

PLANT ITEM DESCRIPTION	3
SUPPLIER	MARINI - BE TOWER 2500
COLD FEED SYSTEM	
COLD FEEDERS -	6
VOLUME OF COLD FEEDERS	11m3
LOADING WIDTH	3.5m
LOADING HEIGHT	3.4m
LOADING DEPTH	2.2m
BIN EXTENSIONS	YES
BELT WIDTH	600mm
FEEDER BELT MOTOR SIZE	1.5KW
BIN VIBRATORS INCLUDED	1
BIN VIBRATORS MOTOR SIZE	0.45KW
COLLECTING CONVEYOR	600mm @ 310t/h
COLLECTING CONVEYOR MOTOR SIZE	7.5KW
CONVEYOR BELT TO DRYER DIMENSIONS	500mm X 15.6m @ 220t/h
CONVEYOR BELT TO DRYER MOTOR SIZE	5.5KW
BYPASS BELT FOR DRYER	500mm X 2.25m @ 210 t/h
BYPASS BELT FOR DRYER MOTOR SIZE	3KW
COVERED CONVEYOR	YES
DRYER	
DRYER DIMENSIONS	E206 D-2.06m x 8.5m
DRYER STEEL THICKNESS	8MM S355J0
CHUTE THICKNESSES	10mm HARDOX 450
VSD DRUM	YES
TRUNNION DRIVE	Yes
TRUNNION DRIVE MOTOR SIZE	4 x 15KW
INSULATED DRUM	YES - 40MM
INSULATION DENSITY	80kg/m3
BURNER - GAS & HEAVY OIL	YES
BURNER SIZE	13.4MW
BURNER PRESSURE - Gas flow on burner inlet	0.2 / 1.5 BAR
BURNER CONTROL	ETAMATIC S
SILENCER FITTER	YES minus 5-7 dB
BURNER AIR BLOWER MOTOR SIZE	30KW
GAS TRAIN	NO
GAS CAPABLE	Yes
WASTE OIL CAPABLE	Yes
DIESEL CAPABLE	Yes
WASTE OIL SYSTEM	HIGH PRESSURE PUMP
WASTE OIL HEATING	ELECTRIC
PCI of Heavy Fuel oil	39,960 kJ/kg
MAX HEAVY FUEL CONSUMPTION	1.210 Kg/Hr
FUEL OIL PUMP MOTOR SIZE	4KW
FUEL OIL FEED PUMP OUTPUT	4.400 m3/Hr
FUEL OIL FEED PUMP MOTOR SIZE	1.5KW
ELECTRICAL PUMP AND PIPE HEATING	1.6KW
PIPE INSULATION THICKNESS	80mm
PIPE INSULATION DENSITY	70 Kg/m3
BAGHOUSE FILTRATION	

EXTRACTOR FAN CAPACITY	41,805 Nm3/Hr
EXTRACTOR FAN MOTOR SIZE	90KW
STACK DIAMETER	950MM
VSD INSTALLED	YES
INSULATED	50mm MINERAL WOOL
FILTRATION SURFACE AREA	663 m2
NUMBER OF BAGS	450
FABRIC TYPE	ARAMID 400 g/m2
FILTER SHAPE	OVAL
LONGITUDINAL SCREW LARGER FINES MOTOR SIZE	5.5KW
DOUBLE ELEVATOR FINES/RECOVERED FILLER	20m3/h
ELEVATOR DRIVE MOTOR	5.5KW
RECOVERED FINES SILO SIZE	23m3
BAGHOUSE ABOVE DRYER Y/N	YES
PRESEPERATOR	YES
LONGITUDINAL SCREW MOTOR SIZE	5.5KW
MIXING TOWER	
MIXING TOWER	YES
HOT ELEVATOR	220 TPH
HOT ELEVATOR MOTOR	22KW
HOT ELEVATOR CHAIN	DOUBLE CHAIN - RING
HOT ELEVATOR HEIGHT	25m
HOT AGG SCREENS	5
SCREEN SURFACE AREA	26.9M2
SCREEN MOTOR SIZE	2 X 7.5KW
HOT AGG STORAGE	5 bins
HOT AGG CAPACITY	22T
SCREEN REFUSE BIN	YES - 1.5m3
FINES FILLER BIN VIBRATOR MOTOR SIZE	0.18KW
HOT PRODUCT STORAGE	2 X 50T + 2 X 55T
DIRECT DISCHARGE	12T
INSULATION	50mm THERMAL AND CLADDING
HEATING OF EACH CLAM DOOR	3KW
HEIGHT OF UNDER STORAGE PASSAGE	4m
LOAD OUT PROGRAMMING	YES
HOT BIN LEVEL INDICATORS	YES
SCREEN CRANE	YES - 500kg
MIXER SIZE	2.5T
MIXER DRIVE MOTORS	2 X 30KW
WARM MIX CAPABLE	YES
EPOXY CAPABLE	YES
EMULSION CAPABLE	YES
BLUE SMOKE CONTROL	Ducted to burner/baghouse
BLUE SMOKE FILTER	OPTIONAL
BITUMEN WEIGH BIN HEATING	2 X 800W
BITUMEN SPRAY PUMP MOTOR SIZE	7.5KW
BITUMEN SPRAY PUMP HEATING	1.6KW
ELECTRICAL MIXING BIN HEATING	4 X 1.5KW

