



Generic Scope of Work

**Matimba Power
Station**

Title: **The Maintenance of Ducting,
Dampers and Tubular Air
Heaters at Matimba Power
Station.**

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1. INTRODUCTION

The six (6) boiler units at Matimba Power Station mainly comprises of three (3) plant areas within the draught plant (also denoted as draught group). Namely, primary air, secondary air and flue gas flow systems.

All the associated ducting, dampers and tubular air heaters, within the draught plant, requires scheduled maintenance, as prescribed in the plant maintenance philosophy or strategy. Maintenance execution on the ducting, dampers and tubular air heaters is typically done during planned outages. Failure to conduct scheduled maintenance directly results in the station failing to achieve its performance targets such as EAF (>70% YTD), etc.

Therefore, there is a need to have a contract in place for the maintenance of ducting, dampers and tubular air heaters at Matimba Power Station, to achieve operational sustainability and performance within the primary air, secondary air and flue gas flow systems.

2. SUPPORTING CLAUSES

2.1 SCOPE

The maintenance of ducting (i.e. Primary Air, Secondary Air and Flue Gas), dampers and tubular air heaters. The full scope of the maintenance services shall be performed in accordance with Section 3. The scope shall be performed during planned outages, and shall also be performed during opportunity maintenance where plant condition requires.

2.1.1 Purpose

The purpose of this document is to detail the scope of works and the quality requirements thereof/.

2.1.2 Applicability

This document shall apply to Matimba Power Station.

2.2 NORMATIVE/INFORMATIVE REFERENCES

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

- [1] ISO 9001 Quality Management Systems.
- [2] 32-1034 Procurement and Supply Chain Management Procedure.
- [3] ISO 14001 Environment

2.2.2 Informative

- [4] Tender Technical Evaluation Strategy.
- [5] Occupational Health and Safety (OHS) Act 85 of 193

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2.3 DEFINITIONS

Definition	Description
Primary Air System	Boiler system, made up of ducting and dampers, responsible for supply of primary air used to heat up the pulverised fuel (PF) in the mills and convey combination of Air/PF to the burners.
Secondary Air System	Boiler system, made up of ducting and dampers, responsible for supply of secondary air, through the burners, to support total combustion in the boiler furnace.
Flue Gas System	Boiler system, made up of ducting and dampers, responsible for the removal of flue gas from the boiler after combustion has taken place.
Tubular Air Heaters	A recuperative heat exchanger used to transfer heat from flue gas to primary air.
Draught Plant Maintenance philosophy or Strategy	A comprehensive set of maintenance approaches, used as a maintenance blueprint, designed to minimise down time and optimise operational performance for the draught plant.

2.3.1 Disclosure Classification

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

2.4 ABBREVIATIONS

Abbreviation	Description
EAF	Energy Availability Factor
ISO	International Organisation of Standardization
YTD	Year to date

2.5 ROLES AND RESPONSIBILITIES

Contractor - Shall be responsible for the provision of the services as required by Eskom and stipulated in Section 3.

2.6 PROCESS FOR MONITORING

To ensure that the quality of the maintenance services meet the required specification, all maintenance activities conducted shall be inspected upon completion by maintenance personnel who is familiar with the scope, in most regard the artisan, and the Engineer.

2.7 RELATED/SUPPORTING DOCUMENTS

[1] Tender Technical Evaluation Strategy

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3. DETAILED SCOPE

3.1 DUCTING AND DAMPERS

COMPONENT ACTIVITIES											Outage Type			
No	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	Ref. BOM item (№ from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICATION	Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units				
1.		Primary air ducting	1. NOTE:1 2. Window patch ducting, damper and turning vane areas where the thickness goes below the following: 12 mm – min. 8mm 8mm - min. 5 mm 6mm - min. 3mm As in procedure 240-56241933 Repair by welding (butter-up) or doubling plate can be considered, depending on the condition and total area. All repairs will be discussed and decided on in resolution meetings, chaired by the outage co-ordinator.		240-56241933			Contractor			X	X	X	X
1.1.	HLA	All PA ducting -from suction at 113m/l to mill inlet -hangers and leg supports	Inspect mechanical condition and hanger position. Report on the condition of the hangers and leg supports to be submitted to Engineering. (Inspect all ducting supports and Report)		Report to be submitted to engineering	H		Contractor	Each	1	X	X	X	X
1.2.	HLA	All PA ducting -from suction at 113m/l to mill inlet -hangers and leg supports	Replace all hanger supports required due to damage. Calibrate hanger supports where necessary.						Each	20	X	X	X	X
1.3.	HLA	All PA ducting -from suction at 113m/l to mill inlet -hangers and leg supports	Replace all shoe or leg supports required						Each	10	X	X	X	X
											X	X	X	X
1.4.	HLA35/45 HLA32/42 HLA31/41 HLA30/40	1) Suction duct - from PA / FD suction split to PA fans	External and internal visual inspection for defects such as distortion and mechanical damage.		Report to be submitted to engineering			Contractor	Each	1	X	X	X	X
		2) PA fan discharge duct to tubular air heater inlet	Inspect wall thickness (see note 1 above). Report of wall thickness to be submitted to engineering.						Each	1	X	X	X	X
CONTROLLED DISCLOSURE														

COMPONENT ACTIVITIES											Outage Type			
No	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	Ref. BOM item (No from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICATION	Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units	IN	IR	MO	GO
		3) PA ducting from tubular air heater to mills	For window patching repair: Cut the duct section out						m^2	1	X	X	X	X
			For window patching repair: Manufacture a new window patch						m^2	1	X	X	X	X
			For window patching repair: Install window patch by means of seal welding						m	10	X	X	X	X
			For double plating repair Manufacture the double plating section						m^2	1	X	X	X	X
			For double plating repair Install the double plate by means of seal welding						m	10	X	X	X	X
			Repair by means of re-welding						m	20	X	X	X	X
											X	X	X	X
1.5.		PA fan and duct isolating dampers									X	X	X	X
	HLA35/45AA001 HLA32/42AA001 HLA31/41AA001	1) RH & LH PA fan inlet damper	Inspect the isolating dampers for wear and distortion			W		Contractor	Each	8	X	X	X	X
		2) RH & LH PA fan outlet damper	If damper is unrepairable, manufacture a new damper			R		Contractor, C&I, P&T, MMD and Engineer (if available)	Each	2	X	X	X	X
		3) RH & LH Tubular Air heater outlet damper	(* includes removing and replacing the damper)											
		4) RH & LH Tubular Air heater bypass damper	Repair all the damaged dampers.						m^2	4	X	X	X	X
			For window patching repair: Cut the damaged damper section out											
			For window patching repair: Manufacture a new damper section window patch						m^2	4	X	X	X	X
			For window patching repair: Install window patch by means of seal welding						m	20	X	X	X	X
			Inspect & tighten all the ball joints						Each	16	X	X	X	X
			Replace all the damaged ball joints						Each	16	X	X	X	X

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COMPONENT ACTIVITIES											Outage Type			
No	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	Ref. BOM item (No from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICATION	GOVERNING DOCUMENTS		ACTION			IN	IR	MO	GO
			Do functional checks including links operation and ensure open and closing positions are correct (part of commissioning).						Each	8	X	X	X	X
			check actuator condition - look for signs of grease leakage and wear on actuator drive / revolving nut.						Each	8	X	X	X	X
			Also do stroke checking						Each	8	X	X	X	X
			Damper shafts glands packing: Replace all the damper shafts glands packing.						Each	8	X	X	X	X
			End shafts gaskets: Replace all the end shafts gaskets.						Each	16	X	X	X	X
											X	X	X	X
1.4.		PA fan supple joint									X	X	X	X
	HLA	1) PA fan outlet supple joint (LH & RH)	Inspect the PA fan outlet supple joints and repair/patch if minor damaged. (Supple joints must not be patched if severely damaged, Engineering to approve before repair is performed)						Each	2	X	X	X	X
			Inspect the PA fan outlet and inlet supple joints and replace if found damaged.						Each	2	X	X	X	X
											X	X	X	X
2.		FD fan dampers and supple joints									X	X	X	X
2.1	HHL & HLA	1) FD fan outlet supple joint (LH and RH) 2) FD fan inlet supple joints located in the wind boxes (LH and RH)	Inspect the FD fan supple joints and repair/patch if minor damaged. (Supple joints must not be patched if seriously damaged, Engineering to approve before repair is performed)			W		Contractor	Each	4	X	X	X	X
			Inspect the FD fan supple joints and replace if found damaged.						Each	4	X	X	X	X
2.2	HHL & HLA	1) FD Fan Inlet Isolating damper (LH and RH) 2) Secondary Air heater outlet	Inspect the isolating dampers for wear and distortion If damper is unrepairable, manufacture a new damper (* includes removing and replacing the damper)						Each	4	X	X	X	X
									Each	2	X	X	X	X
CONTROLLED DISCLOSURE														

COMPONENT ACTIVITIES											Outage Type			
						GOVERNING DOCUMENTS		ACTION						
No	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	Ref. BOM item (No from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICATION	Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units	IN	IR	MO	GO
		damper (LH and RH)												
			Repair all the damaged dampers.						M^2	2	X	X	X	X
			For window patching repair: Cut the damaged damper section out											
			For window patching repair: Manufacture a new damper section window patch						M^2	2	X	X	X	X
			For window patching repair: Install window patch by means of seal welding						m	10	X	X	X	X
			Inspect & tighten all the ball joints						Each	8	X	X	X	X
			Replace all the damaged ball joints						Each	8	X	X	X	X
			Do functional checks including links operation and ensure open and closing positions are correct (part of commissioning).						Each	4	X	X	X	X
			check actuator condition - look for signs of grease leakage and wear on actuator drive / revolving nut.						Each	4	X	X	X	X
			Also do stroke checking						Each	4	X	X	X	X
			Damper shafts glands packing: Replace all the damper shafts glands packing.						Each	4	X	X	X	X
			End shafts gaskets: Replace all the end shafts gaskets.						Each	8	X	X	X	X
											X	X	X	X
3		Secondary air ducts									X	X	X	X
3.1	HHL & HLA	Secondary air ducts	3. NOTE 2 4. Window patch ducting, damper and turning vane wear areas where the thickness goes below the following: 12mm – min 8mm 8mm - min 5mm 6mm - min 3mm Repair by welding (butter-up) or window patching can be considered, depending on the		240-56241933			Contractor			X	X	X	X

CONTROLLED DISCLOSURE

COMPONENT ACTIVITIES											Outage Type			
						GOVERNING DOCUMENTS		ACTION						
Nº	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	Ref. BOM item (Nº from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICATION	Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units	IN	IR	MO	GO
			location and total area. All repairs will be discussed and decided on in resolution meetings, chaired by the outage co-ordinator											
3.2	HHL & HLA	All secondary air ducting - from suction at 113m/l to burner corners - hangers and supports	Inspect mechanical condition and hanger position. Report on the condition of the hangers and leg supports to be submitted to Engineering. (Inspect all ducting supports and Report)		Report to be submitted to engineering			Contractor	Each	1	X	X	X	X
3.2.1	HHL & HLA	All secondary air ducting - from suction at 113m/l to burner corners - hangers and supports	Replace all hanger supports required due to damage. Calibrate hanger supports where necessary.						Each	20	X	X	X	X
3.2.2	HHL & HLA	All secondary air ducting - from suction at 113m/l to burner corners - hangers and supports	Replace all shoe or leg supports required						Each	10	X	X	X	X
3.3	HHL & HLA	1) FD Suction duct at 113 m LVL- to FD/PA duct split - to FD fan inlet 2) FD fan outlet to secondary air heaters 3) Ducting from secondary air heater outlet to burners corners	External and internal visual inspection for defects such as distortion and mechanical damage. Inspect wall thickness (see note 1 above). Report of wall thickness to be submitted to engineering. For window patching repair: Cut the duct section out For window patching repair: Manufacture a new window patch For window patching repair: Install window patch by means of seal welding For double plating repair Manufacture the double plating section For double plating repair Install the double plate by means of seal welding						Each	1	X	X	X	X
									Each	1	X	X	X	X
									M^2	150	X	X	X	X
									M^2	150	X	X	X	X
									m	5000	X	X	X	X
									M^2	100	X	X	X	X
									m	3000	X	X	X	X
3.4	HHL & HLA		Inspect the turning vanes (all) at 46 ml for damages.			W		Contractor	Each	1	X	X	X	X

