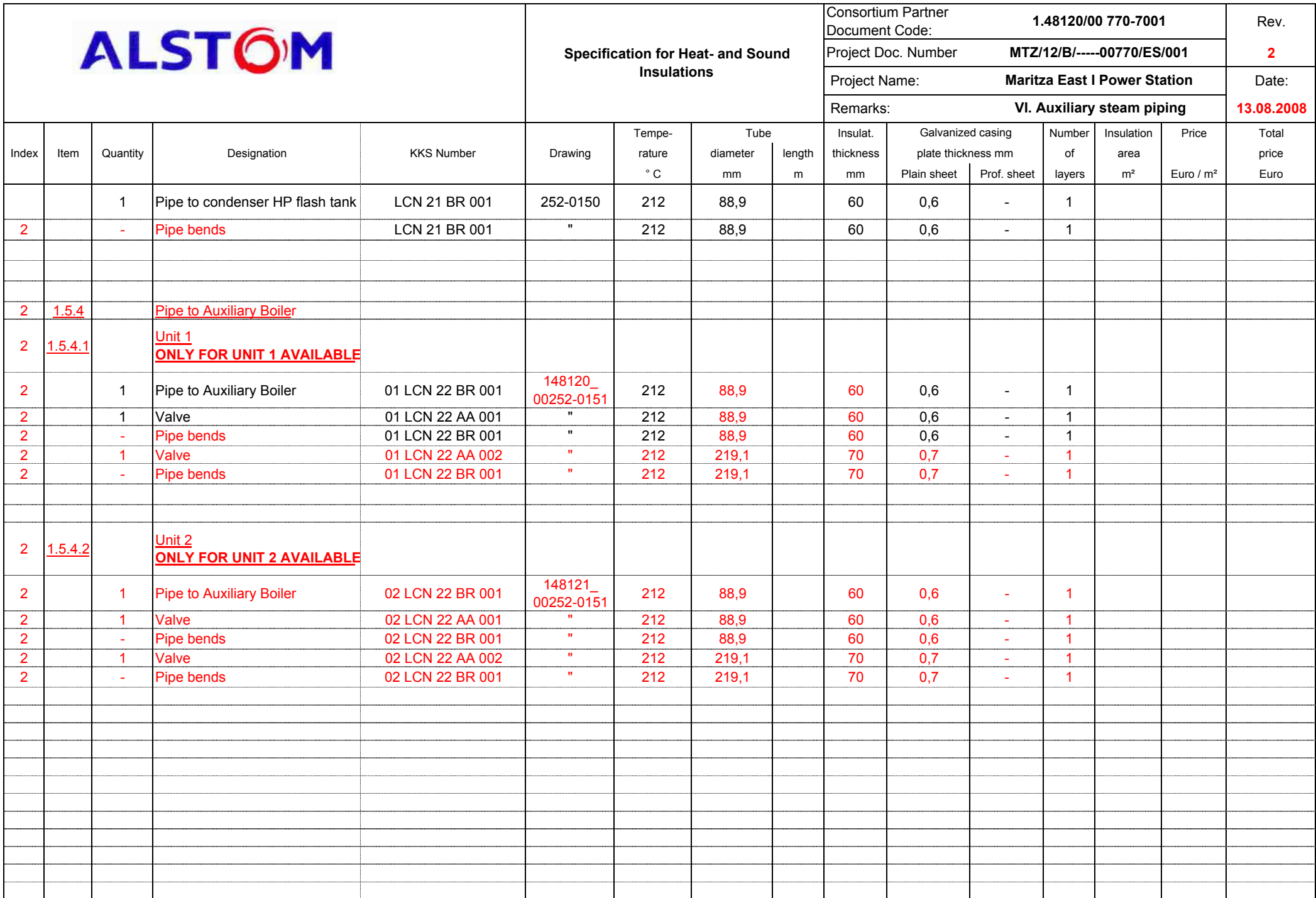
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2	1.4.3	1	Condensate pump	LCN 10 AP 001	252-0040 252-0041	212	-		70	0,8	-	1		
2		1	Pipe downstream condensate pump	LCN 10 BR 031	252-0123	212	88,9		60	0,6	-	1		
2		-	Pipe bends	LCN 10 BR 031	"	212	88,9		60	0,6	-	1		
		1	Valve	LCN 10 AA 004	"	212	88,9		60	0,6	-	1		
		2	Stud for measuring point	LCN 10 CP 003, CQ 001	"	212	-		-	-	-	-		
		2	Measurement pipe for LCN10CP003, CQ001 personal protection, only to the 1st Valve or max. only 0,5m after main piping.	-	"	212	-		40	0,5	-	1		
		1	T-Piece for drain connection	LCN 10 BR 031	"	212	88,9		60	0,6	-	1		
		4	T-Piece for pipe connection	LCN 10 BR 031	"	212	88,9		60	0,6	-	1		
		1	Valve	LCN 10 AA 007	"	212	88,9		60	0,6	-	1		
		1	Valve	LCN 10 AA 008	"	212	219,1		70	0,7	-	1		
2		1	Pipe to Flash Tank (IBD)	LCN 10 BR 031	"	212	219,1		70	0,7	-	1		
2		-	Pipe bends	LCN 10 BR 031	"	212	219,1		70	0,7	-	1		
		-	Hanger construction	-	"	-	-		-	-	-	-		
2		1	Pipe	LCN 10 BR 033	252-0124	212	88,9		60	0,6	-	1		
		1	Valve	LCN 10 AA 005	"	212	88,9		60	0,6	-	1		
2		-	Bend approx 90°	LCN 10 BR 033	"	212	88,9		60	0,6	-	1		
		-	Hanger construction	-	"	-	-		-	-	-	-		
2		1	Pipe	LCN 10 BR 032	252-0040 252-0041	212	DN 50		approx. 60	0,6	-	1		
		1	Valve	LCN 10 AA 006	"	212	DN 50		approx. 60	0,6	-	1		
		-	Bend	LCN 10 BR 032	"	212	DN 50		approx. 60	0,6	-	1		
		-	Hanger construction	-	"	-	-		-	-	-	-		
2		1	Pipe to condenser HP flash tank	LCN 11 BR 001	252-0125	212	88,9		60	0,6	-	1		
2		-	Pipe bends	LCN 11 BR 001	"	212	88,9		60	0,6	-	1		

<div>ALSTOM</div>					Specification for Heat- and Sound Insulations				Consortium Partner					Rev.	
									Document Code: 1.48120/00 770-7001						
									Project Doc. Number MTZ/12/B/-----00770/ES/001						
									Project Name: Maritza East I Power Station						
					Remarks: VI. Auxiliary steam piping					Date: 13.08.2008					
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
										Plain sheet	Prof. sheet				
2	1.4.4		Pipe to Auxiliary Boiler												
2	1.4.4.1		Unit 1 ONLY FOR UNIT 1 AVAILABLE												
2		1	Pipe to Auxiliary Boiler	01 LCN 12 BR 001	148120_00252-0126	212	88,9		60	0,6	-	1			
2		1	Valve	01 LCN 12 AA 001	"	212	88,9		60	0,6	-	1			
2	-		Pipe bends	01 LCN 12 BR 001	"	212	88,9		60	0,6	-	1			
2	1		Valve	01 LCN 12 AA 002	"	212	219,1		70	0,7	-	1			
2	-		Pipe bends	01 LCN 12 BR 001	"	212	219,1		70	0,7	-	1			
2		1	Transition Piece 219.1 / 273	09 LCN 30 BR 001	00252-0163	212	273		70	0,7	-	1			
2		1	Pipe	09 LCN 30 BR 001	"	212	273		70	0,7	-	1			
2		-	Bend	09 LCN 30 BR 001	"	212	273		70	0,7	-	1			
2	1.4.4.2		Unit 2 ONLY FOR UNIT 2 AVAILABLE												
2		1	Pipe to Auxiliary Boiler	02 LCN 12 BR 001	148121_00252-0126	212	88,9		60	0,6	-	1			
2		1	Valve	02 LCN 12 AA 001	"	212	88,9		60	0,6	-	1			
2	-		Pipe bends	02 LCN 12 BR 001	"	212	88,9		60	0,6	-	1			
2	1		Valve	02 LCN 12 AA 002	"	212	219,1		70	0,7	-	1			
2	-		Pipe bends	02 LCN 12 BR 001	"	212	219,1		70	0,7	-	1			