FILLERS AND ADDITIVES	
IMPORTED FILLER SILO	42m3
IMPORTED FILLER ELEVATOR MOTOR SIZE	4KW
FILLER SCALE DISCHARGE SCREW	5.5KW
RECOVERED FINES SCREW MOTOR SIZE TO HOPPER	4KW
LIQUID ADDITIVE SYSTEM	YES
FIBRES DOSING SYSTEM	YES
FIBRES DOSING SYSTEM MOTOR SIZE	1.5KW
HOPPER STORAGE	3m3
RAP SYSTEM	
RAP FEED HOPPERS	3
RAP FEED HOPPER CAPACITY	11m3
RAP FEED LOADING WIDTH	3.5M
RAP EXTRACTOR BELT	6-90 TPH
RAP EXTRACTOR BELT MOTOR SIZE	2.2KW
RAP BUCKET ELEVATOR	150t/h
RAP BUCKET ELEVATOR MOTOR SIZE	9.2KW
COLD RAP WEIGH BELT	YES
COLD RAP INTO MIXER	YES
COLD RAP INTO DRUM COLLAR	YES
MAX RAP CONTENT	60%
RAP WEIGH BELT	400mm @ 306 t/h
RAP WEIGH BELT MOTOR SIZE	2.2KW
RAP CONVEYOR BELT	500mm X 20m @ 210tph
RAP BUCKET ELEVATOR	
RAP CHUTE CAPACITY	
BITUMEN TANKS AND PUMPS	
BITUMEN TANKS	3
VERTICAL/HORIZONTAL	VERTICAL
VOLUME OF TANKS	60m3
BITUMEN TANK STIRRERS	3
TANK DIAMETER	2.9m
EXTERNAL DIAMETER	3.4M
HEATING	(12 X 1KW) + (1 X 25KW)
BITUMEN FEED PUMP	49m3/h @ 11KW
BITUMEN PUMP HEATING	ELECTRIC
BITUMEN PIPING TO PLANT	YES
BITUMEN WEIGH BIN	233KG
BITUMEN WEIGH BIN HEATING	(2 X 800W) + (1X 400W)
BITUMEN FILLING PUMP	
GENERAL ITEMS	
BUILD LOCATION	ITALY
CONTROL CABIN	YES
CONTROL CABIN DIMENSIONS	5.9m X 2.3m X 2.5m
CONTROL SYSTEM	CYBERTRONIC 500
ELECTRICAL CONTAINER	YES
EXHAUST STACK MONITORING	NO
HEIGHT TO TOP OF STACK	27.605m
HEIGHT TO TOP OF TOWER	25m
NZ SEISMIC / WIND COMPLIANT	YES

