

Employer
SAKO BRNO A.S.

Project
**High-efficient combined heat and power facility utilizing renewable sources (OHB
II - line K1)**

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PART III, APPENDIX A18

LIMITS OF SUPPLY



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(OHB II - line K1)**

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CONTENTS

1.	Introduction	2
2.	Limits of Supply for Mechanical Equipment	3
3.	Limits of Supply for Electrical Equipment	9
4.	Limits of Supply for CMS	10
5.	Limits of Supply for Civil Works (Buildings)	12

1. INTRODUCTION

This appendix presents the limits of supply for the Contract Object. The document is supported by Appendices A15 *Concept Diagrams for Process*, A16 *Concept Diagrams for Electrical System* and A17 *Concept Diagrams for CMS*.

Abbreviations used in the following are:

E:	Employer
C:	Contractor
M:	Mechanical supply limit
E:	Electrical supply limit
CMS:	Control and Monitoring System supply limit
B:	Civil works & buildings supply limit
NA:	Not Applicable

2. LIMITS OF SUPPLY FOR MECHANICAL EQUIPMENT

ID	Medium	Description	Sending	Scope of Works	Receiving	Scope of Works	Concept diagram
Air							
M1	Combustion air	Primary air for Line	NA		C	Inlets at the waste bunker top.	A15.1
M2	Combustion air	Secondary air inlets at the IBA extractor and above the IBA conveyors.	NA		C	Inlets at the IBA extractor and above the IBA conveyors.	A15.1
M3	Combustion air	Secondary air inlets at the top of waste bunker or boiler hall.	NA		C	Inlets at the waste bunker top or top of boiler hall.	A15.1
M4	Air	Air evacuation equipment	C	Outlet to open air outside the building.	NA		
Compressed air							
M5	Instrument air	Instrument air from existing compressed air station.	E	Existing discharge pipe for main connection at the existing compressed air station.	C	Welded connection to existing pipe including closing valve close to welded connection, piping and distribution system needed for Line.	
M6	Service air	Service air from existing compressed air station.	E	Existing discharge pipe for main connection at the existing compressed air station.	C	Welded connection to existing pipe including closing valve close to welded connection, piping and distribution system needed for Line.	
Component cooling water							
M7	Component cooling water	Outlet flange for forward component cooling water from existing component cooling system.	E	Outlet DN200 flange for main connection at the existing component cooling glycol tank.	C	Connection to flange, piping any necessary booster pumps and all related Works.	

ID	Medium	Description	Sending	Scope of Works	Receiving	Scope of Works	Concept diagram
M8	Component cooling water	Inlet flange for return component cooling water to existing component cooling system.	C	Connection to flange, piping and all related works.	E	Inlet DN200 flange for main connection at the existing component cooling glycol tank.	
Water							
M9	Fresh water	Fresh water supply for the Line	E	Fresh water supply pipe located nearby the new Line building.	C	Connection to the pipe, flange, piping, booster pumps and all related works.	E1
M10	Fire water	Fire water supply for the Line and entire waste bunker	E	Fresh water supply pipe located nearby the new Line building.	C	Connection to the pipe, flange, piping, booster pumps and all related works.	E1
M11	Wastewater	Wastewater from wastewater pit to IBA wastewater pit	C	Overflow piping and connection from wastewater pit to Employer's existing IBA wastewater pit.	E	Existing IBA wastewater pit	A15.1 A15.4
M12	Discharge	Discharge, drains etc. <i>(Discharge only allowed under special operational conditions upon Employer's acceptance).</i>	C	Connection to Employer's existing IBA wastewater pit., piping and all related works.	E	Existing IBA wastewater pit	A15.4
Residues							
M13	IBA	Inlet to Employer's existing IBA bunker.	C	Conveyor transport solution to existing IBA bunker including all related Works	E	Existing IBA bunker	A15.1
M14	Boiler ash	Connection point on top of Employer's existing end product silo 1 and 2 (solidification silos).	C	All necessary Works including but not limited to establishment of necessary connection flanges at the existing storage silos, manual closing valve for each silo, all necessary distribution, dosing equipment, and piping	E	Existing end product silo 1 and 2	A15.2