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2	1.5		Piping after SCAPH2		252-0040_01 252-0041_01									
2	1.5.1		<u>From SCAPH to condensate tank</u>		252-0145 252-0146									
		4	Pipe after SCAPH	LCN 20 BR 010, 020	"	212	114,3		70	0,7	-	1		
2		-	Bend approx 45°	LCN 20 BR 010, 020	"	212	114,3		70	0,7	-	1		
2		-	Bend approx 90°	LCN 20 BR 010, 020	"	212	114,3		70	0,7	-	1		
		2	T- Piece	LCN 20 BR 010, 020	"	212	114,3		70	0,7	-	1		
		2	Pipe after SCAPH	LCN 20 BR 010, 020	"	212	114,3		70	0,7	-	1		
2		-	Bend approx 90°	LCN 20 BR 010, 020	"	212	114,3		70	0,7	-	1		
		2	Temperatur measuring points	LCN 20 CT 001, 002	"	-	-		-	-	-	-		
		2	Valve	LCN 20 AA 001, 002	"	212	114,3		70	0,7	-	1		
		-	Hanger construction	-	"	-	-		-	-	-	-		
2	1.5.2		<u>From SCAPH Distributor to condensate tank</u>		252-0040_1 252-0041_1									
2		4	Pipe after distributor	LCN 20 BR 201, 202	"	212	DN 50		approx. 70	0,7	-	1		
2		-	Bend	LCN 20 BR 201, 202	"	212	DN 50		approx. 70	0,7	-	1		
2		2	T- Piece	LCN 20 BR 201, 202	"	212	DN 50		approx. 70	0,7	-	1		
2		4	Pipe after T-Piece	LCN 20 BR 201, 202	"	212	DN 50		approx. 70	0,7	-	1		
2		-	Bend	LCN 20 BR 201, 202	"	212	DN 50		approx. 70	0,7	-	1		
2		2	Valve	LCN 20 AA 201, 202	"	212	DN 50		approx. 70	0,7	-	1		
2		1	T- Piece	LCN 20 BR 210	"	212	DN 50		approx. 70	0,7	-	1		
2		1	Pipe to condensate tank	LCN 20 BR 210	"	212	DN 50		approx. 70	0,7	-	1		
2		-	Bend		"	212	DN 50		approx. 70	0,7	-	1		
		-	Hanger construction	-	"	-	-		-	-	-	-		


Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2	1.5.3		Condensate tank		252-0040_1 252-0041_1									
2		1	Condensate tank	LCN 20 BB 001	"	212	approx. 1000		approx. 80	1,0	-	1		
		1	Stud for pressure measuring point	LCN 20 CP 001	"	212	-		-	-	-	-		
		1	Pressure Measurement pipe for LCN10CP001 personal protection, only to the 1st Valve or max. only 0,5m after main piping.	-	"	212	-		40	0,5	-	1		
		2	Stud for level measuring point	LCN 20 CL 001, 002	"	212	-		-	-	-	-		
		2	Pressure Measurement pipe for LCN10CL001, 002 personal protection, only to the 1st Valve or max. only 0,5m after main piping.	-	"	212	-		40	0,5	-	1		
2	1.5.3		After condensate tank		252-0147									
		1	Pipe to condensate pump	LCN 20 BR 030	"	212	88,9		60	0,6	-	1		
2		-	Bend bends	LCN 20 BR 030	"	212	88,9		60	0,6	-	1		
		1	Temperatur measuring point	LCN 20 CT 003	-	-	-		-	-	-	-		
		1	T-Piece for pipe connection	LCN 20 BR 030	"	212	88,9		60	0,6	-	1		
		1	T-Piece for drain connection	LCN 20 BR 030	"	212	88,9		60	0,6	-	1		
		1	Valve	LCN 20 AA 003	"	212	88,9		60	0,6	-	1		
		1	Stud for pressure measuring point	LCN 20 CP 002	"	212	-		-	-	-	-		
		1	Pressure Measurement pipe for LCN20CP002 personal protection, only to the 1st Valve or max. only 0,5m after main piping.	-	"	212	-		40	0,5	-	1		
		-	Hanger construction	-	"	-	-		-	-	-	-		

Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
		1	Drain pipe personal protection, only to the 1st Valve or max. only 3m after main piping.	LCN 20 BR 220	"	212	-		40	0,5	-	1		
2		1	Condensate pump	LCN 20 AP 001	252-0040 252-0041	212	-		70	0,8	-	1		
2		1	Pipe downstream condensate pump	LCN 20 BR 031	252-0148	212	88,9		60	0,6	-	1		
2		-	Pipe bends	LCN 20 BR 031	"	212	88,9		60	0,6	-	1		
		1	Valve	LCN 20 AA 004	"	212	88,9		60	0,6	-	1		
		2	Stud for measuring point	LCN 20 CP 003, CQ 001	"	212	-		-	-	-	-		
		2	Measurement pipe for LCN20CP003, CQ001 personal protection, only to the 1st Valve or max. only 0,5m after main piping.	-	"	212	-		40	0,5	-	1		
		1	T-Piece for drain connection	LCN 20 BR 031	"	212	88,9		60	0,6	-	1		
		4	T-Piece for pipe connection	LCN 20 BR 031	"	212	88,9		60	0,6	-	1		
		1	Valve	LCN 20 AA 007	"	212	88,9		60	0,6	-	1		
		1	Valve	LCN 20 AA 008	"	212	219,1		70	0,7	-	1		
2		1	Pipe to Flash Tank (IBD)	LCN 20 BR 031	"	212	219,1		70	0,7	-	1		
2		2	Pipe bends	LCN 20 BR 031	"	212	219,1		70	0,7	-	1		
		-	Hanger construction	-	"	-	-		-	-	-	-		
2		1	Pipe	LCN 20 BR 033	252-0149	212	88,9		60	0,6	-	1		
		1	Valve	LCN 20 AA 005	"	212	88,9		60	0,6	-	1		
2		-	Bend approx 90°	LCN 20 BR 033	"	212	88,9		60	0,6	-	1		
		-	Hanger construction	-	"	-	-		-	-	-	-		
2		1	Pipe	LCN 20 BR 032	252-0040 252-0041	212	DN 50		approx. 60	0,6	-	1		
2		1	Valve	LCN 20 AA 006	"	212	DN 50		approx. 60	0,6	-	1		
2		-	Bend	LCN 20 BR 032	"	212	DN 50		approx. 60	0,6	-	1		
		-	Hanger construction	-	"	-	-		-	-	-	-		




Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	2		Auxiliary steam for Oil Firing											
	2.1		Main steam piping		513-0015									
		1	Connection to LBG60	-	"	-	-		-	-	-	-		
		1	Valve	01 LBG 65 AA 001	"	307								
		1	Main Steam pipe	01 LBG 65 BR 001	"	307								
		1	Main Steam pipe to ring main	01 HJM 01 BR 001	"	307	60,3		90	0,6	-	1		
		-	Pipe bends	"	"	307	60,3		90	0,6	-	1		
		1	Ring main	01 HJM 01 BR 001	"	307	60,3		90	0,6	-	1		
		-	Pipe bends	"	"	307	60,3		90	0,6	-	1		
		4	T-Piece for pipe connection to Oil burner	"	"	307	-		90	0,6	-	1		
1		1	Drain pipe personal protection, only to the 1st Valve or max. only 3m after main piping.		"	307	DN25		80	0,6	-	1		
		4	T-Piece for Measurement pipe		"	307	-		80	0,6	-	1		
		4	Pressure Measurement pipe for HJM01CP301, 302, 303, 504 personal protection, only to the 1st Valve or max. only 0,5m after main piping.		"	307	-		80	0,6	-	1		
	2.2		Auxiliary steam to Oil burner 1		513-0015									
		1	Pipe	01 HJM 10 BR 001	"	307	33,7		80	0,6	-	1		
		-	Pipe bends	"	"	307	33,7		80	0,6	-	1		
		1	Measuring point HJM01CT001		"	307	33,7		80	0,6	-	1		


Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
			Valve Station		"									
		3	Valve	01 HJM 10 AA 001- 003	"	307	33,7		80	0,6	-	1		
		1	-	01 HJM 10 AT 001	"	307	33,7		80	0,6	-	1		
	2.3		Auxiliary steam to Oil burner 2		513-0015									
		1	Pipe	01 HJM 20 BR 001	"	307	33,7		80	0,6	-	1		
		-	Pipe bends	"	"	307	33,7		80	0,6	-	1		
		1	Measuring point HJM01CT001		"	307	33,7		80	0,6	-	1		
			Valve Station		"									
		3	Valve	01 HJM 20 AA 001- 003	"	307	33,7		80	0,6	-	1		
		1	-	01 HJM 20 AT 001	"	307	33,7		80	0,6	-	1		
	2.4		Auxiliary steam to Oil burner 3		513-0015									
		1	Pipe	01 HJM 30 BR 001	"	307	33,7		80	0,6	-	1		
		-	Pipe bends	"	"	307	33,7		80	0,6	-	1		
		1	Measuring point HJM01CT001		"	307	33,7		80	0,6	-	1		
			Valve Station		"									
		3	Valve	01 HJM 30 AA 001- 003	"	307	33,7		80	0,6	-	1		
		1	-	01 HJM 30 AT 001	"	307	33,7		80	0,6	-	1		
	2.5		Auxiliary steam to Oil burner 4		513-0015									
		1	Pipe	01 HJM 40 BR 001	"	307	33,7		80	0,6	-	1		
		-	Pipe bends	"	"	307	33,7		80	0,6	-	1		
		1	Measuring point HJM01CT001		"	307	33,7		80	0,6	-	1		
			Valve Station		"									
		3	Valve	01 HJM 40 AA 001- 003	"	307	33,7		80	0,6	-	1		
		1	-	01 HJM 40 AT 001	"	307	33,7		80	0,6	-	1		

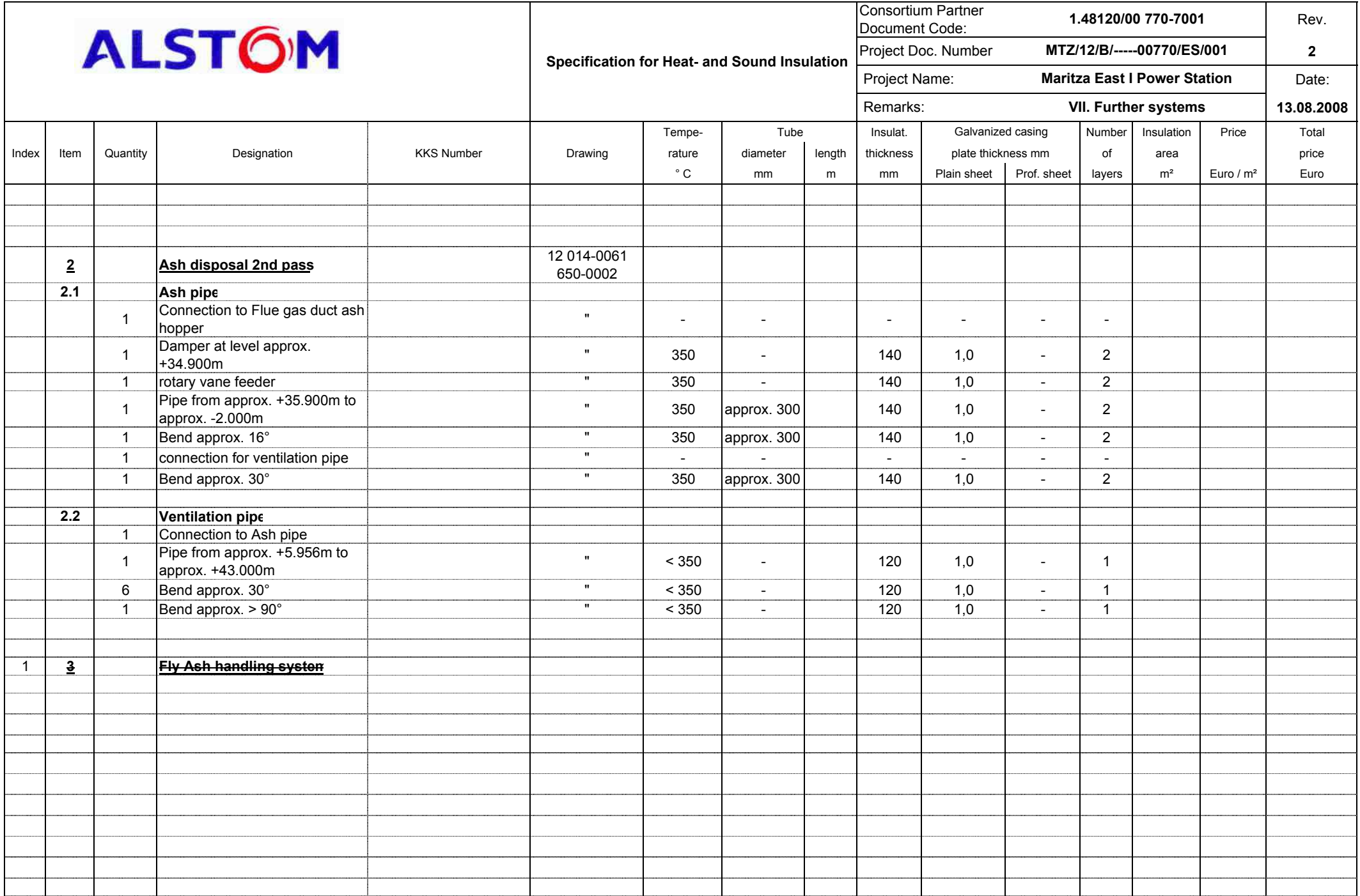
						Specification for Heat- and Sound Insulations			Consortium Partner Document Code: 1.48120/00 770-7001					Rev.	
									Project Doc. Number MTZ/12/B/-----00770/ES/001					2	
									Project Name: Maritza East I Power Station					Date:	
									Remarks: VI. Auxiliary steam piping					13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet Prof. sheet		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
VI. Auxiliary steam piping, total:															


Jr. T190e - 10.1999

Jr. T190e - 10.1999

					Specification for Heat- and Sound Insulation				Consortium Partner Document Code: 1.48120/00 770-7001					Rev.									
									Project Doc. Number MTZ/12/B/-----00770/ES/001					2									
									Project Name: Maritza East I Power Station					Date:									
									Remarks: VII. Further systems					13.08.2008									
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet Prof. sheet		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro								
			<div><p>The cladding of the insulation should be made of galvanized sheets (Emissivity E = 0,35) for inside areas and of aluminium sheets (Emissivity E = 0,24) for outside areas. Thickness of the insulation sheets according DIN 4140 Tab13.</p><p>Insulation material should be mineral wool with approx. 80 kg/m³. Thermal conductivity, approx. I = 0,117 W/mK at 400° C.</p><p>Above 400°C the wire mesh of the mineral wool must be from austenite.</p><p><u>Insulation thickness is calculated with:</u> 0 m/s wind velocity. difference surface temperature / ambient temperature = 25K at a ambient temperature of 35°C</p><p>Insulation thickness has to be checked by the insulation supplier. Details and insulation areas (m²) has to be worked out by the insulation supplier.</p></div>																				


					Specification for Heat- and Sound Insulation			Consortium Partner Document Code: 1.48120/00 770-7001						Rev. 2	
								Project Doc. Number MTZ/12/B/-----00770/ES/001						Date:	
								Project Name: Maritza East I Power Station						13.08.2008	
								Remarks: VII. Further systems							
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
	1		Cooling water circuit		12 014-0100 727-0001										
		2	Pipe outside Boiler house <i>trace heated</i>	01 PGH 02 BR 011 01 PGH 03 BR 009	"	-	273		60	1,0	-	1			
		2	Pipe outside Boiler house to ID Fans <i>trace heated</i>	01 PGH 24 BR 001, 050	"	-	168,3		60	0,7	-	1			
		2	Pipe to ID Fan bearing	01 PGH 25, 27 BR 001	"	-	42,4		60	0,6	-	1			
		2	Funnel for measuring point	-	"	-	-		-	-	-	-			
		1	connection for drain piping	-	"	-	-		-	-	-	-			
		2	Valve	01 PGH 25, 27 AA 001	"	-	42,4		60	0,6	-	1			
		2	Pipe from ID Fan bearing	01 PGH 25, 27 BR 050	"	-	42,4		60	0,6	-	1			
		4	Funnel for measuring point	-	"	-	-		-	-	-	-			
		1	connection for drain piping	-	"	-	-		-	-	-	-			
		2	Valve	01 PGH 25, 27 AA 002	"	-	42,4		60	0,6	-	1			
		2	Pipe to ID Fan motor	01 PGH 26, 28 BR 001	"	-	114,3		60	0,6	-	1			
		2	Funnel for measuring point	-	"	-	-		-	-	-	-			
		1	connection for drain piping	-	"	-	-		-	-	-	-			
		2	Valve	01 PGH 26, 28 AA 001	"	-	114,3		60	0,6	-	1			
		2	Pipe from ID Fan motor	01 PGH 26, 28 BR 050	"	-	114,3		60	0,6	-	1			
		4	Funnel for measuring point	-	"	-	-		-	-	-	-			
		1	connection for drain piping	-	"	-	-		-	-	-	-			
		2	Valve	01 PGH 26, 28 AA 001	"	-	114,3		60	0,6	-	1			
		2	Pipe outside boiler house to FGD consumers, each line approx. 20m long <i>trace heated</i>		"	-	273		60	1,0	-	1			