SKIP SYSTEM ENCLOSURE			AVAILABLE
AIR COMPRESSOR PRESSURE			10 BAR
AIR COMPRESSOR SIZE			15KW
AIR DRYER MOTOR SIZE			1.04KW
ELECTRIC HOIST			500kg
SHIPPING			
SHIPPING			40 x 40ft containers + bit tank break bulk
SHIPPING ORIGIN			Alfonsine - Italy
TECHNICIANS - MECHANICAL			1 X 90 DAYS
TECHNICIANS - ELECTRICAL			1 X 75 DAYS
PLANT TRAINING			1 X 5 DAYS
PLANT PERFORMANCE			
RAP CONTENT	MOISTURE CONTENT	CYCLE TIME (S)	
No Rap	MAX TPH WITH 2T BATCH SIZES	45	200
10%	3% MOISTURE	52	200
	4% MOISTURE	54	200
	5% MOISTURE	55	180
	6% MOISTURE	56	
20%	3% MOISTURE	60	200
	4% MOISTURE	62	195
	5% MOISTURE	65	173
	6% MOISTURE	68	
30%	3% MOISTURE	67	200
	4% MOISTURE	71	188
	5% MOISTURE	75	166
40%	3% MOISTURE	74	200
	MIXING CAPACITY		2.5T
	HOT ASPHALT STORAGE		OVERNIGHT
	WARRANTY		24 MONTHS
	NZ BASED PLANT SUPPORT		NO - Marini AU