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						GOVERNING DOCUMENTS		ACTION						
№	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	Ref. BOM item (No from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICATION	Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units	IN	IR	MO	GO
		secondary air heater outlet to burners corners	Inspect wall thickness (see note 1 above). Report of wall thickness to be submitted to engineering											
		- Turning vanes	For window patching repair: Cut the turning vane section out						M^2	100	X	X	X	X
			For window patching repair: Manufacture a new window patch						M^2	100	X	X	X	X
			For window patching repair: Install window patch by means of seal welding on turning vane						m	3000	X	X	X	X
3.5	HHL & HLA	(Distribution box) Secondary air heater outlet ducting to A mill burner corner x4	clean ash build-up, and inspect the expansion joints for wear, distortion and cracks. (Report to Engineering)			H		Contractor and System engineer	Each	40	X	X	X	X
		-All expansion joints on each duct (2 off in A Mill horizontal) (2 off in A Mill Upper Vertical) (6 Off in A Mill Burner Corner)	Repair/patch expansion joints if minor damaged. The expansions that are damaged need to be fitted with a skirt plate over the damaged areas. (Expansion joints must not be patched if severely damaged, Engineering to approve before repair is performed)						Each	40	X	X	X	X
			Replace expansion joints if severely damaged. Method statement to be submitted to the system engineer to determine how to support the duct during replacement.						Each	40	X	X	X	X
3.6	HHL & HLA	(Distribution box) Secondary air heater outlet ducting to B mill burner corner x4	clean ash build-up, and inspect the expansion joints for wear, distortion and cracks. (Report to Engineering)			H		Contractor and System engineer	Each	40	X	X	X	X
		-All expansion joints on each duct (2 off in B Mill horizontal) (2 off in B Mill Upper Vertical) (6 Off in B Mill Burner Corner)	Repair/patch expansion joints if minor damaged. The expansions that are damaged need to be fitted with a skirt plate over the damaged areas. (Expansion joints must not be patched if severely damaged,						Each	40	X	X	X	X

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						Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units				
3.7	HHL & HLA	(Distribution box) Secondary air heater outlet ducting to C mill burner corner x4 -All expansion joints on each duct (2 off in C Mill horizontal) (2 off in C Mill Upper Vertical) (6 Off in C Mill Burner Corner)	Engineering to approve before repair is performed)											
			Replace expansion joints if severely damaged. Method statement to be submitted to the system engineer to determine how to support the duct during replacement.						Each	40	X	X	X	X
			clean ash build-up, and inspect the expansion joints for wear, distortion and cracks. (Report to Engineering)			H		Contractor and System engineer	Each	40	X	X	X	X
			Repair/patch expansion joints if minor damaged. The expansions that are damaged need to be fitted with a skirt plate over the damaged areas. (Expansion joints must not be patched if severely damaged, Engineering to approve before repair is performed)						Each	40	X	X	X	X
3.8	HHL & HLA	(Distribution box) Secondary air heater outlet ducting to D mill burner corner x4 -All expansion joints on each duct (2 off in D Mill horizontal) (2 off in D Mill Upper Vertical) (6 Off in D Mill Burner Corner)	Replace expansion joints if severely damaged. Method statement to be submitted to the system engineer to determine how to support the duct during replacement.						Each	40	X	X	X	X
			clean ash build-up, and inspect the expansion joints for wear, distortion and cracks. (Report to Engineering)			H		Contractor and System engineer	Each	40	X	X	X	X
			Repair/patch expansion joints if minor damaged. The expansions that are damaged need to be fitted with a skirt plate over the damaged areas. (Expansion joints must not be patched if severely damaged, Engineering to approve before repair is performed)						Each	40	X	X	X	X

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COMPONENT ACTIVITIES											Outage Type			
						GOVERNING DOCUMENTS		ACTION						
№	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	Ref. BOM item (No from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICATION	Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units	IN	IR	MO	GO
			Replace expansion joints if severely damaged. Method statement to be submitted to the system engineer to determine how to support the duct during replacement.						Each	40	X	X	X	X
3.9	HHL & HLA	(Distribution box) Secondary air heater outlet ducting to E mill burner corner x4	clean ash build-up, and inspect the expansion joints for wear, distortion and cracks. (Report to Engineering)			H		Contractor and System engineer	Each	40	X	X	X	X
		-All expansion joints on each duct (2 off in E Mill horizontal) (2 off in E Mill Upper Vertical) (6 Off in E Mill Burner Corner)	Repair/patch expansion joints if minor damaged. The expansions that are damaged need to be fitted with a skirt plate over the damaged areas. (Expansion joints must not be patched if severely damaged, Engineering to approve before repair is performed)						Each	40	X	X	X	X
			Replace expansion joints if severely damaged. Method statement to be submitted to the system engineer to determine how to support the duct during replacement.						Each	40	X	X	X	X
3.9	HHL & HLA	(Duct Sectional Replacement, including horizontal and vertical sections) Secondary air heater outlet system ducts to burners. - A-mill duct sections replacement (including flow venturis)	Inspect the secondary air system duct for wear and distortion and replace section of duct if severely damaged. Method statement to be submitted to the system engineer to determine how to support the duct during replacement.			W		Contractor	m	50	X	X	X	X
3.10	HHL & HLA	(Duct Sectional Replacement, including horizontal and vertical sections) Secondary air heater outlet system ducts to burners.	Inspect the secondary air system duct for wear and distortion and replace section of duct if severely damaged. Method statement to be submitted to the system engineer to						m	50	X	X	X	X

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		- B-mill duct sections replacement (including flow venturis)	determine how to support the duct during replacement.											
3.10	HHL & HLA	(Duct Sectional Replacement, including horizontal and vertical sections) Secondary air heater outlet system ducts to burners. - C-mill duct sections replacement (including flow venturis)	Inspect the secondary air system duct for wear and distortion and replace section of duct if severely damaged. Method statement to be submitted to the system engineer to determine how to support the duct during replacement.						m	50	X	X	X	X
3.10	HHL & HLA	(Duct Sectional Replacement, including horizontal and vertical sections) Secondary air heater outlet system ducts to burners. - D-mill duct sections replacement (including flow venturis)	Inspect the secondary air system duct for wear and distortion and replace section of duct if severely damaged. Method statement to be submitted to the system engineer to determine how to support the duct during replacement.						m	50	X	X	X	X
3.10	HHL & HLA	(Duct Sectional Replacement, including horizontal and vertical sections) Secondary air heater outlet system ducts to burners. - E-mill duct sections replacement (including flow venturis)	Inspect the secondary air system duct for wear and distortion and replace section of duct if severely damaged. Method statement to be submitted to the system engineer to determine how to support the duct during replacement.						m	50	X	X	X	X
3.11	HHL & HLA	Secondary air flow venturis A-E Mills	Inspect and unblock the impulse lines (All) from 43 to 68 meters LVL.			W		MMD & C&I and Contractor	Each	1	X	X	X	X
											X	X	X	X

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						Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units				
4		Secondary air duct to Regulating dampers									X	X	X	X
4.1	HHL11AA001 HHL12AA001 HHL13AA001 HHL14AA001 HHL15AA001 HHL21AA001 HHL22AA001 HHL23AA001 HHL24AA001 HHL25AA001 HHL31AA001 HHL32AA001 HHL33AA001 HHL34AA001 HHL35AA001 HHL41AA001 HHL42AA001 HHL43AA001 HHL44AA001 HHL45AA001	1) LVL 1 BNR 1 Secondary air regulating damper	Inspect the regulating dampers for wear and distortion			W		Contractor	Each	240	X	X	X	X
		2) LVL 2 BNR 1 Secondary air regulating damper	If damper is unrepairable, manufacture a new damper (* includes removing and replacing the damper)					C&I, P&T, MMD and Engineer(if available)	Each	50	X	X	X	X
		3) LVL 3 BNR 1 Secondary air regulating damper	Repair all the damaged dampers.			W		Contractor	M^2	500	X	X	X	X
		4) LVL 4 BNR 1 Secondary air regulating damper	For window patching repair: Cut the damaged damper section out											
		5) LVL 5 BNR 1 Secondary air regulating damper	For window patching repair:						M^2	500	X	X	X	X
		6) LVL 1 BNR 2 Secondary air regulating damper	Manufacture a new damper section window patch											
		7) LVL 2 BNR 2 Secondary air regulating damper	For window patching repair:						m	3000	X	X	X	X
		8) LVL 3 BNR 2 Secondary air regulating damper	Install window patch by means of seal welding. Ensure a minimum distance of 6 mm between any doubling plate/welding and damper plates.											
		9) LVL 4 BNR 2 Secondary air regulating damper	Inspect & tighten all the ball joints						Each	480	X	X	X	X
		10) LVL 5 BNR 2 Secondary air regulating damper	Replace all the damaged ball joints						Each	480	X	X	X	X
		11) LVL 1 BNR 3 Secondary air regulating damper	Replace all the damaged ball joints on all secondary air dampers. If any swivel joint has a free play of > 0,1 mm, it must be replaced if it cannot be tightened. Welding on the swivel joints is not permitted.											
		12) LVL 2 BNR 3 Secondary air regulating damper												
		13) LVL 3 BNR 3 Secondary air regulating damper	Do functional checks including links operation and ensure open and closing positions are correct (part of commissioning).						Each	240	X	X	X	X
		14) LVL 4 BNR 3 Secondary air regulating damper	check actuator condition - look for signs of grease leakage and wear on actuator drive / revolving nut.											
		15) LVL 5 BNR 3 Secondary air regulating damper												
		16) LVL 1 BNR 4 Secondary air regulating damper	Also do stroke checking						Each	240	X	X	X	X
			Damper shafts glands packing: Replace all the damper shafts glands packing.						Each	240	X	X	X	X
				CONTROLLED DISCLOSURE										

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						Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units				
		17) LVL 2 BNR 4 Secondary air regulating damper 18) LVL 3 BNR 4 Secondary air regulating damper 19) LVL 4 BNR 4 Secondary air regulating damper 20) LVL 5 BNR 4 Secondary air regulating damper	End shafts gaskets: Replace all the end shafts gaskets.						Each	480	X	X	X	X
											X	X	X	X
5		Secondary air isolating dampers									X	X	X	X
5.1	HHL11AA101 HHL12AA101 HHL13AA101 HHL14AA101 HHL15AA101 HHL21AA101 HHL22AA101 HHL23AA101 HHL24AA101 HHL25AA101 HHL31AA101 HHL32AA101 HHL33AA101 HHL34AA101 HHL35AA101 HHL41AA101 HHL42AA101 HHL43AA101 HHL44AA101 HHL45AA101	1) LVL 1,2,3,4,5 BNR 1,2,3,4 damper 1 Secondary air isolating damper	Inspect the isolating dampers for wear and distortion			W		Contractor	Each	20	X	X	X	X
			If damper is unrepairable, manufacture a new damper (* includes removing and replacing the damper)			W		Contractor	Each	10	X	X	X	X
		2) LVL 1,2,3,4,5 BNR 1,2,3,4 damper 2 Secondary air isolating damper	Repair all the damaged dampers.			W		Contractor	M^2	100	X	X	X	X
			For window patching repair: Cut the damaged damper section out											
		3) LVL 1,2,3,4,5 BNR 1,2,3,4 damper 3 Secondary air isolating damper	For window patching repair:			W		Contractor	M^2	100	X	X	X	X
			Manufacture a new damper section window patch											
		4) LVL 1,2,3,4,5 BNR 1,2,3,4 damper 4 Secondary air isolating damper	For window patching repair:						m	3000	X	X	X	X
			Install window patch by means of seal welding. Ensure a minimum distance of 6 mm between any doubling plate/welding and damper plates.											
		5) LVL 1,2,3,4,5 BNR 1,2,3,4 damper 5 Secondary air isolating damper	Inspect & tighten all the ball joints						Each	40	X	X	X	X
			Replace all the damaged ball joints						Each	40	X	X	X	X
			Replace all the damaged ball joints on all secondary air dampers. If any swivel joint has a free play of > 0,1 mm, it must be replaced if it cannot											

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						Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units				
	HHL35AA201 HHL41AA201 HHL42AA201 HHL43AA201 HHL44AA201 HHL45AA201		be tightened. Welding on the swivel joints is not permitted.											
	HHL11AA301 HHL12AA301 HHL13AA301 HHL14AA301 HHL15AA301 HHL21AA301 HHL22AA301 HHL23AA301 HHL24AA301 HHL25AA301 HHL31AA301 HHL32AA301 HHL33AA301 HHL34AA301 HHL35AA301 HHL41AA301 HHL42AA301 HHL43AA301 HHL44AA301 HHL45AA301		Do functional checks including links operation and ensure open and closing positions are correct (part of commissioning).						Each	20	X	X	X	X
			check actuator condition - look for signs of grease leakage and wear on actuator drive / revolving nut.											
			Also do stroke checking						Each	20	X	X	X	X
			Damper shafts glands packing: Replace all the damper shafts glands packing.						Each	20	X	X	X	X
			End shafts gaskets: Replace all the end shafts gaskets.						Each	40	X	X	X	X
	HHL11AA401 HHL12AA401 HHL13AA401 HHL14AA401 HHL15AA401 HHL21AA401 HHL22AA401 HHL23AA401 HHL24AA401 HHL25AA401 HHL31AA401 HHL32AA401 HHL33AA401 HHL34AA401 HHL35AA401 HHL41AA401 HHL42AA401 HHL43AA401 HHL44AA401 HHL45AA401													
	HHL11AA501 HHL12AA501 HHL13AA501 HHL14AA501													