					Specification for Heat- and Sound Insulation				Consortium Partner Document Code: 1.48120/00 770-7001					Rev.	
									Project Doc. Number MTZ/12/B/-----00770/ES/001					2	
									Project Name: Maritza East I Power Station					Date:	
									Remarks: VII. Further systems					13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Tempe- rature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheetProf. sheet		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
VII. Further Systems, total:															

Ir. T190e - 10.1999


Ir. T190e - 10.1999

					Specification for Heat- and Sound Insulation				Consortium Partner Document Code: 1.48120/00 770-7001				Rev.		
									Project Doc. Number MTZ/12/B/-----00770/ES/001				2		
									Project Name: Maritza East I Power Station				Date:		
									Remarks: VIII Auxiliary Steam Generator				13.08.2008		
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mmlength m		Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheetProf. sheet		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
			The cladding of the insulation should be made of galvanized sheets (Emissivity E = 0,35) for inside areas and of aluminium sheets (Emissivity E = 0,24) for outside areas. Thickness of the insulation sheets according DIN 4140 Tab13.												
			Insulation material should be mineral wool with approx. 80 kg/m³. For temperatures below 520°C Thermal conductivity, approx. l = 0,117 W/mK at 400° C.												
			For temperatures above 520°C, CaMgSi fibre mats (CMS) should be used. Thermal conductivity, approx. l = 0,112 W/mK at 500° C.												
			Above 400°C the wire mesh of the mineral wool must be from austenite.												
			Insulation thickness is calculated with: 0 m/s wind velocity.												
			difference surface temperature / ambient temperature = 25K at a ambient temperature of 35°C												
			Insulation thickness has to be checked by the insulation supplier.												
			Details and insulation areas (m²) has to be worked out by the insulation supplier.												
			P & ID please see:												
			1.48120/00 281-0030 P & ID Auxiliary Steam Generator Water / Steam												
			For general arrangement see:												
			1.48120/00 281-0021 Auxiliary Steam Generator Arrangement Drawing Top View												
			1.48120/00 281-0022 Auxiliary Steam Generator Arrangement Drawing Section AA												
			1.48120/00 281-0023 Auxiliary Steam Generator Arrangement Drawing Section BB												
			1.48120/00 281-0024 Auxiliary Steam Generator Arrangement Drawing Section CC												
			1.48120/00 281-0025 Auxiliary Steam Generator Arrangement Drawing Section DD												
			1.48120/00 281-0026 Auxiliary Steam Generator Arrangement Drawing Section EE												


					Specification for Heat- and Sound Insulation			Consortium Partner Document Code: 1.48120/00 770-7001					Rev.	
								Project Doc. Number MTZ/12/B/-----00770/ES/001					2	
								Project Name: Maritza East I Power Station					Date:	
								Remarks: VIII Auxiliary Steam Generator					13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
			All works on measuring points, flattenings, penetrations of hanging supporting constructions, t-Pieces, vunnels, caps for e.g flanges, valves etc. are included in the scope of the insulation company.											
			Auxiliary Steam Generator available only for Unit 1											
2	1		Auxiliary boiler											
2	1.1		Auxiliary boiler											
2		2	Front plate comments on the drawing 109942 and on the insulation specification TI031 have to be followed	09 QHA 10 09 QHA 20	108378 109630 109942 TI031	-	-		150	1,0		2		
2		4	Connection of burners.	-	"	-	-		-	-				
2		2	Auxiliary boiler comments on the drawing 109942 and on the insulation specification TI031 have to be followed	09 QHA 10 09 QHA 20	108378 109630 109942 TI031	200	4500		100	1,0		1		
2		4	Duct to superheaters		Not insulated, the ducts are covered with refractory lining from inside									
2		4	Superheaters insulated with 100mm CMS and 100mm Min.W comments on the drawing 109942 and on the insulation specification TI031 have to be followed	09 QHA 11 AC 001 09 QHA 12 AC 001 09 QHA 21 AC 001 09 QHA 22 AC 001	108378 109630 109942 TI031	750	-	100mm CMS + 100mm Min.W	1,0	-		2		
2		2	Rear plate comments on the drawing 109942 and on the insulation specification TI031 have to be followed	09 QHA 10 09 QHA 20	108378 109630 109942 TI031	>290	-		175	1,0	-	2		
2		2	Connection duct to flue gas duct comments on the drawing 109942 and on the insulation specification TI031 have to be followed	-	108378 109630 109942 TI031	290	-		130	1,0	-	2		


					Specification for Heat- and Sound Insulation			Consortium Partner Document Code: 1.48120/00 770-7001						Rev.	
								Project Doc. Number MTZ/12/B/-----00770/ES/001						2	
								Project Name: Maritza East I Power Station						Date:	
								Remarks: VIII Auxiliary Steam Generator						13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2	1.2		Steam connection pipe												
2		4	Pipe from boiler to superheater	09 QHA 10 09 QHA 20	108378 109630 109942 TI031	200	273		50	0,7	-	1			
2	2		Feedwater tank												
2		1	Feedwater tank	09 QHG 10 BB 001	108378	103	2500		30	1,0	-	1			
2		1	Deaerator	09 QHG 10 BB 002	108378	103	2000		30	1,0	-	1			
2	3		Piping												
2	3.1		Feed water piping												
2	3.1.1		Feed water piping after feed water tank to pumps												
2		4	Piping	09 QHG 11 09 QHG 12 09 QHG 21 09 QHG 22	JOB/0003	80	273		30	0,7	-	1			
2		4	Valve	09 QHG 11 AA 001 09 QHG 12 AA 001 09 QHG 21 AA 001 09 QHG 22 AA 001	JOB/0003	80	DN 250		30	0,7	-	1			
2		4	Filter	09 QHG 11 AT 001 09 QHG 12 AT 001 09 QHG 21 AT 001 09 QHG 22 AT 001	JOB/0003	80	273		30	0,7	-	1			
2		4	Expansion joint	"	JOB/0003	80	273		30	0,7	-	1			
2		-	Measuring points	-	JOB/0003	-	-	-	-	-	-	-			
2	3.1.2		Feed water pumps												
2		4	Pump	09 QHG 11 AP 001 09 QHG 12 AP 001 09 QHG 21 AP 001 09 QHG 22 AP 001	JOB/0003	80	-		30	0,7	-	1			


<div>ALSTOM</div>					Specification for Heat- and Sound Insulation			Consortium Partner Document Code: 1.48120/00 770-7001						Rev.	
								Project Doc. Number MTZ/12/B/-----00770/ES/001						2	
								Project Name: Maritza East I Power Station						Date:	
								Remarks: VIII Auxiliary Steam Generator						13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2	3.1.3		Feed water downstream pumps												
2		4	Pipe up to T-Piece	09 QHG 11 09 QHG 12 09 QHG 21 09 QHG 22	JOBI/0003	103	114,3		30	0,6	-	1			
2		4	Non - return flap	09 QHG 11 AA 002 09 QHG 12 AA 002 09 QHG 21 AA 002 09 QHG 22 AA 002	JOBI/0003	103	DN 100		30	0,6	-	1			
2		4	Valve	09 QHG 11 AA 003 09 QHG 12 AA 003 09 QHG 21 AA 003 09 QHG 22 AA 003	JOBI/0003	103	DN 100		30	0,6	-	1			
2		2	T-Piece	09 QHG 11 09 QHG 12 09 QHG 21 09 QHG 22	JOBI/0003	103	168,3/114,3		30	#WERT!	-	1			
2		2	Pipe DN 150	09 QHG 15 09 QHG 25	JOBI/0003	103	168,3		30	0,6	-	1			
2		4	Transition Piece DN150/DN100	09 QHG 15 09 QHG 25	JOBI/0003	103	168,3/114,3		30	0,6	-	1			
2		4	T-Piece	09 QHG 15 09 QHG 25	JOBI/0003	103	114,3		30	0,6	-	1			
2		4	Pipe DN 100	09 QHG 15 09 QHG 11 09 QHG 25 09 QHG 22	JOBI/0003	103	114,3		30	0,6	-	1			
2		6	Valve	09 QHG 15 AA 002 09 QHG 15 AA 004 09 QHG 15 AA 005 09 QHG 25 AA 002 09 QHG 25 AA 004 09 QHG 25 AA 005	JOBI/0003	103	DN 100		30	0,6	-	1			
2		2	Filter	09 QHG 15 AT 001 09 QHG 25 AT 001	JOBI/0003	103	114,3		30	0,6	-	1			
2		2	Valve	09 QHG 15 AA 003 09 QHG 25 AA 003	JOBI/0003	103	DN 100		30	0,6	-	1			