ID	Medium	Description	Sending	Scope of Works	Receiving	Scope of Works	Concept diagram
				for distribution to both silo 1 and 2.			
M15	FGT residue	Connection point on top of Employer's existing end product silo 1 and 2 (solidification silos).	C	All necessary Works including but not limited to establishment of necessary connection flanges at the existing storage silos, all necessary distribution, dosing equipment (piping, valves etc.), and piping for distribution to both silo 1 and 2.	E	Existing end product silo 1 and 2	A15.2
Reagents							
M16	Urea	Connection point at existing urea storage tank.	E	Existing urea storage tank.	C	The Works shall include all necessary works for connection to the existing forward pipe from the existing tank including but not limited to establishment of necessary connections, all distribution, dosing equipment (piping, valves etc.), preparation devices and piping. Connection point shall be close to the existing urea tank.	A15.1
M17	Activated Carbon	(Base scope, if Option 3 is not chosen) Connection point at existing activated carbon storage system.	E	Existing activated carbon storage system.	C	The Works shall include all necessary works for connection to the existing storage system including but not limited to establishment of necessary connection flanges at the existing storage system, all necessary distribution, dosing equipment (piping, valves etc.), preparation devices and piping.	A15.2

ID	Medium	Description	Sending	Scope of Works	Receiving	Scope of Works	Concept diagram
M18	Activated Carbon	(If Option 3 is chosen) Receiving of big-bags.	E	Big-bags delivered at ground level 0,00 m.	C	Receiving, lifting and handling equipment for big-bags.	A15.2
M19	Quick lime CaO	(If quick lime chosen as reagent and Option 4 is not chosen) Connection point at existing quick lime storage tank.	E	Existing quick lime storage tank.	C	The Works shall include all necessary works for connection to the existing silo including but not limited to establishment of necessary connection flanges at the existing storage silos, all necessary distribution, dosing equipment (piping, valves etc.), preparation devices and piping.	A15.2
M20	Quick lime CaO	(If quick lime chosen as reagent and Option 4 is chosen) Receiving Connection for transport from silo truck to storage silo.	E	Standard delivery truck equipped with compressor for fluidization and transport into the silo.	C	Inlet connection to filling pipe to silo.	A15.2
M21	Hydrated lime Ca(OH) ₂	(If hydrate lime chosen as reagent) Receiving connection for transport from silo truck to storage silo at unloading area.	E	Standard delivery truck equipped with compressor for fluidization and transport into the silo.	C	Inlet connection to filling pipe to to silo.	A15.2
Utilities							
M22	Natural gas	Connection point at existing distribution pipe upstream existing main gas shut-off valve.	E	Existing gas distribution pipe.	C	Establishment of flange on distribution pipe upstream existing main gas shut-off valve for the Existing facility. Connection to flange, establishment of main gas shut-off valve for the Line (Line K1), piping, gas meter and all related Works.	
District heating							
M23	DH water – return	Connection point for DH return water downstream Employer's existing DH pumps and	E	Shut-off valve inside existing DH station and empty pipe section for DH return water 1 meter	C	Welded connection to pipe and all related Works.	A15.3

ID	Medium	Description	Sending	Scope of Works	Receiving	Scope of Works	Concept diagram
		absorption heat pump for component cooling.		outside the façade of the Employer's existing DH station.			
M24	DH water - forward	Connection point for DH forward water upstream Employer's existing DH condensers.	C	Welded connection to pipe and all related Works.	E	Shut-off valve inside existing DH station and empty pipe section for DH forward water 1 meter outside the façade of the Employer's existing DH station.	A15.3
Steam							
M25	Live steam	Safety valve for blow-out of live steam.	C	Safety valve arrangement located below roof with pipe connection over roof.	NA		
M26	Live steam	Start-up safety valve for blow-out of live steam during start-up.	C	Start-up safety valve arrangement located below roof with pipe connection over roof.	NA		
M27	Extraction steam (Option 1)	(If option 1 is chosen and extraction steam used as driving force for heat pump) 11.5 bara steam from Employer's existing extraction turbine to heat pump of Line.	E	Shut-off valve and outlet DN200 flange on Employer's existing 11.5 bar(a) steam distributor.	C	Connection to flange, piping and all related Works.	
Condensate							
M28	Condensate (Option 1)	(If option 1 is chosen and extraction steam used as driving force for heat pump) Condensate from heat pump return to Employer's existing atmospheric condensate tank for EfW Line K2 and K3.	C	Connection to flange, piping and all related Works.	E	Inlet flange and shut-off valve on Employer's existing atmospheric condensate tank.	