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	HHL15AA501 HHL21AA501 HHL22AA501 HHL23AA501 HHL24AA501 HHL25AA501 HHL31AA501 HHL32AA501 HHL33AA501 HHL34AA501 HHL35AA501 HHL41AA501 HHL42AA501 HHL43AA501 HHL44AA501 HHL45AA501													
5.2		Fuel oil burner boxes (corner 1 to 4)	Inspect fuel oil burner boxes LVL 1 to 5 and repair the damages.						Each	20	X	X	X	X
											X	X	X	X
6		Cross-over duct									X	X	X	X
6.1	HHL01	Cross-over duct	Inspect the cross-over duct for cracks. Do MPI inspection on all welds, including the hanger support to ducting welds. (Report to be submitted)			W		Contractor	Each	1	X	X	X	X
			Repair cross-over duct cracks through welding.						m	2000	X	X	X	X
			If any repairs need to be done on the duct where the hanger support joint the duct. Then a detailed plan (report) on how to support the duct need to be submitted to the system engineer. Repair hanger support joint as required						Each	8	X	X	X	X
6.2	HHL01	Cross-over duct	Calibrate and adjust the hanger supports on the cross- over duct. Method statement to be submitted to engineering.		Method statement to be submitted to engineering	W		Contractor	Each	8	X	X	X	X
											X	X	X	X

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7		Distribution boxes									X	X	X	X
7.1	HHL	A-E Mill duct I beams (horizontal ducting internal support)	Cut and replace buckled or bent I beam supports inside A-E mill horizontal ducting from square to round nozzle of distribution box.						Each	40	X	X	X	X
8		Core air dampers & Secondary air regulating dampers									X	X	X	X
8.1	HLA11AA001 HLA21AA001 HLA12AA001 HLA22AA001	1) RH & LH cold air regulating damper 2) RH & LH warm air regulating damper	Inspect the regulating dampers for wear and distortion			W		Contractor	Each	4	X	X	X	X
			If damper is unrepairable, manufacture a new damper (* includes removing and replacing the damper)			W		C&I, P&T, MMD and Engineer (if available)	Each	4	X	X	X	X
			Repair all the damaged dampers. For window patching repair: Cut the damaged damper section out						M^2	5	X	X	X	X
			For window patching repair: Manufacture a new damper section window patch						M^2	5	X	X	X	X
			For window patching repair: Install window patch by means of seal welding. Ensure a minimum distance of 6 mm between any doubling plate/welding and damper plates.						m	100	X	X	X	X
			Inspect & tighten all the ball joints						Each	8	X	X	X	X
			Replace all the damaged ball joints Replace all the damaged ball joints on all secondary air dampers. If any swivel joint has a free play of > 0,1 mm, it must be replaced if it cannot be tightened. Welding on the swivel joints is not permitted.						Each	8	X	X	X	X
			Do functional checks including links operation and ensure open and closing positions are correct (part of commissioning).						Each	4	X	X	X	X

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			check actuator condition - look for signs of grease leakage and wear on actuator drive / revolving nut.											
			Also do stroke checking						Each	4	X	X	X	X
			Damper shafts glands packing: Replace all the damper shafts glands packing.						Each	4	X	X	X	X
			End shafts gaskets: Replace all the end shafts gaskets.						Each	8	X	X	X	X
											X	X	X	X
9		Primary steam Air Preheaters									X	X	X	X
9.1	HLC01AC001 HLC01AC001 HLC01AC001	Primary air steam air preheaters	Open, clean and inspect the main steam air preheater for leaks and repair.			W		MMD and Contractor	Each	1	X	X	X	X
9.2			Pressure test the Primary steam air pre-heater. This is a statutory requirement - make sure it is on the list of boiler items for pressure testing. If Repairs were done the pressure test must be done after repairs.		PWM/HLCAC/M/002	W		MMD and Contractor	Each	1	X	X	X	X
9.3			Check if All the gauges and transmitters are calibrated. C&I function			W		C&I, MMD	Each	1	X	X	X	X
											X	X	X	X
10		Fuel Gas Ducting									X	X	X	X
											X	X	X	X
10.1	HNA	All flue gas ducting-from economiser outlet to air heater outlet - hangers and supports	Inspect mechanical condition and hanger position. Report on the condition of the hangers and leg supports to be submitted to Engineering. (Inspect all ducting supports and Report)		Report to be submitted to engineering	W		Contractor	Each	1	X	X	X	X
10.1.1	HNA	All flue gas ducting-from economiser outlet to air heater outlet - hangers and supports	Replace all hanger supports required due to damage. Calibrate hanger supports where necessary.						Each	20	X	X	X	X
10.1.1	HNA	All flue gas ducting-from economiser outlet to air	Replace all shoe or leg supports required						Each	10	X	X	X	X

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						Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units				
		heater outlet - hangers and supports												
10.2	HNA	Boiler outlet to bifurcation inlet									X	X	X	X
10.2.1	HNA13/23	Boiler outlet to bifurcation inlet (Lobster back)	Inspect flue gas ducting from Boiler outlet (Reheater) to economiser, for distortion & cracks. <i>Look-for water marks on the duct, rope may be needed to inspect.</i>		<i>Report to be submitted to engineering</i>	W		Contractor	Each	1	X	X	X	X
			<i>Repair the areas that are distorted or cracked through welding (including expansion joints).</i>						m	25	X	X	X	X
10.2.2			Use rope access for inspection of flange D. MPI both the bridging pieces & repair.			W		Contractor	m	25	X	X	X	X
10.2.3			Inspect the ducting circumferential welds at economiser top bank (between the economiser casing and lobster back) and weld repair.			W		Contractor	m	25	X	X	X	X
10.2.4			Final inspection			W		System Engineer, Contractor and Engineer (if available) must be available	Each	1	X	X	X	X
											X	X	X	X
11		Bifurcation Inlet to Tubular and Rotary air heater Inlet									X	X	X	X
11.1	HNA14 HNA24 HNA16 HNA26	Bifurcation inlet to tubular and rotary air heater inlet	Inspect the ducting for high wear areas. Inspect wall thickness (see note 1 above). Report of wall thickness to be submitted to engineering.			W		Contractor	Each	1	X	X	X	X
			Open the skit plates on the left- and right-hand walls to inspect.						Each	1	X	X	X	X
			Clean the expansion joint at the bifurcation inlet.						Each	1	X	X	X	X
			Repair the expansion joint at the bifurcation inlet. (If there is ash build-up of the sides, scaffolding to be built to remove all the skit plates and clean) low density mineral wool to be used to						Each	1	X	X	X	X

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			fill up the expansion joint before the skit plates are replaced											
			Inspect all the hinge joints for wear and distortion						Each	1	X	X	X	X
			Repair the damaged sections in the duct (high wear areas)						M^2	75	X	X	X	X
			For window patching repair: Cut the duct section out											
			For window patching repair: Manufacture a new window patch						M^2	75	X	X	X	X
			For window patching repair: Install window patch by means of seal welding						m	1000	X	X	X	X
			For double plating repair Manufacture the double plating section						M^2	20	X	X	X	X
			For double plating repair Install the double plate by means of seal welding						m	500	X	X	X	X
			MPI all the bridging pieces and repair						Each	1	X	X	X	X
11.6	HNA15AA001 HNA25AA001	Bifurcation RH & LH inlet to rotary air heater inlet damper	Inspect the dampers for wear and distortion			W		Contractor	Each	2	X	X	X	X
			If damper is unrepairable, manufacture a new damper			W		Contractor	Each	2	X	X	X	X
			(* includes removing and replacing the damper)											
			Repair all the damaged dampers.			W		C&I, MMD, P&T and Engineer (if available) must be available.	M^2	50	X	X	X	X
			For window patching repair: Cut the damaged damper section out											
			For window patching repair: Manufacture a new damper section window patch			W		System Engineer, Contractor and Engineer (if available) must be available	M^2	50	X	X	X	X
			For window patching repair: Install window patch by means of						m	500	X	X	X	X
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			seal welding. Ensure a minimum distance of 6 mm between any doubling plate/welding and damper plates.											
			Inspect & tighten all the ball joints						Each	4	X	X	X	X
			Replace all the damaged ball joints						Each	4	X	X	X	X
			Replace all the damaged ball joints on all secondary air dampers. If any swivel joint has a free play of > 0,1 mm, it must be replaced if it cannot be tightened. Welding on the swivel joints is not permitted.											
			Do functional checks including links operation and ensure open and closing positions are correct (part of commissioning).						Each	2	X	X	X	X
			check actuator condition - look for signs of grease leakage and wear on actuator drive / revolving nut.											
			Also do stroke checking						Each	2	X	X	X	X
			Damper shafts glands packing: Replace all the damper shafts glands packing.						Each	2	X	X	X	X
			End shafts gaskets: Replace all the end shafts gaskets.						Each	4	X	X	X	X
											X	X	X	X
12		Rotary air heater to m line									X	X	X	X
12.1	HNA15 HNA25	Rotary air heater to m line LH & RH.	Inspect the ducting floor, walls and roof for wear.			W		Contractor	Each	2	X	X	X	X
											X	X	X	X
			Repair the damages						M^2	50	X	X	X	X
			For window patching repair: Cut the damaged damper section out											
			For window patching repair: Manufacture a new section window patch						M^2	50	X	X	X	X
			For window patching repair: Install window patch by means of seal welding						m	500	X	X	X	X

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			For double plating repair Manufacture the double plating section						M^2	25	X	X	X	X
			For double plating repair Install the double plate by means of seal welding						m	200	X	X	X	X
			For seal strip repair: Remove sealing strip						m	100	X	X	X	X
			For seal strip repair: Cut/Manufacture sealing strip to size						m	50	X	X	X	X
			For seal strip repair: Install seal strips by means of seal welding						m	50	X	X	X	X
			For seal strip repair: re-welding of sealing strip (re-instating the weld)						m	50	X	X	X	X
12.2	HNA15/ HNA25	Rotary air heater to m line LH & RH turning vanes	Inspect all the bottom and top turning vanes. (Report to be submitted to Engineering).			W		Contractor	Each	2	X	X	X	X
			Repair the damages.								X	X	X	X
			For window patching repair: Cut the damaged damper section out.						M^2	100	X	X	X	X
			For window patching repair: Manufacture a new section window patch.						M^2	100	X	X	X	X
			For window patching repair: Install window patch by means of seal welding.						m	500	X	X	X	X
12.3	HNA15/ HNA25	Rotary air heater to m line LH & RH wall between turning vanes	Inspect the wall between the bottom and top turning vanes. Thickness test to be done to determine the thickness of the wall.		Thickness report	W		Contractor	Each	2	X	X	X	X
			Repair the damages								X	X	X	X
			For window patching repair: Cut the damaged damper section out						M^2	100	X	X	X	X
			For window patching repair: Manufacture a new section window patch						M^2	100	X	X	X	X