					Specification for Heat- and Sound Insulation			Consortium Partner Document Code: 1.48120/00 770-7001					Rev.	
								Project Doc. Number MTZ/12/B/-----00770/ES/001					2	
								Project Name: Maritza East I Power Station					Date:	
								Remarks: VIII Auxiliary Steam Generator					13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2	3.1.3	2	Transition Piece DN100/DN150	09 QHG 15 09 QHG 25	JOB/0003	103	114,3/168,3		30	0,6	-	1		
2		2	Pipe to boiler	09 QHG 15 09 QHG 25	JOB/0003	103	168,3		30	0,6	-	1		
2		2	Transition Piece DN150/DN100	09 QHG 15 09 QHG 25	JOB/0003	103	168,3/114,3		30	0,6	-	1		
2		2	Non - return flap	09 QHG 15 AA 006 09 QHG 25 AA 006	JOB/0003	103	DN 100		30	0,6	-	1		
2		2	Valve	09 QHG 15 AA 007 09 QHG 25 AA 007	JOB/0003	103	DN 100		30	0,6	-	1		
2	3.2		Feedwater bypass line											
2		2	Pipe downstream 09QHG15/25 AA003	09 QHG 16 09 QHG 26	JOB/0003	103	48,3		30	0,5	-	1		
2		2	Valve	09 QHG 16 AA 202 09 QHG 26 AA 202	JOB/0003	103	DN 40		30	0,5	-	1		
2		2	Transition Piece DN40/DN80	09 QHG 16 09 QHG 26	JOB/0003	103	48,3/88,9		30	0,6	-	1		
2		2	Transition Piece DN80/DN100	09 QHG 16 09 QHG 26	JOB/0003	103	88,9/114,3		30	0,6	-	1		
2		2	Pipe to T-Piece	09 QHG 16 09 QHG 26	JOB/0003	103	114,3		30	0,6	-	1		
2		2	Transition Piece DN100/DN150	09 QHG 16 09 QHG 26	JOB/0003	103	114,3/168,3		30	0,6	-	1		
2		1	T-Piece	09 QHG 10	JOB/0003	103	168,3		30	0,6	-	1		


<div>ALSTOM</div>					Specification for Heat- and Sound Insulation				Consortium Partner Document Code: 1.48120/00 770-7001						Rev.
									Project Doc. Number MTZ/12/B/-----00770/ES/001						2
									Project Name: Maritza East I Power Station						Date:
									Remarks: VIII Auxiliary Steam Generator						13.08.2008
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2	3.3		Steam Piping after Auxiliary Boiler												
2	3.3.1		Steam Piping after Auxiliary Boiler												
2		4	Pipe from Aux. Boiler to valve 001	09QHA11 09QHA12 09QHA21 09QHA22	JOB/0001 JOB/0002	260	219,1		70	0,7	-	1			
2		4	Transition Piece DN200/DN150	"	JOB/0001 JOB/0002	260	219,1/168,3		70	0,7	-	1			
2		4	Valve	09 QHA 11 AA 001 09 QHA 12 AA 001 09 QHA 21 AA 001 09 QHA 22 AA 001	JOB/0001 JOB/0002	260	DN 150		70	0,7	-	1			
2		4	Non - return flap	09 QHA 11 AA 002 09 QHA 12 AA 002 09 QHA 21 AA 002 09 QHA 22 AA 002	JOB/0001 JOB/0002	260	DN 150		70	0,7	-	1			
2		4	Transition Piece DN150/DN200	09QHA11 09QHA12 09QHA21 09QHA22	JOB/0001 JOB/0002	260	168,3/219,1		70	0,7	-	1			
2		4	Expansion joint	09QHA11 09QHA12 09QHA21 09QHA22	JOB/0001 JOB/0002	260	168,3		70	0,7	-	1			
2		4	Pipe downstream valve 002	09 QHA 11 BR 010 09 QHA 12 BR 010 09 QHA 21 BR 010 09 QHA 22 BR 010	JOB/0001 JOB/0002	260	219,1		70	0,7	-	1			
2		4	Transition Piece DN200/DN250	09QHA11 09QHA12 09QHA21 09QHA22	JOB/0001 JOB/0002	260	219,1/273		80	1,0	-	1			
2		4	Pipe upstream T-Piece	"	JOB/0001 JOB/0002	260	273		80	1,0	-	1			
2		2	T-Piece	09QHA15 09QHA25	JOB/0001 JOB/0002	260	DN250		80	1,0	-	1			
2		2	Pipe downstream T-Piece to connection TP4a and TP4b	09QHA15 09QHA25	JOB/0001 JOB/0002	260	DN250		80	1,0	-	1			

					Specification for Heat- and Sound Insulation			Consortium Partner Document Code: 1.48120/00 770-7001						Rev.	
								Project Doc. Number MTZ/12/B/-----00770/ES/001						2	
								Project Name: Maritza East I Power Station						Date:	
								Remarks: VIII Auxiliary Steam Generator						13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2	3.3.2		Steam supply system												
2		2	Steam pipe downstream connection TP4a and TP4b	09 QHA 15 BR 010 09 QHA 25 BR 010	283-0040 283-0201 283-0202	260	273		80	1,0	-	1			
2		2	Valve	09 QHA 15 AA 001 09 QHA 25 AA 001	283-0040 283-0201 283-0202	260	DN 250		80	1,0	-	1			
2		1	Transition Piece DN250/DN350	09 QHA 30 BR 010	283-0040 283-0203	260	355		80	1,0	-	1			
2		1	T-Piece	09 QHA 30 BR 010	283-0040 283-0203	260	355		80	1,0	-	1			
2		1	Pipe up to connection TP326 (APC)	09 QHA 30 BR 010	283-0040 283-0203	260	355		80	1,0	-	1			
2		1	Vent Pipe personnel protection only in the area of cable ways and platforms		283-0040 283-0203	260	31,8		50	0,6	-	1			
2		1	Valve personnel protection only in the area of cable ways and platforms	09 QHA 30 AA 251	283-0040 283-0203	260	DN 25		50	0,6	-	1			
2	3.3.3		Steam supply to LFO and Water treatment												
2		1	Transition Piece DN200/DN100	09 QHA 30 BR 020	283-0040 283-0203	260	219,1/114,3		70	0,7	-	1			
2		1	Pipe	09 QHA 30 BR 020	283-0040 283-0204	260	114,3		70	0,7	-	1			
2	3.3.4		Drain Pipe												
2		1	T-Piece personnel protection only in the area of cable ways and platforms	09 QHA 30 BR 202	283-0040	260	88,9		60	0,6	-	1			
2		1	Transition Piece DN80/DN40 personnel protection only in the area of cable ways and platforms	09 QHA 30 BR 202	283-0040	260	88,9/48,3		60	0,6	-	1			


					Specification for Heat- and Sound Insulation			Consortium Partner Document Code: 1.48120/00 770-7001						Rev.	
								Project Doc. Number MTZ/12/B/-----00770/ES/001						2	
								Project Name: Maritza East I Power Station						Date:	
								Remarks: VIII Auxiliary Steam Generator						13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2		1	Pipe personnel protection only in the area of cable ways and platforms	09 QHA 30 BR 202	283-0040	260	48,3		60	0,6	-	1			
2	3.3.4	1	Valve personnel protection only in the area of cable ways and platforms	09 QHA 30 AA 202	283-0040	260	DN 40		60	0,6	-	1			
2		1	Valve personnel protection only in the area of cable ways and platforms	09 QHA 30 AA 204	283-0040	260	DN 40		60	0,6	-	1			
2		1	Transition Piece DN32/DN20 personnel protection only in the area of cable ways and platforms	09 QHA 30 BR 201	283-0040	260	42,4/26,9		60	0,6	-	1			
2		1	Pipe personnel protection only in the area of cable ways and platforms	09 QHA 30 BR 201	283-0040	260	26,9		50	0,5	-	1			
2		1	Valve personnel protection only in the area of cable ways and platforms	09 QHA 30 AA 201	283-0040	260	DN 20		50	0,5	-	1			
2		1	Filter AT 001 personnel protection only in the area of cable ways and platforms	09 QHA 30 AT 001	283-0040	260	DN 20		50	0,5	-	1			
2		1	Valve personnel protection only in the area of cable ways and platforms	09 QHA 30 AA 203	283-0040	260	DN 20		50	0,5	-	1			
2	3.4		Safety Valves for Aux. Start up system												
2	3.4.1		Safety valves												
2		4	Pipe to Safety valve	09 QHA 37 09 QHA 38 09 QHA 47 09 QHA 48	JOB/0001 JOB/0002	260	168,3		70	0,7	-	1			
2		4	Safety valve	09 QHA 37 AA 202 09 QHA 38 AA 202 09 QHA 47 AA 202 09 QHA 48 AA 202	JOB/0001 JOB/0002	260	DN 150		70	0,7	-	1			
2		4	Pipe downstream safety valve to blow off pipe	09 QHA 37 09 QHA 38 09 QHA 47 09 QHA 48	JOB/0001 JOB/0002	260	168,3		70	0,7	-	1			
2	3.4.2		Blow off pipe												