Environmental Pollutant and sound emissions

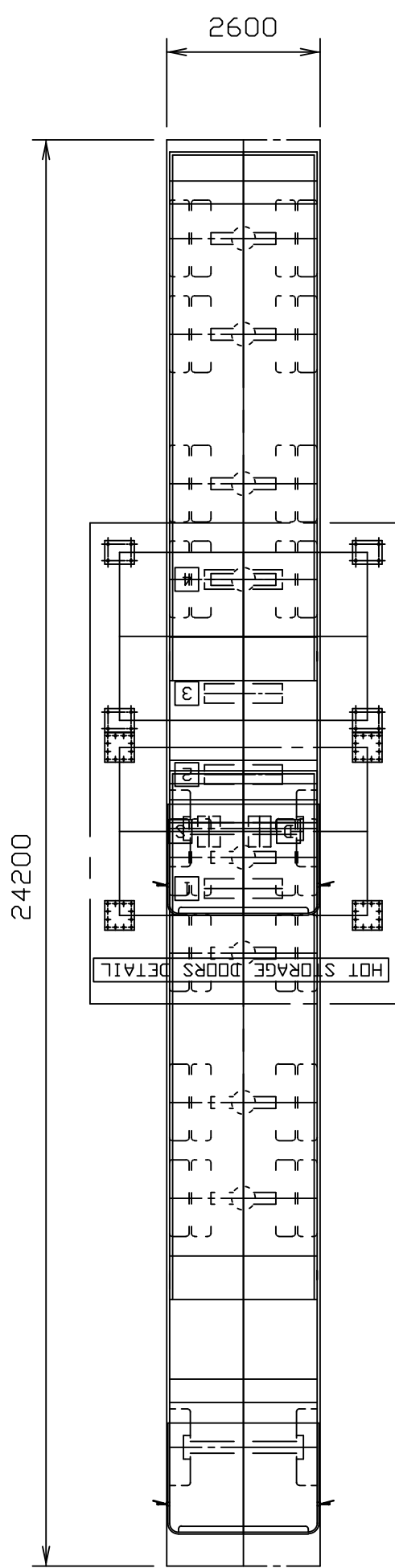