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			For window patching repair: Install window patch by means of seal welding						m	500	X	X	X	X
			For double plating repair Manufacture the double plating section						M^2	0	X	X	X	X
			For double plating repair Install the double plate by means of seal welding						m	0	X	X	X	X
12.4	HNA15/ HNA25	Rotary air heater to m line LH & RH skirt plates and expansion joints/bellows	Open the skirt plates on the floor for inspection.			W		Contractor	Each	2	X	X	X	X
			Remove the ash from the bellows at the floor and side walls and do inspection.			W		Contractor	Each	2	X	X	X	X
			Repair/patch expansion joints if minor damaged. (Expansion joints must not be patched if severely damaged, Engineering to approve before repair is performed)						Each	2	X	X	X	X
			Replace expansion joints if severely damaged. Method statement to be submitted to the system engineer to determine how to support the duct during replacement.						Each	2	X	X	X	X
			Close of the skirt plates after Final inspection acceptance			H		Contractor	Each	2	X	X	X	X
12.5	HNA25AA011 HNA15AA011	Rotary air heater to m line LH & RH dampers (air heater gas outlet damper)	Inspect the dampers for wear and distortion			W		Contractor	Each	2	X	X	X	X
			If damper is unrepairable, manufacture a new damper (* includes removing and replacing the damper)			W		C&I, MMD, P&T and Engineer (if available) must be available.	Each	2	X	X	X	X
			Repair all the damaged dampers. For window patching repair: Cut the damaged damper section out						M^2	50	X	X	X	X
			For window patching repair: Manufacture a new damper section window patch						M^2	50	X	X	X	X
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			For window patching repair: Install window patch by means of seal welding. Ensure a minimum distance of 6 mm between any doubling plate/welding and damper plates.						m	200	X	X	X	X
			Inspect & tighten all the ball joints						Each	4	X	X	X	X
			Replace all the damaged ball joints Replace all the damaged ball joints on all secondary air dampers. If any swivel joint has a free play of > 0,1 mm, it must be replaced if it cannot be tightened. Welding on the swivel joints is not permitted.						Each	4	X	X	X	X
			Do functional checks including links operation and ensure open and closing positions are correct (part of commissioning). check actuator condition - look for signs of grease leakage and wear on actuator drive / revolving nut.						Each	2	X	X	X	X
			Also do stroke checking						Each	2	X	X	X	X
			Damper shafts glands packing: Replace all the damper shafts glands packing.						Each	2	X	X	X	X
			End shafts gaskets: Replace all the end shafts gaskets.						Each	4	X	X	X	X
											X	X	X	X
13		M-line to precipitators									X	X	X	X
13.1	HNA26 HNA16	M-line to precipitators LH & RH	Inspect the duct for any wear and distortion			W		Contractor	Each	1	X	X	X	X
			Repair the damages For window patching repair: Cut the damaged damper section out						M^2	50	X	X	X	X
			For window patching repair: Manufacture a new section window patch						M^2	50	X	X	X	X

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			For window patching repair: Install window patch by means of seal welding						m	500	X	X	X	X
			For double plating repair Manufacture the double plating section						M^2	20	X	X	X	X
			For double plating repair Install the double plate by means of seal welding						m	100	X	X	X	X
			For seal strip repair: Remove sealing strip						m	100	X	X	X	X
			For seal strip repair: Cut/Manufacture sealing strip to size						m	100	X	X	X	X
			For seal strip repair: Install seal strips by means of seal welding						m	500	X	X	X	X
			For seal strip repair: re-welding of sealing strip (re-instating the weld)						m	50	X	X	X	X
			Do thickness test on the floor from the M-line to the precipitators and repair the floor where the meshes are starting to be visible (Repair to include re-instating or filling of lincreate)						Each	2	X	X	X	X
13.3		M-line to precipitators skirt plates	Remove the skirt plates at the precipitator entry for supple joint inspection. (LH & RH)			W		Contractor	Each	4	X	X	X	X
			Replace it with 10 mm thick steel plate. While care must be taken not to damage the fabric material when removing the skirt plates. (LH & RH)						Each	4	X	X	X	X
13.4		1) M-line to precipitators supple joint (LH & RH) 2) Mixing point to M-line	Inspect the supple joints and repair/patch if minor damaged. (Supple joints must not be patched if seriously damaged, Engineering to approve before repair is performed)			W		Contractor	Each	4	X	X	X	X

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COMPONENT ACTIVITIES											Outage Type				
ACTION															
No	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	Ref. BOM item (No from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICATION	Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units	IN	IR	MO	GO	
			Inspect the supple joints and replace if found damaged.						Each	4	X	X	X	X	
14		Precipitators to stack									X	X	X	X	
14.1	HNA19AA001 HNA29AA001	Precipitators to stack ducting LH & RH, Including turning vanes	Inspect the duct for any wear and distortion			W		Contractor	Each	2	X	X	X	X	
			Repair the damages									X	X	X	X
			For window patching repair: Cut the damaged damper section out						M^2	10	X	X	X	X	
			For window patching repair: Manufacture a new section window patch						M^2	10	X	X	X	X	
			For window patching repair: Install window patch by means of seal welding						m	100	X	X	X	X	
			For double plating repair Manufacture the double plating section						M^2	5	X	X	X	X	
			For double plating repair Install the double plate by means of seal welding						m	50	X	X	X	X	
			For seal strip repair: Remove sealing strip						m	50	X	X	X	X	
			For seal strip repair: Cut/Manufacture sealing strip to size						m	50	X	X	X	X	
			For seal strip repair: Install seal strips by means of seal welding						m	100	X	X	X	X	
			For seal strip repair: re-welding of sealing strip (re- instating the weld)						m	20	X	X	X	X	
			Visual inspection of the all turning vane at smokestack inlet and repair all distorted and wear areas.			W		Contractor	Each	1	X	X	X	X	
			Inspect the turning vanes at smokestack inlet for damages. Inspect wall thickness (see note 1 above). Report of wall thickness to be submitted to engineering.						Each	1	X	X	X	X	
			For window patching repair: Cut the turning vane section out.						M^2	20	X	X	X	X	
			For window patching repair: Manufacture a new window patch.			CONTROLLED DISCLOSURE			M^2	20	X	X	X	X	

COMPONENT ACTIVITIES											Outage Type			
						GOVERNING DOCUMENTS		ACTION						
№	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	Ref. BOM item (No from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICATION	Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units	IN	IR	MO	GO
14.2		Supple joints - Precipitator outlet ducting supple joints (LH and RH). - ID fan inlet supple joints (LH and RH). - ID fan outlet ducting supple joints (LH and RH).	For window patching repair: Install window patch by means of seal welding on turning vane.						m	50	X	X	X	X
			Remove the skirt plates at the supple joint inspection.						Each	10	X	X	X	X
			Replace it with 10 mm thick steel plate. While care must be taken not to damage the fabric material when removing the skirt plates						Each	10	X	X	X	X
			Inspect the supple joints and repair/patch if minor damaged. <i>(Supple joints must not be patched if seriously damaged, Engineering to approve before repair is performed)</i>						Each	10	X	X	X	X
			Inspect the supple joints and replace if found damaged.						Each	10	X	X	X	X
14.3		RH & LH ID fan to stack isolating damper	Inspect the dampers for wear and distortion			W		Contractor	Each	2	X	X	X	X
			If damper is unrepairable, manufacture a new damper <i>(* includes removing and replacing the damper)</i>			W		C&I, MMD, P&T and Engineer (if available) must be available.	Each	2	X	X	X	X
			Repair all the damaged dampers.						M^2	4	X	X	X	X
			For window patching repair: Cut the damaged damper section out											
			For window patching repair: Manufacture a new damper section window patch						M^2	4	X	X	X	X
			For window patching repair: Install window patch by means of seal welding. Ensure a minimum distance of 6 mm between any doubling plate/welding and damper plates.						m	40	X	X	X	X
			Inspect & tighten all the ball joints	CONTROLLED DISCLOSURE					Each	4	X	X	X	X

COMPONENT ACTIVITIES											Outage Type			
						GOVERNING DOCUMENTS		ACTION						
Nº	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	Ref. BOM item (No from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICATION	Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units	IN	IR	MO	GO
			Replace all the damaged ball joints						Each	4	X	X	X	X
			Replace all the damaged ball joints on all secondary air dampers. If any swivel joint has a free play of > 0,1 mm, it must be replaced if it cannot be tightened. Welding on the swivel joints is not permitted.											
			Do functional checks including links operation and ensure open and closing positions are correct (part of commissioning).						Each	2	X	X	X	X
			check actuator condition - look for signs of grease leakage and wear on actuator drive / revolving nut.											
			Also do stroke checking						Each	2	X	X	X	X
			Damper shafts glands packing: Replace all the damper shafts glands packing.						Each	2	X	X	X	X
			End shafts gaskets: Replace all the end shafts gaskets.						Each	4	X	X	X	X
15		Tubular Air heater To Mixing Point									X	X	X	X
15.1	HNA26 HNA16	Tubular air heater to mixing point	Inspect for high wear area in the ducting between the tubular air heater outlet and the mixing point inlet, measure the plate thickness at eroded areas and repair.			W		Contractor	Each	2	X	X	X	X
			Inspect the steel expansion bellows in the ducting between the tubular air heater outlets and the mixing point inlet			W		Contractor	Each	2	X	X	X	X
			Fit protection skirt plates on both expansion bellows.			W		Contractor	Each	2	X	X	X	X
			Inspect and repair all the turning vanes.			W		Contractor	Each	2	X	X	X	X
			Inspect steel expansion bellows for wear, holes and repair/replace.			W		Contractor	Each	2	X	X	X	X
			Inspect the mixing point ducts for wear			W		Contractor	Each	2	X	X	X	X
			Repair all distorted and worn areas.			W					X	X	X	X
			For window patching repair: Cut the damaged section out						M^2	5	X	X	X	X

CONTROLLED DISCLOSURE

COMPONENT ACTIVITIES											Outage Type			
						GOVERNING DOCUMENTS		ACTION						
Nº	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	Ref. BOM item (No from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICATION	Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units	IN	IR	MO	GO
15.2	HNA16/26AA011	Tubular air heater to M-Line LH & RH mixing point control damper	For window patching repair: Manufacture a new section window patch						M^2	5	X	X	X	X
			For window patching repair: Install window patch by means of seal welding						m	10	X	X	X	X
			For double plating repair Manufacture the double plating section						M^2	2	X	X	X	X
			For double plating repair Install the double plate by means of seal welding						m	5	X	X	X	X
			Inspect the dampers for wear and distortion			W		Contractor	Each	2	X	X	X	X
			If damper is unrepairable, manufacture a new damper (* includes removing and replacing the damper)						Each	2	X	X	X	X
			Repair all the damaged dampers. For window patching repair: Cut the damaged damper section out						M^2	4	X	X	X	X
			For window patching repair: Manufacture a new damper section window patch						M^2	4	X	X	X	X
			For window patching repair: Install window patch by means of seal welding. Ensure a minimum distance of 6 mm between any doubling plate/welding and damper plates.						m	40	X	X	X	X
			Inspect & tighten all the ball joints						Each	4	X	X	X	X
			Replace all the damaged ball joints Replace all the damaged ball joints on all secondary air dampers. If any swivel joint has a free play of > 0,1 mm, it must be replaced if it cannot be tightened. Welding on the swivel joints is not permitted.						Each	4	X	X	X	X
			Do functional checks including links operation and ensure open and						Each	2	X	X	X	X

CONTROLLED DISCLOSURE

											Outage Type				
COMPONENT ACTIVITIES						GOVERNING DOCUMENTS		ACTION							
Nº	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	Ref. BOM item (No from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICATION	Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units	IN	IR	MO	GO	
			closing positions are correct (part of commissioning).												
			check actuator condition - look for signs of grease leakage and wear on actuator drive / revolving nut.												
			Also do stroke checking							Each	2	X	X	X	X
			Damper shafts glands packing: Replace all the damper shafts glands packing.							Each	2	X	X	X	X
			End shafts gaskets: Replace all the end shafts gaskets.							Each	4	X	X	X	X
			Ensure shaft protection is installed using ceramic sleeves and 6mm shaft protection sleeves.						Each	4	X	X	X	X	

NOTES:

- *NDTs to be done on all the bridging pieces throughout the ducting for crack indication.*
- *All dampers to be marked with a grinder on the shaft indicating the closed and open*
- *And Final Inspections to be conducted by Eskom System Engineer, MMD and contractor for all completed work.*

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3.2 TUBULAR AIR HEATER

COMPONENT ACTIVITIES				Ref. BOM item (No from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICAT ION	GOVERNING DOCUMENTS		ACTION		
No	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)			Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units
1.	HNA	Tubular Air Heater								
1.1	HNA	TAH	Identify external leakage areas before the unit is taken off load. Listen for leaks and mark the identified areas			W		MMD, Contractor & System Engineer (if available)	Each	1
1.2	HNA	Inspection doors	Open all the top, intermediate and bottom, left-hand and right-hand inspection doors. Doors to be closed after completion of repairs.			W		Contractor	Each	12
1.3	HNA	TAH	Vacuum clean ash at tubular top, intermediate and bottom, left-hand and right-hand. And Erect scaffolding at the cold end					Contractor	Each	1
1.4	HNA	TAH	Pressure test tubular air heater after ash cleaning of TAH to identify tube leaks, tube plate leaks and leaks on casings and bellows. (Arrange with the unit controller to ensure the availability of the fans). Mark all leaking tubes and areas. The test must be done before the 6.6 KV boards are off. One PA Fan is needed for the test. Skirt plates in the air heater must be removed first for inspection and access scaffolding at the bottom of the air heater must be built before the pressure test is done.		PWN/HLD/003	H		MMD, Contractor & System Engineer (if available)	Each	1
1.5	HNA	TAH	Water-wash through high [pressure washing], all tubes on tubular air heater from top to bottom (flue gas side). Washing to be done one tube at a time. 17 712 tubes at Top banks, and 16 848 tubes at Bottom banks. Make provision to drain water during washing. Note the TAH must drip-dry at least 5 days.			W		Contractor	Each	34 560
1.6	HNA	TAH	Conduct a tube cleanliness assessment, by inspecting the tubes at the hot end, intermediate, and cold end. Inspect all tubes each at a time, using an Endoscope to identify blocked tubes. If there is blockage: note that this must FIRST be washed again BEFORE washing can be completed.			H		Contractor	Each	34 560