					Specification for Heat- and Sound Insulation			Consortium Partner Document Code: 1.48120/00 770-7001						Rev.	
								Project Doc. Number MTZ/12/B/-----00770/ES/001						2	
								Project Name: Maritza East I Power Station						Date:	
								Remarks: VIII Auxiliary Steam Generator						13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2		2	Blow off pipe up to roof penetration	09 QHA 13 09 QHA 23	JOB/0001 JOB/0002	260	355,6		80	1,0	-	1			
2	3.4.3		Piping downstream Heating up Pipe												
2		4	Pipe from Heating up Pipe to blow off pipe	09 QHA 37 09 QHA 38 09 QHA 47 09 QHA 48	JOB/0001 JOB/0002	260	114,3		70	0,7	-	1			
2		4	Valve	09 QHA 37 AA 003 09 QHA 38 AA 003 09 QHA 47 AA 003 09 QHA 48 AA 003	JOB/0001 JOB/0002	260	DN100		70	0,7	-	1			
2	3.5		Heating up piping												
2	3.5.1		Pipe after steam pipe												
2		4	Pipe	09 QHA 33 09 QHA 34 09 QHA 43 09 QHA 44	JOB/0001 JOB/0002 JOB/0004	260	139,7		70	0,7	-	1			
2		4	Non - return flap	09 QHA 33 AA 004 09 QHA 34 AA 004 09 QHA 43 AA 004 09 QHA 44 AA 004	JOB/0001 JOB/0002 JOB/0004	260	DN 125		70	0,7	-	1			
2		4	Valve	09 QHA 33 AA 005 09 QHA 34 AA 005 09 QHA 43 AA 005 09 QHA 44 AA 005	JOB/0001 JOB/0002 JOB/0004	260	DN 125		70	0,7	-	1			
2	3.5.2		Heating up pipe to Feed Water Tank												
2		1	Horizontal pipe	09 QHA 50	JOB/0004	260	139,7		70	0,7	-	1			
2		1	Vertical pipe to Fees Water Tank	09 QHA 50	JOB/0004	260	139,7		70	0,7	-	1			
2		1	Valve	09 QHA 50 AA 001	JOB/0004	260	DN 125		70	0,7	-	1			
2		1	Filter	09 QHA 50 AT 001	JOB/0004	260	139,7		70	0,7	-	1			
2		1	Valve	09 QHA 50 AA 002	JOB/0004	260	DN 125		70	0,7	-	1			

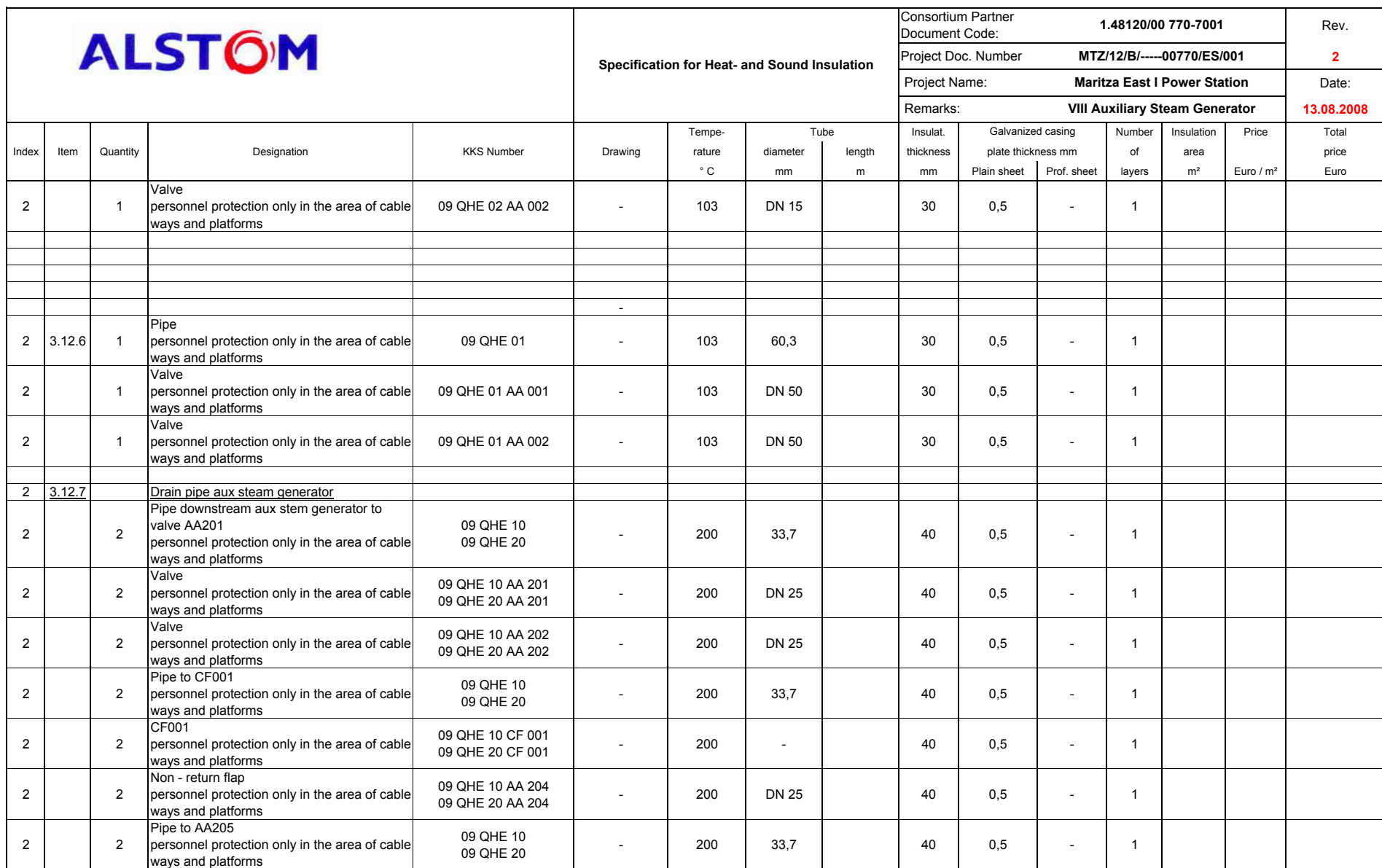
					Specification for Heat- and Sound Insulation			Consortium Partner Document Code: 1.48120/00 770-7001						Rev.	
								Project Doc. Number MTZ/12/B/-----00770/ES/001						2	
								Project Name: Maritza East I Power Station						Date:	
								Remarks: VIII Auxiliary Steam Generator						13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2	3.5.3		SH Steam Bypass												
2		4	Piping	09 QHA 31 09 QHA 32 09 QHA 41 09 QHA 42	JOB/0001 JOB/0002	200	26,9		40	0,5	-	1			
2		4	Valve	09 QHA 31 AA 210 09 QHA 32 AA 210 09 QHA 41 AA 210 09 QHA 42 AA 210	JOB/0001 JOB/0002	200	DN 20		40	0,5	-	1			
2	3.6		Non pressure condensate with O2												
2		2	Valve downstream TP8	09 LCN 31 AA 001 09 LCN 31 AA 002	JOB/0004	80	DN 100		30	0,6	-	1			
2		1	Pipe to deaerator	09 LCN 31	JOB/0004	80	114,3		30	0,6	-	1			
2		1	Expansion joint	09 LCN 31	JOB/0004	80	114,3		30	0,6	-	1			
2	3.7		Vent pipe deaerator												
2		1	Pipe downstream deaerator up to valve AA001	09 QHG 10	JOB/0004	110	114,3		30	0,6	-	1			
2		1	Filter	09 QHG 10 AT 001	JOB/0004	110	114,3		30	0,6	-	1			
2		1	Valve	09 QHG 10 AA 001	JOB/0004	110	DN 100		30	0,6	-	1			
												1			
2		1	Transition Piece DN100/DN150	09 QHG 10	JOB/0004	110	114,3/168,3		30	0,6	-	1			
2		1	Pipe DN150 up to roof penetration	09 QHG 10	JOB/0004	110	168,3		30	0,6	-	1			
2	3.8		N2 Piping												
2	3.8.1		N2 Piping to deaerator venting												
2		1	Pipe up to the second bend	09 QHG 10	JOB/0004	10	26,3		30	0,5	-	1			
2	3.8.2		N2 Piping to start up pipe												
2		4	Valve	09 QHA 35 AA 215 09 QHA 36 AA 215 09 QHA 45 AA 215 09 QHA 46 AA 215	JOB/0001 JOB/0002	10	26,3		50	0,5	-	1			