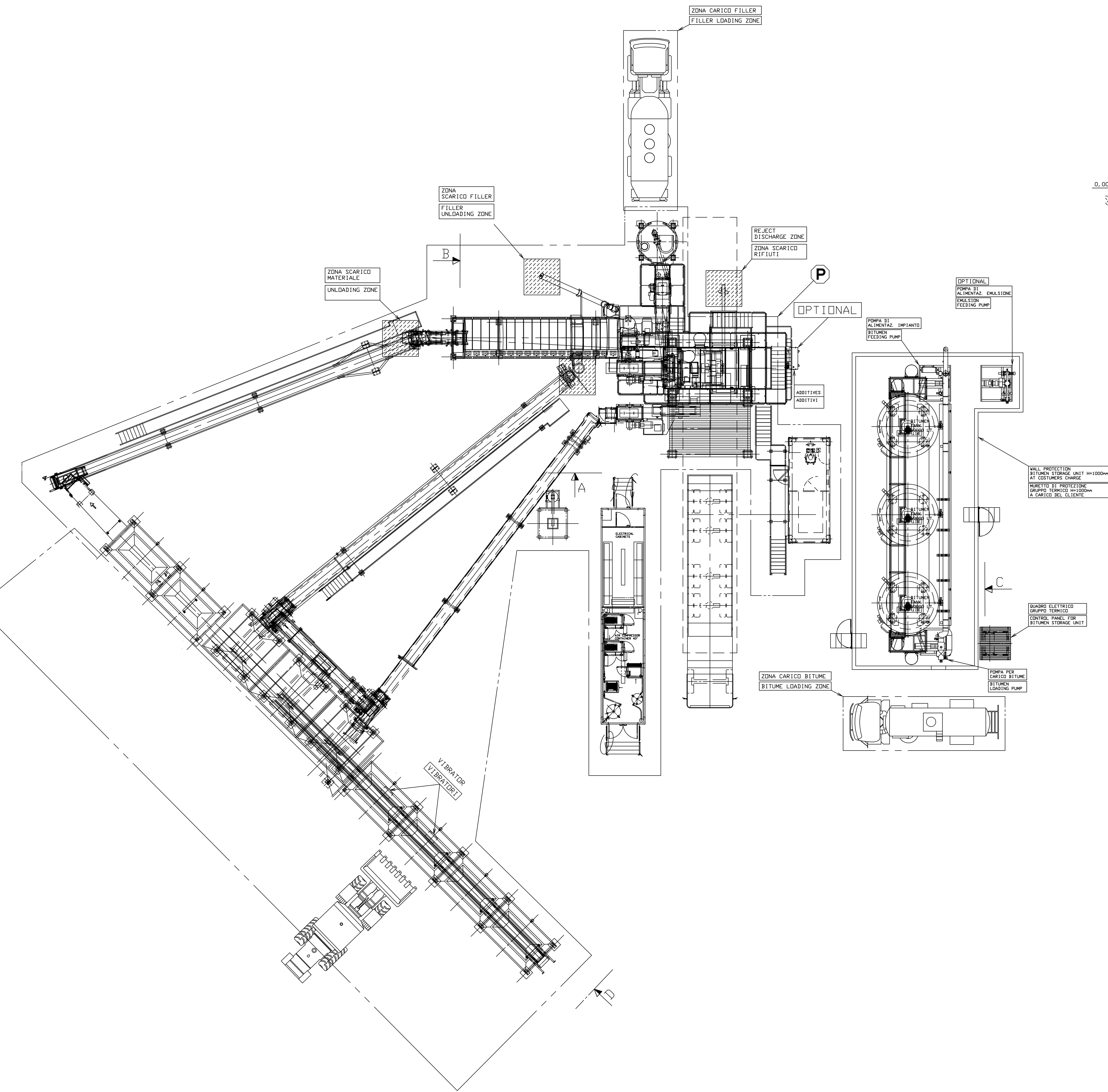
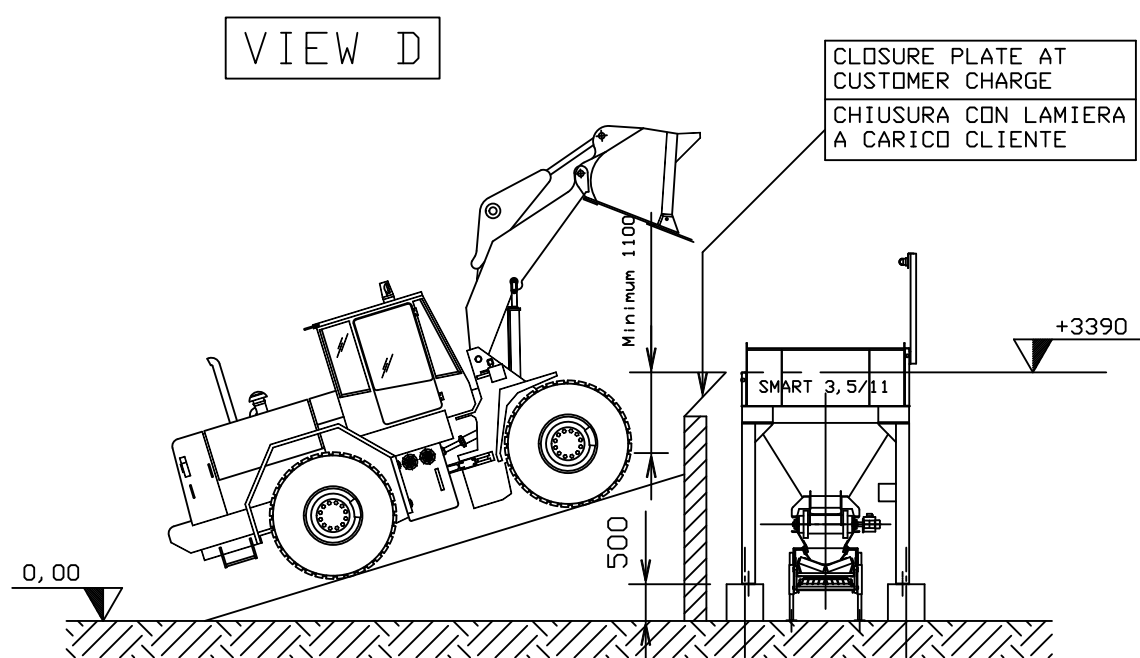