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No	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)			Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units
1.7	HNA	TAH	Inspect tube condition and tube plates for wear and damage. (Inspect left and right, top, intermediate and bottom. Inspect for erosion wear and holes on tubes. Perform Endoscope Inspection on all tubes to identify leaking tubes with holes.			W		Contractor	Each	34 560
1.8	HNA	TAH	Plug the leaking tubes at the top and bottom (if identified by pressure test and endoscope inspection) Count all the plugged tubes on the top bank and bottom bank. No plugging to be done before consulting with the system engineer. NB: PLEASE CHECK AND COUNT THE TOTAL NUMBER OF PLUGGED TUBES AT TOP, MIDDLE AND TOP. ALSO, EACH TO BE PLUGGED ON BOTH OPENING ENDS i.e. CLOSED OFF ON BOTH SIDES. Do not plug more than 10%.		Report of the location and amount of the plugged tubes to the submitted.	H		Contractor and MMD	Each	3 456
1.9		TAH	Remove damaged sleeve inserts which were already installed using a sleeve puller . Install new sleeve inserts. NB: All sleeves damaged to be removed without damaging the parent tube.			H		Contractor and MMD	Each	34 560
1.10		TAH	A tube expander to be used to expand sleeve inserts to the parent tube and to achieve a tight installation of inserts/ or tight tube-tube plate joint.			W			Each	34 560
1.11	HNA	TAH	Perform wall thickness measurement on tubes to measure wear rate and record results.			R			Each	34 560
1.12	HNA	TAH	Clean ash deposited above the (rear and front) top tube plates after washing was done (The deposited ash is acidic & corrosive). Fill up tube plate using refractory/ LINCREATE to prevent erosion of tube plates and tubes.			W			Each	4
1.13	HNA	TAH	Perform tube mapping assessment and compile full air heater drawing report indicating defects such as plugged, fouled, and erosion wear. NB: Tube mapping report to be done on a Matimba drawing arrangement for tube plates, and must indicate the type of defect i.e. Fouling, Plugging and Percentage of erosion. The tube mapping report must also show tube quantity for		Report of the condition to tubes to be submitted.	H		Contractor and MMD	Each	1

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COMPONENT ACTIVITIES				Ref. BOM item (No from the BOM)	PROCEDURE /CHECK SHEET/SPECIFICAT ION	GOVERNING DOCUMENTS		ACTION		
No	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)			Intervention Points (H/W/R)	SAP Group Number	RESPONSIBLE DEPARTMENT	Unit of Measure	Estimated Units
			each defect and location of tubes on Matimba drawing arrangement							
1.14	HNA	TAH	Remove skirt plates to inspect and repair top end expansion bellows (and replace skirt plates if it totally damaged). Top bellow is a known leakage area. Seal all cracks/erosion damage. Do visual inspection on other expansion bellows			W		Contractor	Each	2
1.15	HNA	TAH	Replace the expansion joint on recommendation of the system engineer, while a method statement will be needed before any work is done.						Each	2
1.16	HNA	TAH	Inspect all the TAH casing (ducting or Walls) from top to-intermediate-to bottom for erosion and wear. Measure wall thicknesses. Repair as required through welding window patch						M^2	5000
1.17	HNA	TAH	Tighten all bolts on the rear and front inlet manifold gasket flanges.			W		Contractor	Each	2
1.18			The Pressure test must be done again, after the work was completed, during the PA fan balancing or boiler commissioning.						Each	1
1.19	HNA	TAH	Final inspection.			W		Contractor and System Engineer	2	24

NOTES:

- Tubular air heater repairs to be done in IR, Mo & GO and during opportunity maintenance as and when required.

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4. BILL OF MATERIALS

No	COMPONENT FLOC KKS CODE	COMPONENT DESCRIPTION	COMPONENT / MATERIAL SPECIFICATION	CRITICALITY CRITICAL/NON CRITICAL	Drawing No.	Group Number	Position Number	STOCK NUMBER	Required Quantity	Unit of measure
		DUCTINGS								
1.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001 & HLA01	6mm plates	MS	Critical				17147	45216	Kg
2.	HLA01	8 mm plates	MS	Critical				17142	18800	Kg
3.	HLA01	10 mm plates	MS	Critical				162359	2355	Kg
4.	HNA25AA011	12mm plates	MS	Critical				17143	1413	Kg
5.	HNA17/27 & HNA25AA011	Flat bars 100x6 mm	MS	Non critical				17084	6500	Kg
6.	HNA17/27 & HNA25AA011	Channel iron 100x50	MS	Non critical				17177	4529	Kg
7.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	50x6 Flat bar	MS	Non critical				17082	552.24	Kg
8.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	25x6 Flat bar	MS	Non critical				17079	70.8	Kg
9.	HNA13/23	Angle iron 40x40	MS	Non critical				17181	712,8	Kg
10.	HNA13/23	Angle iron 50x50	MS	Non critical				17175	2145.6	Kg
11.	HNA17/27 & HNA25AA011	76x38 Chanel iron	MS	Non critical				17188	201	Kg
12.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	60x60x6 Angle iron	MS	Non critical				17197	195.12	Kg
13.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	80x6 Flat bar	MS	Non critical				17110	188,4	Kg
14.	HNA17/27	80x80 Angle iron	MS	Non critical				17198	1409.28	Kg
15.	HNA17/27	Round bar 30mm	MS	Non critical				161973	167	Kg
16.	HNA17/27	Round bar 12mm	MS	Non critical				17101	79.95	Kg
17.	HNA17/27	Round bar 16 mm	MS	Non critical				17102	94.8	Kg
18.	HNA17/27	Channel iron	MS	Non critical				17201	1188	Kg
19.	HNA00	65NB pipe	MS	Non critical				54994	6	m
20.	HNA00	20NB pipe	MS	Non critical				55498	6	m
21.	HNA00	80NB pipe	MS	Non critical				55503	120	m
22.	HNA00	M12X30 Bolts and nuts	MS	Non critical				83591	100	Kg
23.	HNA00	M10X45 bolts and nuts	MS	Non critical				84562	25	Kg
24.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	10 mm Packing gland Klinger K466M	K3222	Non critical				101028	25	Kg
25.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	8 mm Packing gland Klinger K466M	K3222	Non critical				98332	25	Kg

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26.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	Gaskets Klinger Milam PSS 1.5x2x3mm	Mica KlingerMilamPSS	Non critical				197971	3	sheets
27.		Plate Metal SABs 1431 (16 mm)	MS	Non critical				17148	3770	Kg
28.	HNA00	None asbestos rope		Non critical				98449	15	Kg
30.	HNA	BAR FLAT:WD 40 MM;LG 6 M;THK 6 MM;43A						0017081	45,12	kg
31	HLA	PLATE MTL:MS;EN43A;BS 4360-1972 TABLE 6						0017143	1 413	kg
32	HNA	BAR FLAT:WD 25 MM;LG 6 M;THK 5 MM;EN43A						0017153	58.8	kg
33	HNA	CHANNEL STRCTRL:WD 76 MM;LG 6 M;HT 152						0017176	107.4	kg
34	HNA	ANGLE STRCTRL:100 MM;10 MM;LG 6 M;CS;15						0017183	3 600	kg
35	HNA	COVER:BEARING;WD 106 X LG 151 X HT 59 MM						0031601	20	kg
36	HNA	JOINT BALL:18 MM;LH THD;STL						0051141	20	kg
37	HNA	PIPE MTLC:65 MM;STL;LG 6 M;4.5 MM;WELDED						0054994	6	kg
38	HNA	PIPE MTLC:50 MM;STL;LG 6 M;4.55 MM						0055502	6	kg
39	HNA	BOLT ASSY:GP;M16;LG 65 MM;HEX;4.6;MS;40						0083584	75	kg
40	HNA	BOLT ASSY:GP;M10;LG 25 MM;HEX;4.6;MS;25						0083594	25	kg

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No	COMPONENT FLOC KKS CODE	COMPONENT DESCRIPTION	COMPONENT / MATERIAL SPECIFICATION	CRITICALITY CRITICAL/NON CRITICAL	Drawing No.	Group Number	Position Number	STOCK NUMBER	Required Quantity	Unit of measure
41	HNA	BOLT ASSY:NIB;M16;LG 50 MM;CSK KEYED;4.6						0084414	100	kg
42	HNA	BOLT ASSY:GP;M16;LG 45 MM;HEX;MS;25 MM;1						0084536	350	kg
43	HNA	BOLT ASSY:GP;M8;LG 25 MM;HEX;4.6;MS;25;1						0084553	25	kg
44	HNA	BOLT ASSY:GP;M20;LG 75 MM;HEX;4.6;MS;48						0084600	50	kg
45	HNA	WASHER LK:ID 12.4 MM;OD 17.9 MM;THK 2.35						0087514	100	kg
46	HNA	PIN CTTR:3.2 MM;LG 40 MM;STL						0092127	100	
	HNA	PACKING BULK:WD 12 MM;THK 12 MM;YARN;SQ						0098334	2	
	HNA	PACKING BULK:WD 12.7 MM;THK 12.7 MM;LG 5						0098449	15	
	HNA	PACKING BULK:WD 8 MM;THK 8 MM;SQ						0101027	12	
	HNA	PACKING BULK:WD 12 MM;THK 12 MM;SQ;477-1						0101029	5	
	HNA	PLATE MTL:MS BS 4360, SABS 1431;589 KG						0162358	2 356	kg
	HNA	ADHESIVE:SILICON;TUBE 310 ML						0190043	48	
	HNA	SHEET GSKT:THK 3 MM;LG 1.5 M;WD 1.5 M						0197975	3	
	HNA	JOINT BALL:AH32-1 19X35- 02;10 MM;LH THD	CONTROLLED DISCLOSURE					0679920	100	

No	COMPONENT FLOC KKS CODE	COMPONENT DESCRIPTION	COMPONENT / MATERIAL SPECIFICATION	CRITICALITY CRITICAL/NON CRITICAL	Drawing No.	Group Number	Position Number	STOCK NUMBER	Required Quantity	Unit of measure
	HNA	JOINT BALL:10 MM;THD;STL;DAMPER LINKS						0679921	100	
		SHAFTS								
30.	HNA13/23 & HNA25AA011	120 mm BRIGHT STEEL EN8	EN8	Non critical				0679930	12	m
31.	HNA16/26AA011	80 mm BRIGHT STEEL EN8	EN8	Non critical				0679929	6	m
32.	HNA13/23 & HNA25AA011	60 mm BRIGHT STEEL EN8	EN8	Non critical				0679931	6	m
33.	HNA16/26AA011	50 mm BRIGHT STEEL EN8	EN8	Non critical				0679922	6	m
34.	HNA13/23 & HNA25AA011	40 mm BRIGHT STEEL EN8	EN8	Non critical				0679053	6	m
35.	HLA11/12/13/14/15/21/22/23/24/25AA001	30 mm BRIGHT STEEL EN8	EN8	Non critical				0678024	6	m
36.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	22 mm BRIGHT STEEL EN8	EN8	Critical				700850	6	m
37.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	25 mm BRIGHT STEEL EN8	EN8	Non critical				0678023	6	m
		HOLLOW BAR (FOR BUSHINGS)								
38.	HNA13/23 & HNA25AA011	125x71mm,hollow bar	MS	Non critical				700839	6	m
39.	HNA13/23 & HNA25AA011	170x118 mm, hollow bar	MS	Non critical				0678022	6	m
40.	HLA11/12/13/14/15/21/22/23/24/25AA001	90x50 mm, hollow bar	MS	Non critical				0677830	6	m
41.	HNA16/26AA011	85x55 mm , hollow bar	MS	Non critical				0677834	6	m
42.	HNA16/26AA011	80x45mm, hollow bar	MS	Non critical				0677835	6	m
43.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	60x40mm, hollow bar	MS	Non critical				0677833	6	m
		KEY STEEL EN8								