					Specification for Heat- and Sound Insulation			Consortium Partner Document Code: 1.48120/00 770-7001						Rev.	
								Project Doc. Number MTZ/12/B/-----00770/ES/001						2	
								Project Name: Maritza East I Power Station						Date:	
								Remarks: VIII Auxiliary Steam Generator						13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2		4	Pipe from valve AA215 to start up pipe	09 QHA 35 09 QHA 36 09 QHA 45 09 QHA 46	JOB/0001 JOB/0002	10	26,3		50	0,5	-	1			
2	3.8.3		N2 Piping to pipe from boiler to superheater												
2		2	Valve	09 QHA 11 AA 206 09 QHA 12 AA 206	-	10	26,3		40	0,5	-	1			
2		2	Pipe from valve AA206 pipe	09 QHA 11 09 QHA 12	-	10	26,3		40	0,5	-	1			
2	3.9		Safety Valves for Aux. Boiler												
2	3.9.1		Safety valves												
2		4	Pipe to Safety valve	09 QHA 10 09 QHA 20	JOB/0004	200	114,3		50	0,6	-	1			
2		4	Safety valve	09 QHA 10 AA 001 09 QHA 10 AA 002 09 QHA 20 AA 001 09 QHA 20 AA 002	JOB/0004	200	DN 100		50	0,6	-	1			
2		4	Pipe downstream safety valve to blow off pipe	09 QHA 10 09 QHA 20	JOB/0004	200	168,3		50	0,7	-	1			
2	3.9.2		Blow off pipe												
2		2	Blow off pipe up to roof penetration	09 QHA 10 09 QHA 20	JOB/0004	200	355,6		60	1,0	-	1			
2		2	Roof penetration	-	JOB/0004	-	-		-	-	-	-			
2	3.10		Safety Valves for Feed Water Tank												
2	3.9.1		Safety valves												
2		2	Pipe to Safety valve	09 QHG 10	JOB/0004	103	168,3		30	0,6	-	1			
2		2	Safety valve	09 QHG 10 AA 201 09 QHG 10 AA 202	JOB/0004	103	DN 150		30	0,6	-	1			
2		2	Pipe downstream safety valve to blow off pipe	09 QHG 10	JOB/0004	103	273		30	0,7	-	1			
2	3.9.2		Blow off pipe												
2		1	Blow off pipe up to roof penetration	09 QHG 10	JOB/0004	103	406,4		30	1,0	-	1			
2		2	Roof penetration	-	JOB/0004	-	-		-	-	-	-			

<div>ALSTOM</div>					Specification for Heat- and Sound Insulation				Consortium Partner Document Code: 1.48120/00 770-7001					Rev.	
									Project Doc. Number MTZ/12/B/-----00770/ES/001					2	
									Project Name: Maritza East I Power Station					Date:	
									Remarks: VIII Auxiliary Steam Generator					13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mmlength m		Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheetProf. sheet		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2	3.12.1	4	Pipe up to valve AA203 personnel protection only in the area of cable ways and platforms	09 QHA 16 09 QHA 17 09 QHA 26 09 QHA 27	-	260	26,9		50	0,5	-	1			
2		4	Pipe up to valve AA204 personnel protection only in the area of cable ways and platforms	09 QHA 16 09 QHA 17 09 QHA 26 09 QHA 27	-	260	26,9		50	0,5	-	1			
2		4	Valve personnel protection only in the area of cable ways and platforms	09 QHA 16 AA 203 09 QHA 17 AA 203 09 QHA 26 AA 203 09 QHA 27 AA 203	-	260	DN 20		50	0,5	-	1			
2		4	Valve personnel protection only in the area of cable ways and platforms	09 QHA 16 AA 204 09 QHA 17 AA 204 09 QHA 26 AA 204 09 QHA 27 AA 204	-	260	DN 20		50	0,5	-	1			
2		4	Steam Trap personnel protection only in the area of cable ways and platforms	09 QHA 16 AT 201 09 QHA 17 AT 201 09 QHA 26 AT 201 09 QHA 27 AT 201	-	260	-		50	0,5	-	1			
2		4	Valve personnel protection only in the area of cable ways and platforms	09 QHA 16 AA 205 09 QHA 17 AA 205 09 QHA 26 AA 205 09 QHA 27 AA 205	-	260	DN 20		50	0,5	-	1			
2		4	Pipe downstream valve AA203 personnel protection only in the area of cable ways and platforms	09 QHA 16 09 QHA 17 09 QHA 26 09 QHA 27	-	260	26,9		50	0,5	-	1			
2		4	Pipe up to valve AA208 personnel protection only in the area of cable ways and platforms	09 QHA 16 09 QHA 17 09 QHA 26 09 QHA 27	-	260	26,9		50	0,5	-	1			
2		4	Valve personnel protection only in the area of cable ways and platforms	09 QHA 16 AA 208 09 QHA 17 AA 208 09 QHA 26 AA 208 09 QHA 27 AA 208	-	260	DN 20		50	0,5	-	1			


					Specification for Heat- and Sound Insulation			Consortium Partner Document Code: 1.48120/00 770-7001						Rev.	
								Project Doc. Number MTZ/12/B/-----00770/ES/001						2	
								Project Name: Maritza East I Power Station						Date:	
								Remarks: VIII Auxiliary Steam Generator						13.08.2008	
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2		2	Pipe to Blow down vessel personnel protection only in the area of cable ways and platforms	09 QHA 16 09 QHA 26	-	260	DN 20		50	0,5	-	1			
2	3.12.2		<u>Drain piping downstream start up Safety valve</u>												
2		2	Pipe downstream blow off pipe personnel protection only in the area of cable ways and platforms	-	-	100	26,9		30	0,5	-	1			
2		4	Pipe downstream Safety valve personnel protection only in the area of cable ways and platforms	-	-	100	26,9		30	0,5	-	1			
2		2	Pipe to connection (item 3.12.1) personnel protection only in the area of cable ways and platforms	-	-	100	26,9		30	0,5	-	1			
2	3.12.3		<u>Drain piping downstream Aux. boiler Safety valve</u>												
2		2	Pipe downstream blow off pipe personnel protection only in the area of cable ways and platforms	-	-	100	26,9		30	0,5	-	1			
2		4	Pipe downstream Safety valve personnel protection only in the area of cable ways and platforms	-	-	100	26,9		30	0,5	-	1			
2		2	Pipe up toQHE01 line personnel protection only in the area of cable ways and platforms	-	-	100	26,9		30	0,5	-	1			
2	3.12.4		<u>Drain piping downstream feed water tank Safety valve</u>												
2		1	Pipe downstream blow off pipe personnel protection only in the area of cable ways and platforms	-	-	100	26,9		30	0,5	-	1			
2		2	Pipe downstream Safety valve personnel protection only in the area of cable ways and platforms	-	-	100	26,9		30	0,5	-	1			
2		1	Pipe to connection (item 3.12.5) personnel protection only in the area of cable ways and platforms	-	-	100	26,9		30	0,5	-	1			