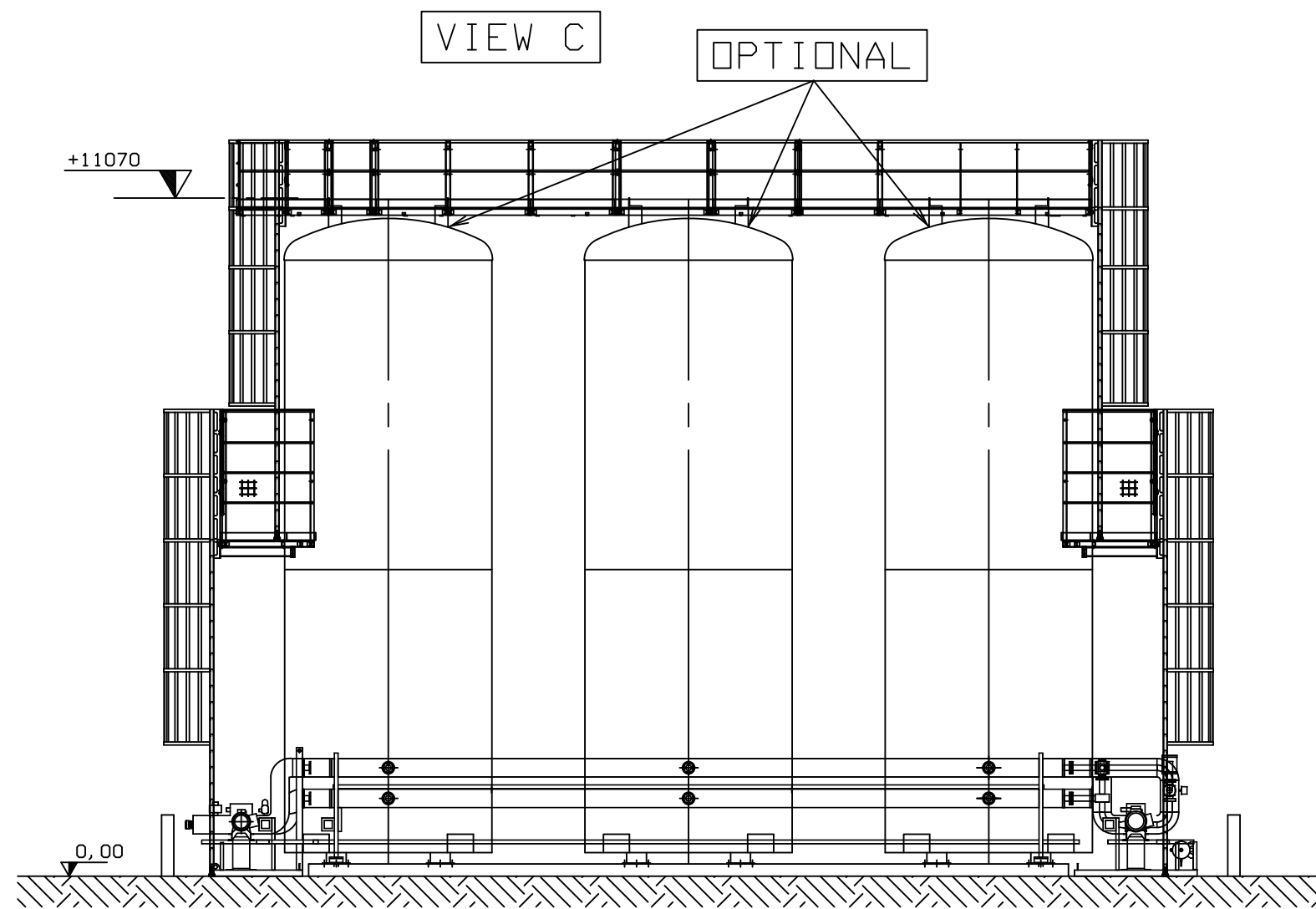