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No	COMPONENT FLOC KKS CODE	COMPONENT DESCRIPTION	COMPONENT / MATERIAL SPECIFICATION	CRITICALITY CRITICAL/NON CRITICAL	Drawing No.	Group Number	Position Number	STOCK NUMBER	Required Quantity	Unit of measure
44.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	14 mm X 9 mm	EN8	Non critical				0679928	1m	m
45.	HLA11/12/13/14/15/21/22/23/24/25AA001	22 mm x 14 mm	EN8	Non critical				0676954	1m	m
46.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	11mm x 11mm	EN8	Non critical				0677829	1m	m
47.	HNA16/26AA011	30mmx18mm	EN8	Non critical				0676956	1m	m
		PLATES								
48.	HNA16/26	16 MO3 alloy steel plate x 6mm thick	15MO3/ 16MO3	Noncritical				700835		
		VRN 400 steel plates 6 mm thick	VRN 400	Critical				TBC	50 Plates	
		BALL JOINTS								
49.	HHL00	Alfred Hyde ball joints for damper links. LH threads M14X1.5mm Pitch/M10x1mm Pitch		Non critical				51139	50	each
50.	HHL00	Alfred Hyde ball joints for damper links. RH threads M14X1.5mm Pitch/M10x1mm Pitch		Non critical				50767	30	each
51.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	Alfred Hyde ball joints for damper links. LH threads M22X1.5mm Pitch/M14x1.5mm Pitch		Non critical				249402	32	each
52.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	Alfred Hyde ball joints for damper links. RH threads M22X1.5mm Pitch/M22x14mm Pitch		Non critical				249401	32	each
53.	HNA16/26AA011	Alfred Hyde ball joints for damper links. LH threads M24X1.5mm Pitch/M10x1mm Pitch		Non critical				51140	20	each
54.	HNA16/26AA011	Alfred Hyde ball joints for damper links. RH threads M24X1.5mm Pitch/M16x1.5mm Pitch		Non critical				50764	20	each

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No	COMPONENT FLOC KKS CODE	COMPONENT DESCRIPTION	COMPONENT / MATERIAL SPECIFICATION	CRITICALITY CRITICAL/NON CRITICAL	Drawing No.	Group Number	Position Number	STOCK NUMBER	Required Quantity	Unit of measure
55.	HNA15/5AA011	Alfred Hyde ball joints for damper links.		Non critical				50766	20	each
		LH threads M30X1.5mm Pitch/M20x1.5mm Pitch								
56.	HHL11/12/13/14/15/21/22/23/24/25/31/32/33/34/35/41/42/43/44/45AA001	Alfred Hyde ball joints for damper links.		Non critical				51138	20	each
		RH threads M30X1.5mm Pitch/M20x1.5mm Pitch								
57.	HNA16/26AA011	Alfred Hyde ball joints for damper links.		Non critical				50767	20	each
		RH threads M22X1.5mm Pitch/M12x1.5mm Pitch								
		SUPPLE JOINTS (see the drawings attached for the specifications of the joints)								
58.	HNA17/27	M-Line to Precip supple joints.	Glass fibre/PTFE Polytetrafluoroethylene	Critical	Appendix A			0674809	4	each
59.	HNA18/19/28/29	ID Fan outlet supple joints	Glass fibre/PTFE Polytetrafluoroethylene	Critical	Appendix A			0674974	4	each
60.	HLB00	FD Fan outlet supple joints	Glass fibre/PTFE Polytetrafluoroethylene	Critical	Appendix A			0674812	2	each
61.	HLB01	PA Fan supple joints.	Glass fibre/PTFE Polytetrafluoroethylene	Critical	Appendix A			MR	2	each
62.	HNA	Smoke stacks supple joints	Glass fibre/PTFE Polytetrafluoroethylene	Critical	Appendix A			0674968	2	each
68.	HNA	Rotary to M-Line	Glass fibre/PTFE Polytetrafluoroethylene	Critical	Appendix A			0674810	4	each
		SLEEVES								
63.	HLD01	Ceramic sleeve rings		Non critical				0676949	8	each
		OD=114mm,ID=88mm,t=38mm								
		CEMENT								
64.	HLD01 & HNA17/27	Wear protection services 25kg Lincrite 2 wear resistance concrete		Critical				0676735	2500	Kg
		INSERTS TUBES								

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No	COMPONENT FLOC KKS CODE	COMPONENT DESCRIPTION	COMPONENT / MATERIAL SPECIFICATION	CRITICALITY CRITICAL/NON CRITICAL	Drawing No.	Group Number	Position Number	STOCK NUMBER	Required Quantity	Unit of measure
65.	HLD01	Extension tubes, Side flared 50mm, OD=40mm,ID=36mm, Length=200mm	EN8	Critical				0676961	4428	each
		WEAR PROTECTION								
66.	HNC15/25	Wear sleeves – 140mm Mild steel pipe, 6mm thick (152,4 mm and 6,3mm thick)	MS	Non-critical				700850 (20957)	1	m
		EXPANSION JOINTS								
67	HNC - TAH to Mixing point	2 Piece; 1 x single expansion ID 3316; 1 x double expansion ID 3316, 1,5 mm thick		KCR 37/23; BS1449				680348	2	sets
68	Bullet Hinges 150 x M20	Bullet Hinges 150 x M20						704400	300	Each
69	HHL	JOINT EXPSN:BELLOW;ID 1260 X OD 1692 MM (Style 2 – double convolution)	Carbon steel	Critical				747071	4	Each
70	HHL	JOINT EXPSN: STYLE 1;ID2130 X HT216 MM (For A Mill Duct)	Carbon steel	Critical				774125	8	Each

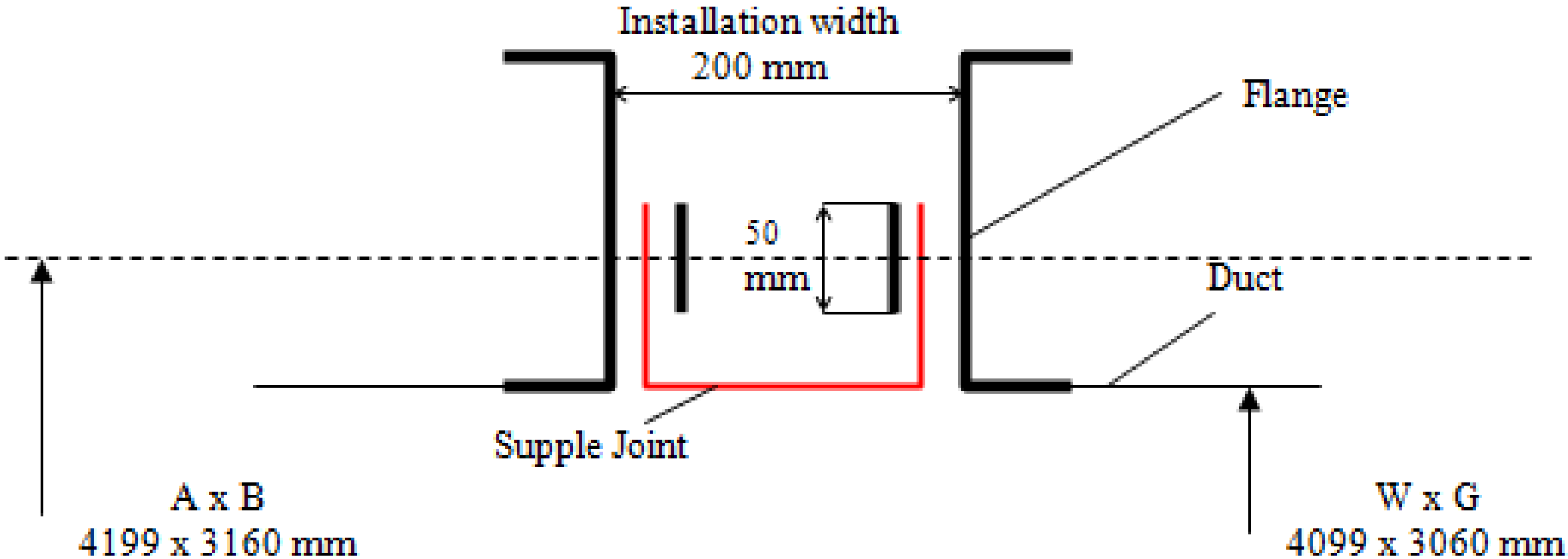
NB: ANY ITEM WITHOUT SAP NUMBER IS NOT A STOCK ITEM.