<div>ALSTOM</div>					Specification for Heat- and Sound Insulation				Consortium Partner					Rev.	
									Document Code: 1.48120/00 770-7001						
									Project Doc. Number MTZ/12/B/-----00770/ES/001						
									Project Name: Maritza East I Power Station						
					Remarks: VIII Auxiliary Steam Generator					Date: 13.08.2008					
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2		1	Pipe up to GEHE 01 line personnel protection only in the area of cable ways and platforms	-	-	100	26,9		30	0,5	-	1			
2	3.12.4	1	QHE 01 line personnel protection only in the area of cable ways and platforms	-	-	100	33,7		30	0,5	-	1			
2		1	Valve personnel protection only in the area of cable ways and platforms	09 QHE 01 AA 003		100	DN 25		30	0,5	-	1			
2		1	Pipe to drain pit personnel protection only in the area of cable ways and platforms	-	-	100	33,7		30	0,5	-	1			
2		1	Valve personnel protection only in the area of cable ways and platforms	09 QHE 30 AA 004		100	DN 25		30	0,5	-	1			
2	3.12.5		Drain and vent pipe downstream feed water tank												
2		1	Vent pipe personnel protection only in the area of cable ways and platforms	09 QHG 10	-	100	60,3		30	0,5	-	1			
2		1	Valve personnel protection only in the area of cable ways and platforms	09 QHG 10 AA 203	-	100	DN 50		30	0,5	-	1			
2		1	Drain pipe to connection (item 3.12.4) personnel protection only in the area of cable ways and platforms	-	-	100	26,9		30	0,5	-	1			
2	3.12.6		Drain pipe feed water tank												
2		1	Pipe personnel protection only in the area of cable ways and platforms	09 QHE 02	-	103	17,2		30	0,5	-	1			
2		1	Valve personnel protection only in the area of cable ways and platforms	09 QHE 02 AA 001	-	103	DN 10		30	0,5	-	1			



					Specification for Heat- and Sound Insulation			Consortium Partner Document Code: 1.48120/00 770-7001						Rev.	
								Project Doc. Number MTZ/12/B/-----00770/ES/001						2	
								Project Name: Maritza East I Power Station						Date:	
								Remarks: VIII Auxiliary Steam Generator						13.08.2008	
Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2		2	Non - return flap personnel protection only in the area of cable ways and platforms	09 QHE 10 AA 205 09 QHE 20 AA 205	-	200	DN 25		40	0,5	-	1			
2	3.12.7	2	Pipe to water cooler personnel protection only in the area of cable ways and platforms	09 QHE 10 09 QHE 20	-	200	17,2		30	0,5	-	1			
2		2	Valve personnel protection only in the area of cable ways and platforms	09 QHE 10 AA 203 09 QHE 20 AA 203	-	200	DN 10		30	0,5	-	1			
2		2	Valve personnel protection only in the area of cable ways and platforms	09 QHE 10 AA 005 09 QHE 20 AA 005	-	200	DN 15		30	0,5	-	1			
2		2	Pipe downstream aux stem generator to valve AA001 personnel protection only in the area of cable ways and platforms	09 QHE 11 09 QHE 21	-	200	48,3		40	0,6	-	1			
2		2	Valve personnel protection only in the area of cable ways and platforms	09 QHE 11 AA 001 09 QHE 21 AA 001	-	200	DN 40		40	0,6	-	1			
2		2	Valve personnel protection only in the area of cable ways and platforms	09 QHE 11 AA 002 09 QHE 21 AA 002	-	200	DN 40		40	0,6	-	1			
2		2	Transition Piece DN40/DN65 personnel protection only in the area of cable ways and platforms	09 QHE 11 09 QHE 21	-	200	48,3/76,1		50	0,6	-	1			
2		2	Pipe to valve AA003 personnel protection only in the area of cable ways and platforms	09 QHE 11 09 QHE 21	-	200	76,1		50	0,6	-	1			
2		2	Valve personnel protection only in the area of cable ways and platforms	09 QHE 11 AA 003 09 QHE 21 AA 003	-	200	DN 65		50	0,6	-	1			
2		2	Pipe to valve AA303 personnel protection only in the area of cable ways and platforms	09 QHE 11 09 QHE 21	-	200	33,7		40	0,5	-	1			

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Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mmlength m		Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheetProf. sheet		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2		2	Valve personnel protection only in the area of cable ways and platforms	09 QHE 11 AA 303 09 QHE 21 AA 303	-	200	DN 25		40	0,5	-	1			
2		2	Pipe to drain pit personnel protection only in the area of cable ways and platforms	09 QHE 11 09 QHE 21	-	200	33,7		40	0,5	-	1			
2	3.12.8		Drain pipe downstream pipe to superheater												
2		4	Pipe up to valve AA201 personnel protection only in the area of cable ways and platforms	09 QHA 13 09 QHA 14 09 QHA 23 09 QHA 24	-	260	26,9		50	0,5	-	1			
2		4	Valve personnel protection only in the area of cable ways and platforms	09 QHA 13 AA 201 09 QHA 14 AA 201 09 QHA 23 AA 201 09 QHA 24 AA 201	-	260	DN 20		50	0,5	-	1			
2		8	Pipe up to valve AA202 and AA203 personnel protection only in the area of cable ways and platforms	09 QHA 13 09 QHA 14 09 QHA 23 09 QHA 24	-	260	26,9		50	0,5	-	1			
2		4	Valve personnel protection only in the area of cable ways and platforms	09 QHA 13 AA 202 09 QHA 14 AA 202 09 QHA 23 AA 202 09 QHA 24 AA 202	-	260	DN 20		50	0,5	-	1			
2		4	Valve personnel protection only in the area of cable ways and platforms	09 QHA 13 AA 203 09 QHA 14 AA 203 09 QHA 23 AA 203 09 QHA 24 AA 203	-	260	DN 20		50	0,5	-	1			
2		4	Steam Trap personnel protection only in the area of cable ways and platforms	09 QHA 13 AT 001 09 QHA 14 AT 001 09 QHA 23 AT 001 09 QHA 24 AT 001	-	260	-		50	0,5	-	1			
2		4	Pipe up to valve AA204 personnel protection only in the area of cable ways and platforms	09 QHA 13 09 QHA 14 09 QHA 23 09 QHA 24	-	260	26,9		50	0,5	-	1			

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								Project Doc. Number MTZ/12/B/-----00770/ES/001						2	
								Project Name: Maritza East I Power Station						Date:	
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Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm		Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2		4	Non - return flap personnel protection only in the area of cable ways and platforms	09 QHA 13 AA 204 09 QHA 14 AA 204 09 QHA 23 AA 204 09 QHA 24 AA 204	-	260	DN 20		50	0,5	-	1			
2		4	Pipe up to blow down vesel personnel protection only in the area of cable ways and platforms	09 QHA 13 09 QHA 14 09 QHA 23 09 QHA 24	-	260	26,9		50	0,5	-	1			
2	3.12.8	4	Vent pipe personnel protection only in the area of cable ways and platforms	09 QHA 11 09 QHA 12 09 QHA 21 09 QHA 22	-	260	26,9		50	0,5	-	1			
2		4	Valve personnel protection only in the area of cable ways and platforms	09 QHA 11 AA 201 09 QHA 12 AA 201 09 QHA 21 AA 201 09 QHA 22 AA 201	-	260	DN 20		50	0,5	-	1			
2	3.12.9		Flue gas condensate												
2		4	Pipe up to sample personnel protection only in the area of cable ways and platforms	09 QHA 11 09 QHA 21	-	200	26,9		40	0,5	-	1			
2		2	Pipe to drain pit personnel protection only in the area of cable ways and platforms	09 QHA 11 09 QHA 21	-	100	26,9		30	0,5	-	1			
2	3.12.10		Blow down vesel												
2		1	Blow down vesel personnel protection only in the area of cable ways and platforms	09 QHE 30 BB 001	JOBI/0005	100	-		30	1,0	-	1			
2		1	Collector DN80 personnel protection only in the area of cable ways and platforms	-	JOBI/0005	100	88,9		30	0,6	-	1			
2		1	Collector DN100 personnel protection only in the area of cable ways and platforms	-	JOBI/0005	100	114,3		30	0,6	-	1			
2		1	Pipe to drain pit personnel protection only in the area of cable ways and platforms	09 QHE 30	JOBI/0005	100	114,3		30	0,6	-	1			

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Index	Item	Quantity	Designation	KKS Number	Drawing	Temperature ° C	Tube diameter mm	length m	Insulat. thickness mm	Galvanized casing plate thickness mm Plain sheet	Prof. sheet	Number of layers	Insulation area m²	Price Euro / m²	Total price Euro
2		1	Blow off pipe up to roof penetration personnel protection only in the area of cable ways and platforms	09 QHE 30	JOB/0005	100	273		30	0,7	-	1			
2		1	Roof penetration	-	JOB/0005	-	-		-	-	-	-			
VIII. Auxiliary Steam Generator, total:															

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