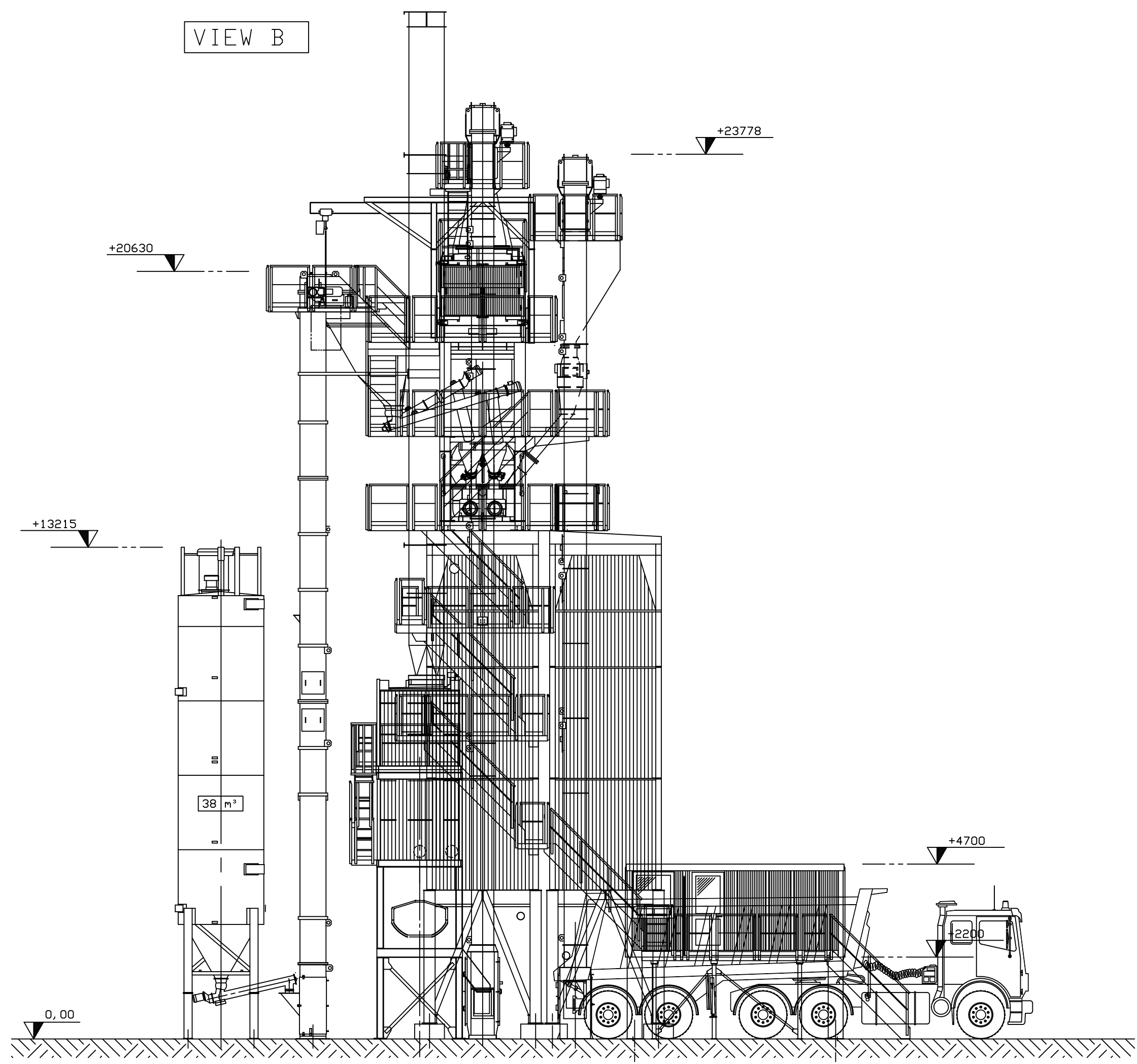
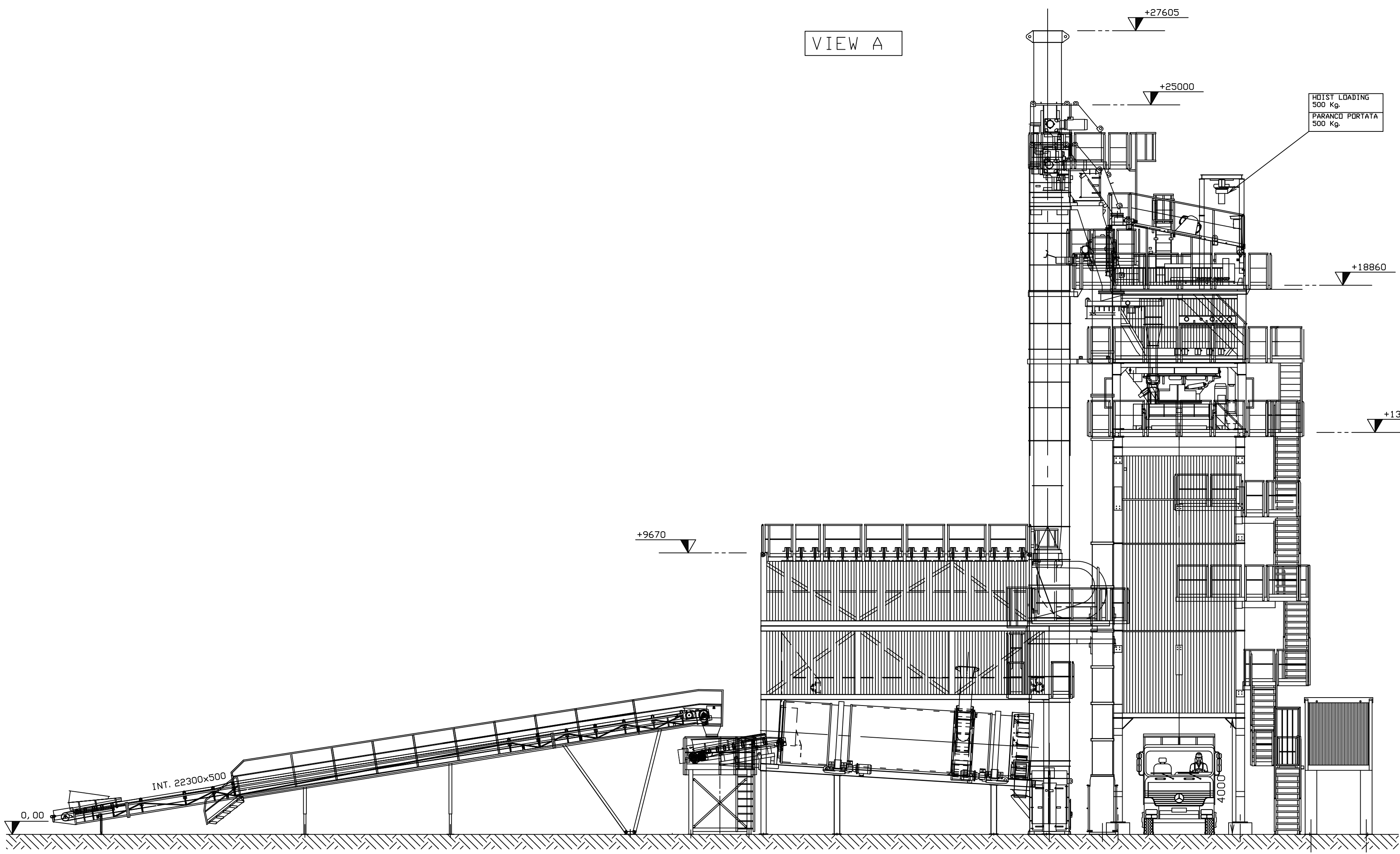
CHIMNEY