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4.1 APPENDIX A: SUPPLE JOINTS DIMENSIONS/LAYOUT

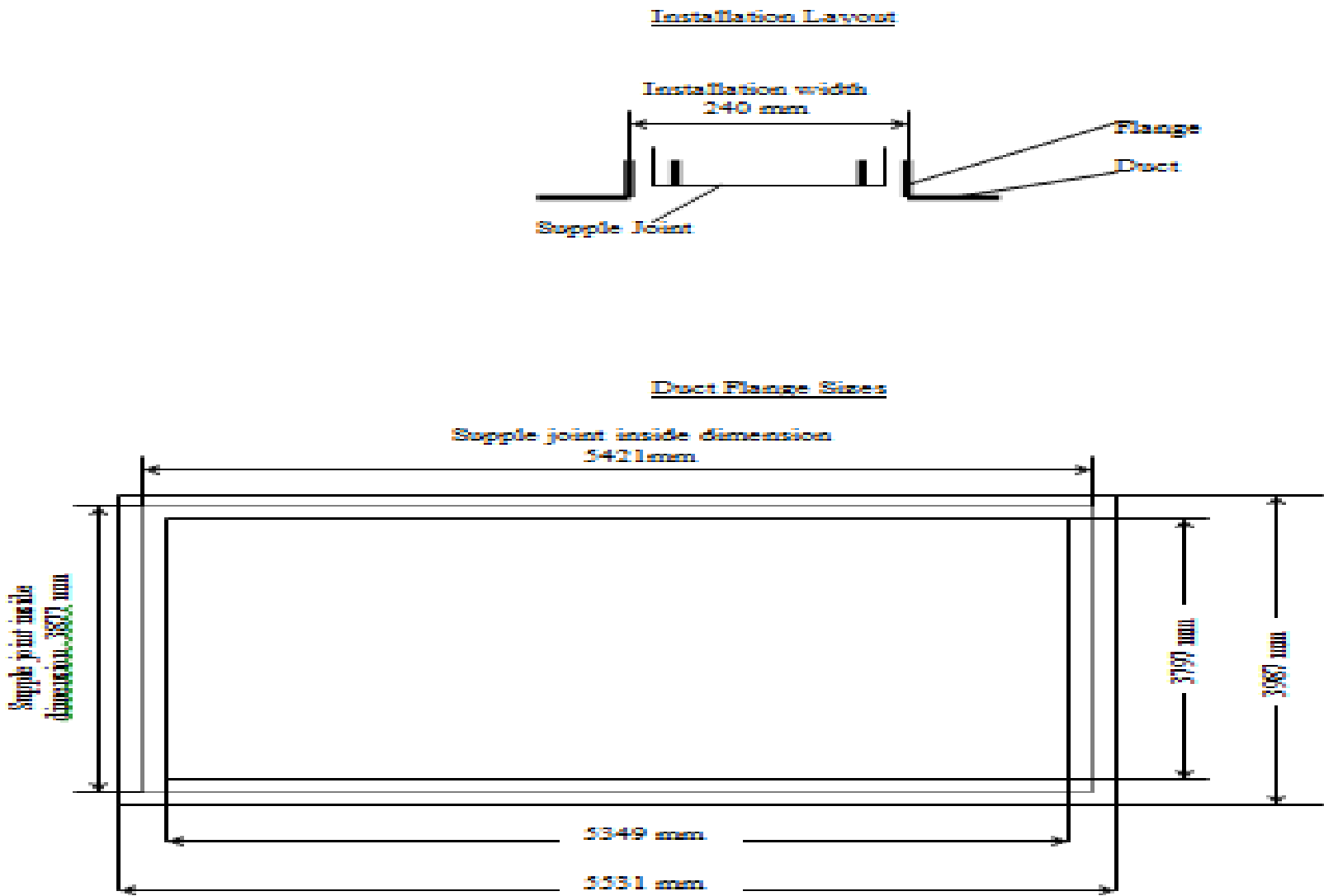
FD Fan outlet supple joint



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ID Fan outlet supple joint

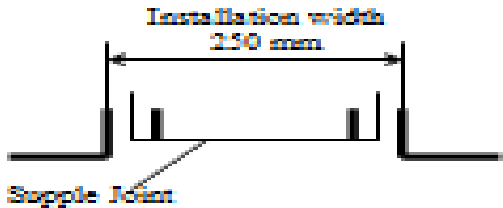


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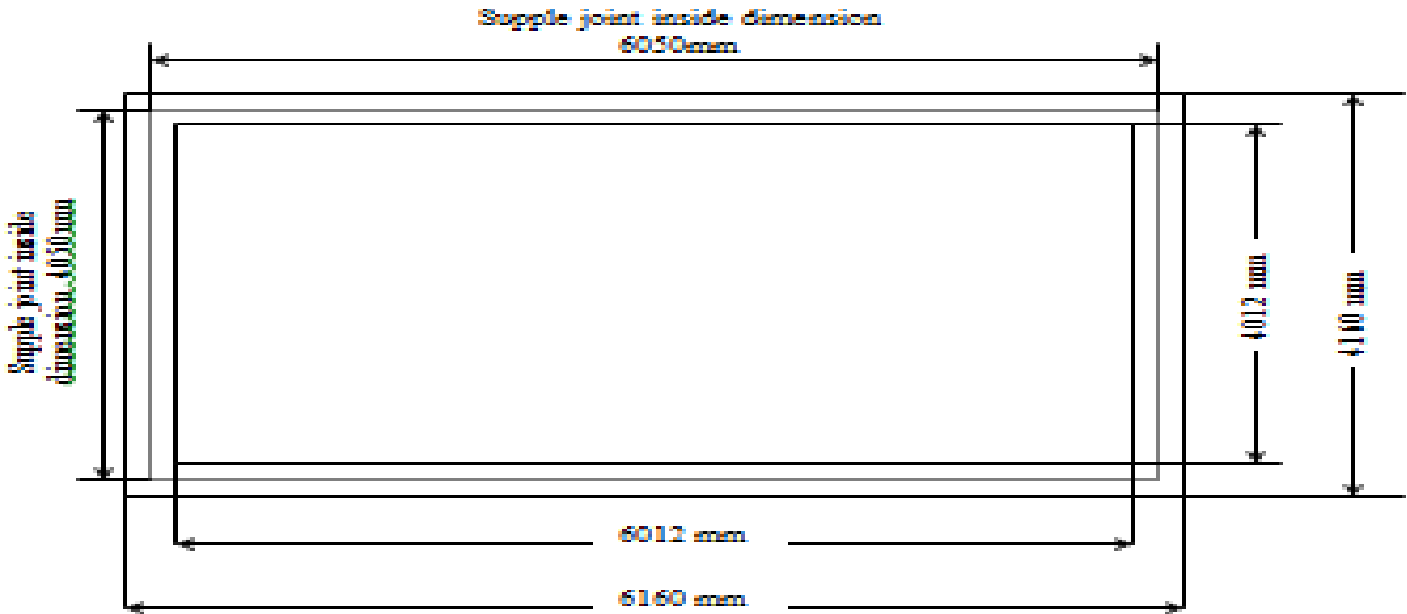
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Precipitator inlet/outlet supple joint

Installation Layout



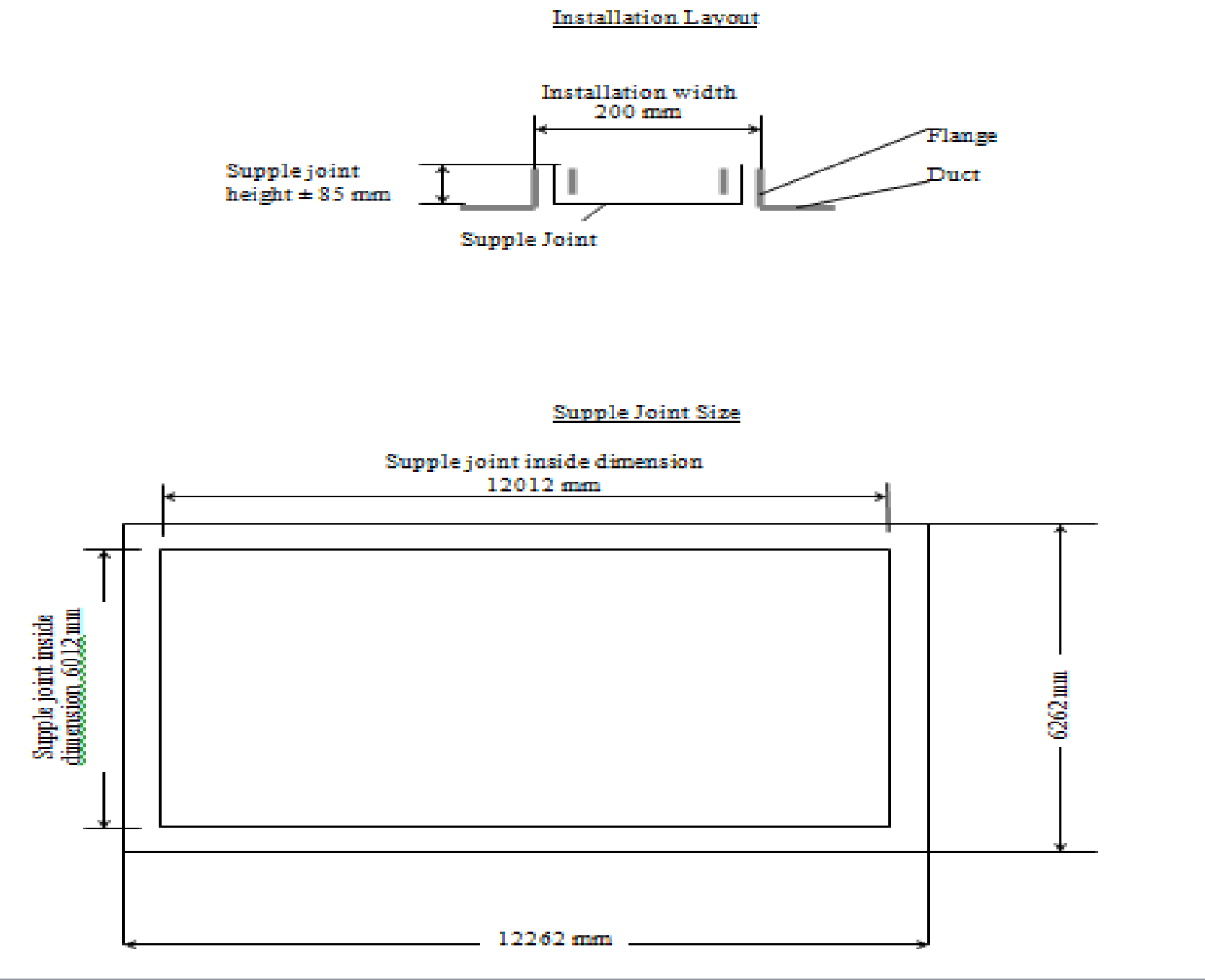
Duct Flange Sizes



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Smoke stack inlet supple joint

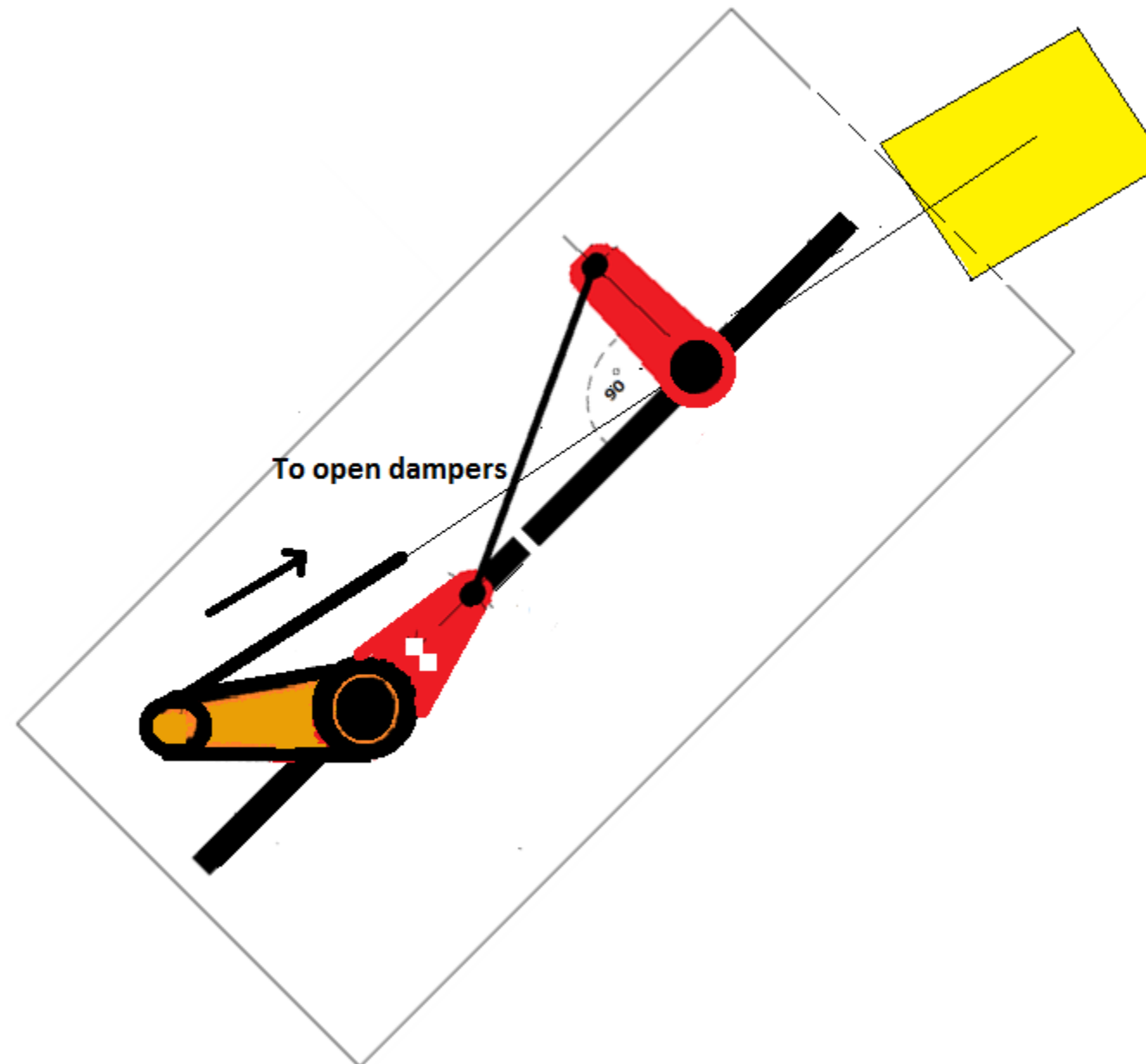


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MIXING POINT DAMPER

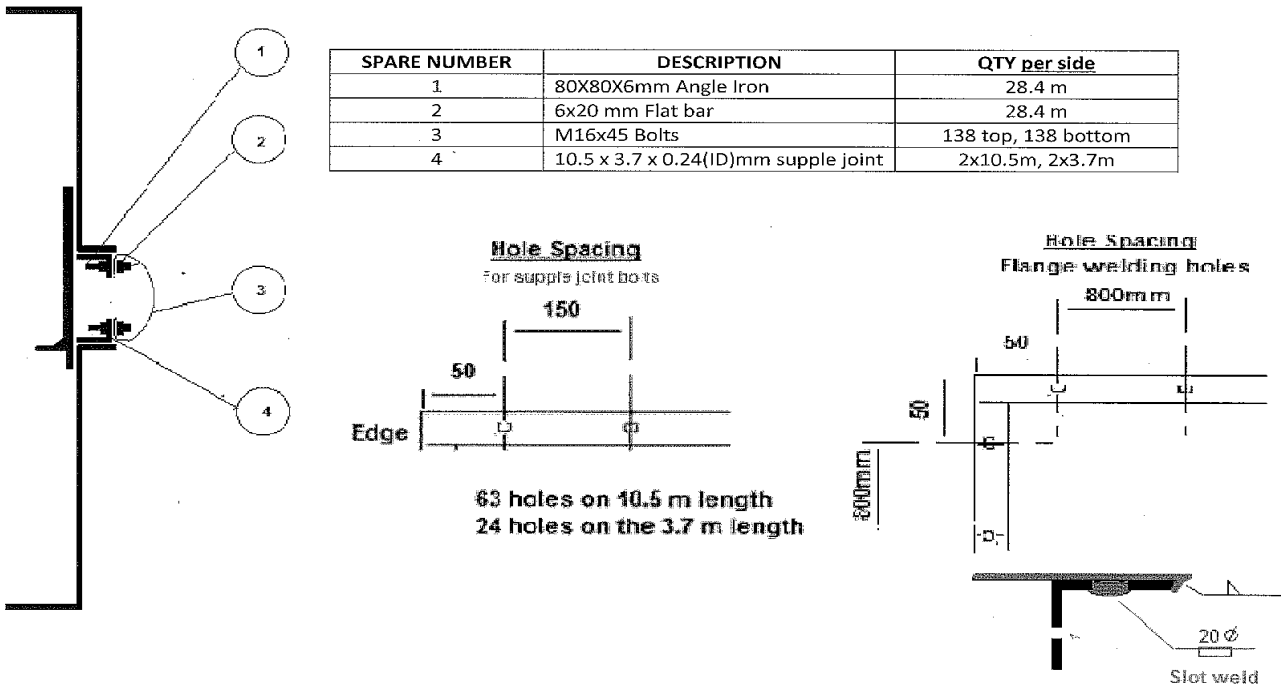
1. The direction of the dampers opening are in the direction of flow
2. Actuator cables are not swapped around , because the actuator drive the links from the top and not the the bottom
3. Unit 4 is not configured the same as the other units
4. This drawing is applicable to all mixing point dampers except for unit 4