ID	Medium	Description	Sending	Scope of Works	Receiving	Scope of Works	Concept diagram
M29	Condensate (Option 1)	Treated condensate from the flue gas condensation to be reused in the Employer's EfW Line K2 and K3.	C	Shut-off valve and outlet flange located inside the new Line FGT hall. Piping and all related Works included.	E	Connection to flange and all related works.	A15.4
Cleaned flue gas							
M30	Cleaned flue gas	Connection to existing stack.	C	Removal of existing flue gas pipe in existing stack and installation of new flue gas pipe inside the existing stack, including related equipment such as flanges, fixtures, drains, internal access, electrical, insulation, droplet separator and safeguard against droplet fallout and all related Works included.	E	Existing stack concrete structure .	A15.2

3. LIMITS OF SUPPLY FOR ELECTRICAL EQUIPMENT

No	Description	Party	Scope of Works	Party	Scope of Works
E1	Extension of existing switchboard R2 WA4 (22 kV)	E	Existing switchboard R2 WA4 (22 kV) made available for Contractor.	C	Extension of existing switchboard R2 WA4 (22 kV) with two sections with - Circuit breaker for normal operation transformer T24 - Circuit breaker for normal operation transformer T25

4. LIMITS OF SUPPLY FOR CMS

No	Description	Party	Scope of Works	Party	Scope of Works
CMS1	Design basis planning and co-ordination	C	Accountable for the main planning, coordination, and summary of the common design basis concerning the overall CMS deliveries (e.g. common standard library for CMS typical as basis for controller programming and interface standard for serial communication between process stations and intelligent equipment and object-module library, faceplates and report layout for HMI etc.)	E	Participation in coordination meetings. Bringing their needs and requirements, review plans and documents and be active in coordination.
CMS2	CMS system for Complete Line	C	Delivery SPPA T3000 CMS system on level 1 and level 0, fully integrated with level 2 and level 3. All engineering, design, programming, implementation, etc., for fully functional and operating system on all levels (including level 2 and level 3) including all necessary license for implementing of the Line.	E	Delivery (existing) SPPA T3000 CMS system on level 2 and level 3, upgraded to newest version, minimum SPPA-T3000 Release R8.2.SP2.
CMS3	CMS system; Hardware supply limit on the two existing Automation Highway switches.	C	Connection with redundant optical fiber cable connections to the two existing Automation Highway switches.	E	Delivery of (existing) two optical Automation Highway switches. 1) 0CRU01.A07 SCALANCE X212-2 2) 0CRU01.A08 SCALANCE X212-2
CMS4	Connection of Employer's existing CCTV cameras to CCTV switches.	C	Delivery and installation of CCTV switches for connection of Employer's Existing CCTV cameras (See Appendix E4 <i>Specifications for Employer's existing CCTV System</i>).	E	Existing CCTV camera system (See Appendix E4 <i>Specifications for Employer's existing CCTV System</i>).
CMS5	CEMS: Supply limit towards existing CEMS	C	Delivery of new CEMS and connection to existing CMS system SPPA T3000 and SCADA system "StoneBase".	E	Extension of existing SCADA system "StoneBase".

			See Appendix E9 <i>Specifications for Employer's CEMS</i> for topology diagram and visual supply limit.		
CMS6	Signal exchange between existing reception hall equipment and new crane control system	C	Necessary signal exchange (including cabling and connections) between existing waste reception equipment and the Line CMS and the crane control system.	E	Existing traffic lights and bay load gates.
CMS7	Signal exchange of compressed air for the Line	C	Necessary signal exchange between existing compressed air equipment and the Line.	E	Existing compressed air system.
CMS8	Signal exchange for existing silos	C	Necessary signal exchange between existing silos/storage tanks and the Line.	E	Existing silos and tanks.

5. LIMITS OF SUPPLY FOR CIVIL WORKS (BUILDINGS)

No	Description	Party	Scope of Works	Party	Scope of Works
B1	Summer cooler support steel structure on top of the existing waste sorting hall	E	Existing roof of waste sorting hall.	C	Support steel structure including steel base frame including columns and bracings and foundations and all related Works.
B2	DH piping in gangway pipe bridge (If Contractor utilizes gangway between Employer's administration building and Existing facility for DH piping)	E	Existing gangway.	C	DH piping and related equipment including reinforcement of gangway if used and all related Works.
Bx	Refer to Appendix A9 <i>Technical Specifications for Building</i> for additional limits of supply related to civil works.				