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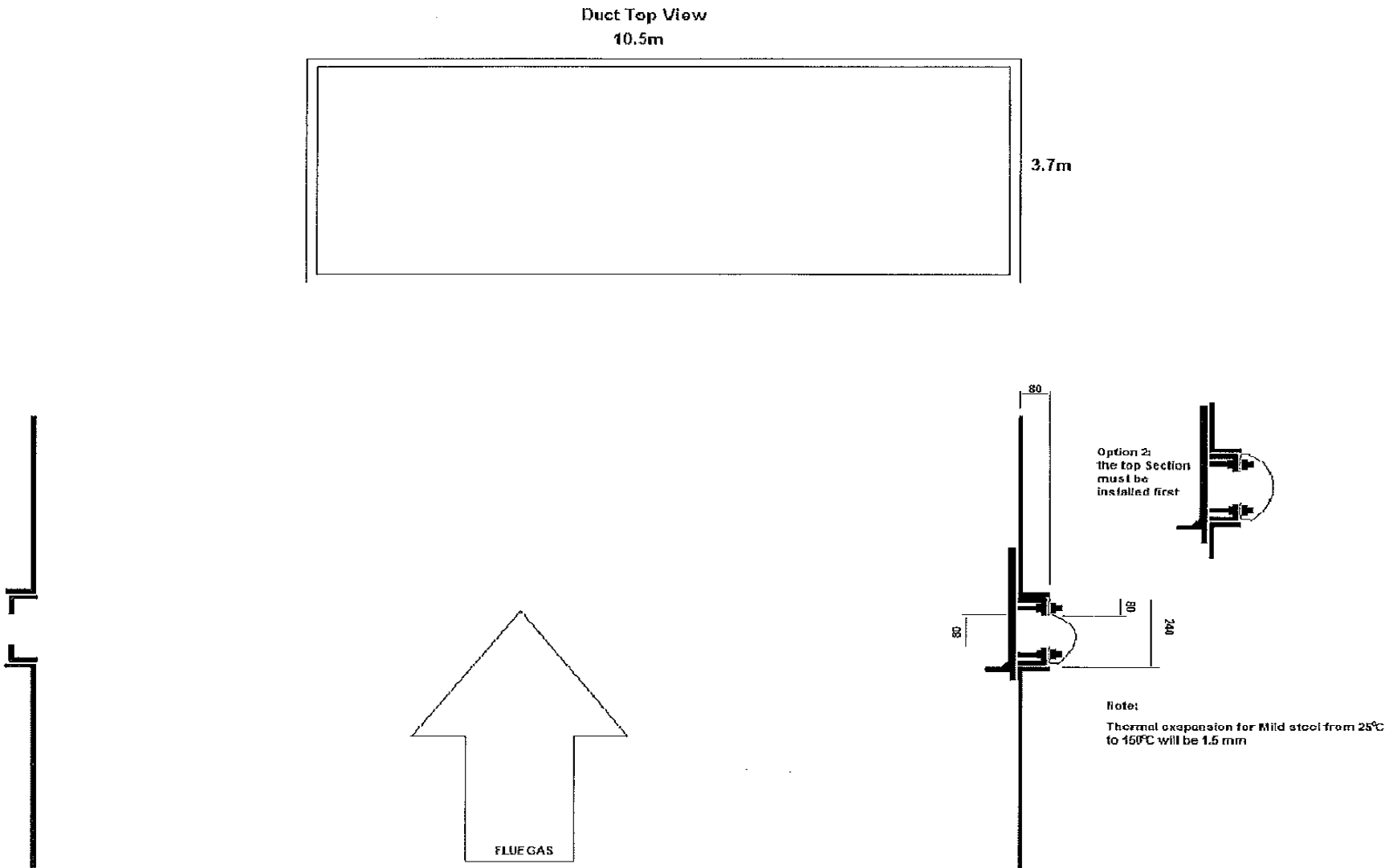
Rotary to M-Line Supple joint
Installation Method



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Rotary to M-Line Supple joint



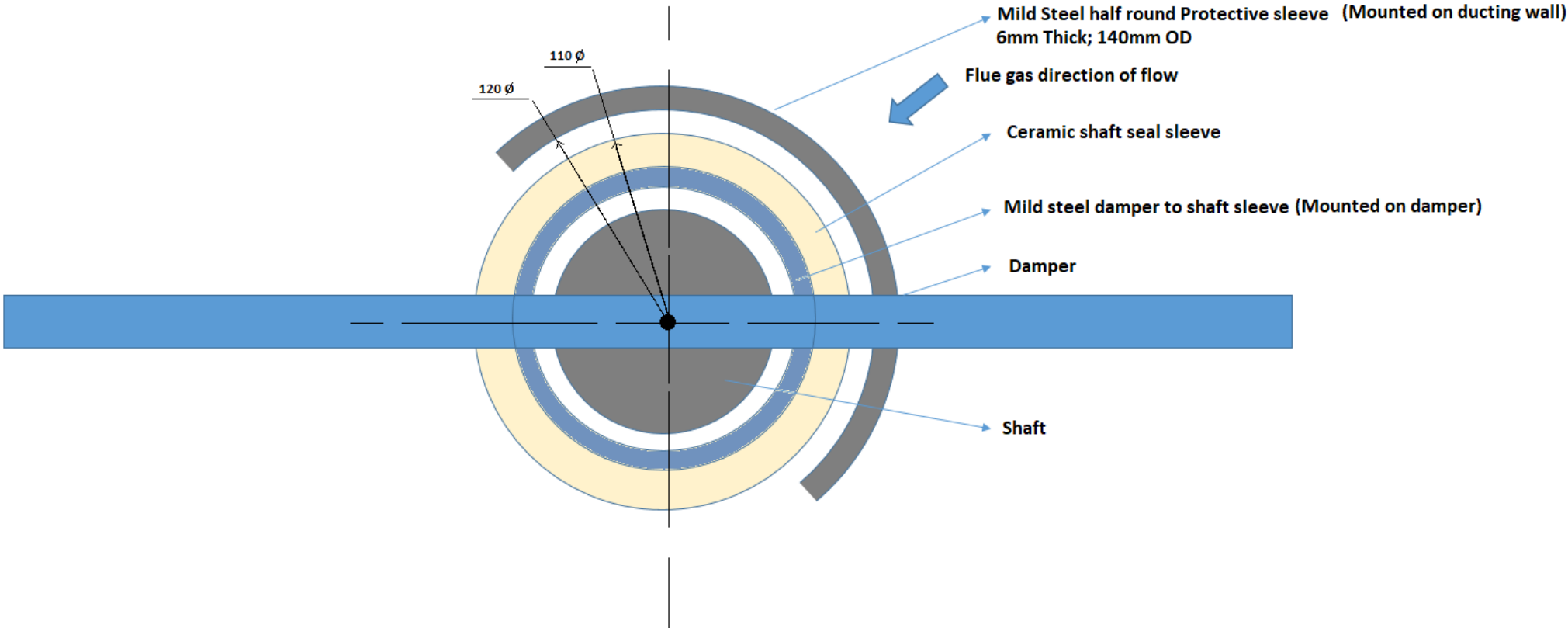
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4.2 APPENDIX B: SHAFT WEAR PROTECTION

Ceramic sleeve – ID 88mm x OD 114mm x THK 38mm

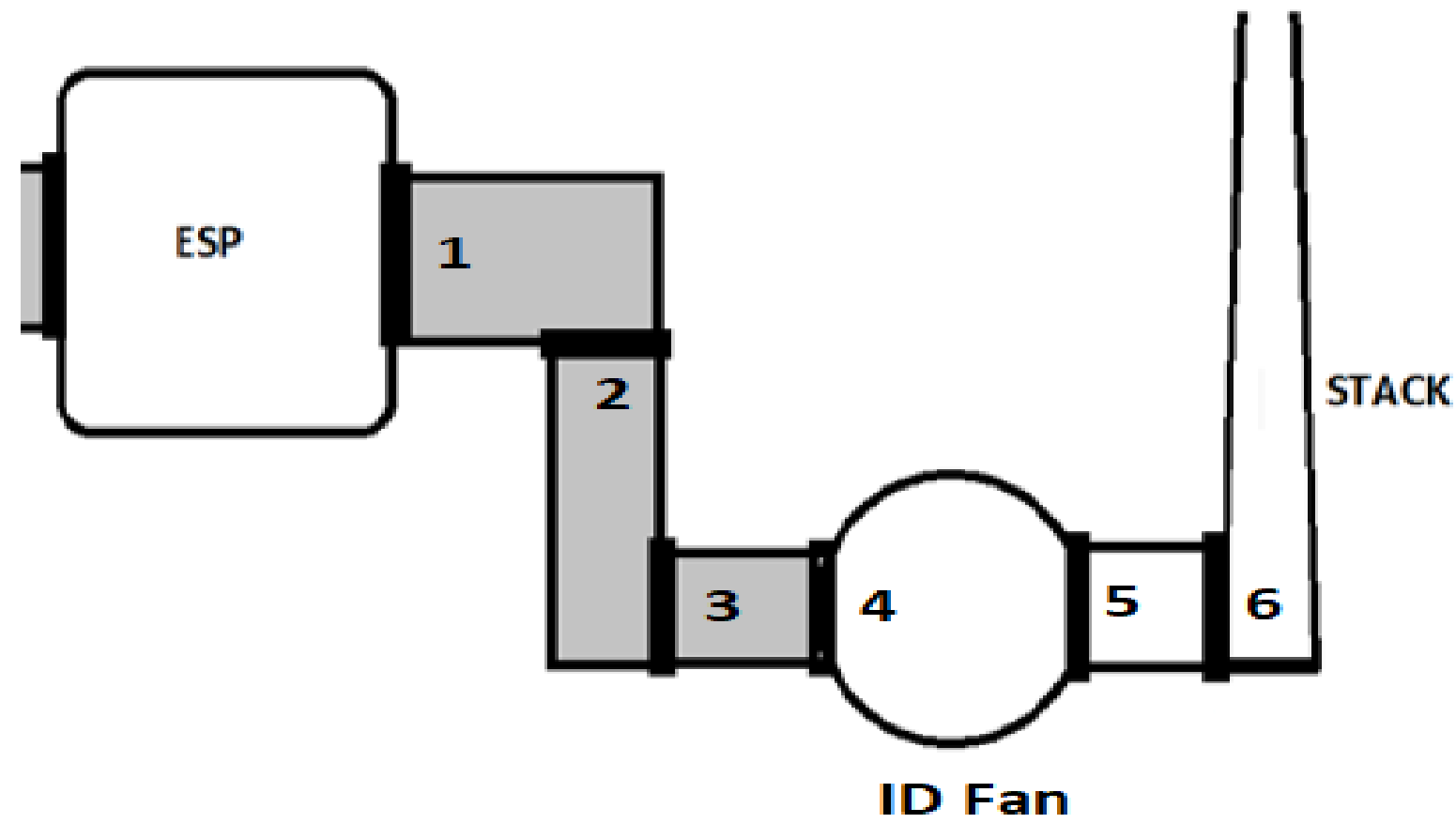
Mixing point damper wear sleeve configuration:



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4.3 APPENDIX C: EXPANSION JOINT INSPECTION POINTS FOR THE PRECIPITATOR TO STACK SECTION



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5. AUTHORISATION

This document has been seen and accepted by:

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Riaan Nel	Boiler Engineering Manager
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David Mabela	Snr Supervisor Tech Maint

6. REVISIONS

Date	Rev.	Compiler	Remarks
January 2026	0	Xolani Bila	First Draft

7. DEVELOPMENT TEAM

The following people were involved in the development of this document:

- Insert text here

8. ACKNOWLEDGEMENTS

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