Dust		<20mg/Nm3
Nox		<250 mg/nM3
SOx		<1,700 mg/Nm3
CO		<500 mg/Nm3
O2		17% in combustion products

BOILER CHIMNEY

Nox		<250 mg/nM3
Sox		<1,700 mg/Nm3
CO		<500 mg/Nm3
O2		3% in combustion products

[illegible]



DISEGNO PRELIMINARE PRELIMINARY DRAWING

FALLING MATERIAL DANGER
DELIMITATION AREA AT CUSTOMER CHARGE
PERICOLO CADUTA MATERIALE
DELIMITAZIONE AREA A CARICO DEL CLIENTE

CONCRETE BED ZERO ON LEVEL TO BE CARRIED OUT BEFORE
THE ASPHALT PLANT ASSEMBLY AT CUSTOMER CHARGE.
PLATEA A PIANO 0.00 DA REALIZZARE PRIMA DEL
MONTAGGIO DELL'IMPIANTO A CURA DEL CLIENTE.

N. B.: LE QUOTE DEL PRESENTE DISEGNO SONO DA CONSIDERARSI
PURAMENTE INDICATIVE

N. B.: THE DIMENSIONS CONTAINED IN THIS DRAWING ARE TO BE
CONSIDERED INDICATIVE

Normative di Riferimento		Siti di Calcolo - Calculation data	
Reference Standard		VENIOT - WIND	
NTC 2018 - S.M. 17/02/18 (15/10/21)	NTC 2018 - S.M. 14/03/08 (15/10/21)	NTC 2018 - S.M. 26/02/09 (15/10/21)	NTC 2018 - S.M. 14/03/08 (15/10/21)
UNI EN 1990:2005 (Eurocode 0)	UNI EN 1991-1-1:2004 (Eurocode 1)	UNI EN 1991-1-1:2004 (Eurocode 1)	UNI EN 1991-1-1:2004 (Eurocode 1)
UNI EN 1992-1-1:2005 (Eurocode 2)	UNI EN 1993-1-1:2005 (Eurocode 3)	UNI EN 1993-1-1:2005 (Eurocode 3)	UNI EN 1993-1-1:2005 (Eurocode 3)
UNI EN 1994-1-1:2005 (Eurocode 4)	UNI EN 1995-1-1:2005 (Eurocode 5)	UNI EN 1995-1-1:2005 (Eurocode 5)	UNI EN 1995-1-1:2005 (Eurocode 5)
UNI EN 1996-1-1:2005 (Eurocode 6)	UNI EN 1997-1-1:2005 (Eurocode 7)	UNI EN 1997-1-1:2005 (Eurocode 7)	UNI EN 1997-1-1:2005 (Eurocode 7)
UNI EN 1998-1-1:2005 (Eurocode 8)	UNI EN 1999-1-1:2005 (Eurocode 9)	UNI EN 1999-1-1:2005 (Eurocode 9)	UNI EN 1999-1-1:2005 (Eurocode 9)

Pos.	Designation	Q. ty	Material	Wt Kg	Material Code	Part Code
	TOP TOWER 2500 27 23 SUM (2x50)+(2x55)					
	PLANIMETRIA GENERALE GENERAL LAY-OUT FULTON HEGAN - NEW ZELAND					
Material designation	Material	Material code	Material check	Material	Material	Material
Approved by	Date	21/10/21	Project method per ISO 1018	Treatment according to	Project method per ISO 1018	Treatment according to
Checked by	Date		Dimensions are in millimeters	Scale	1:100	Drawing number
Designed by	Date					MD4004/05

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Memorandum

Office: Tauranga
Email: Dale.Eastham@fultonhogan.com

To	Craig Batchelar – Cogito Consulting Ltd
From	Dale Eastham – National Manager – Environment and Sustainability
CC	Brian Palmer – Allied Asphalt
Date	11 January 2022
Subject	Technical memo – Asphalt Plant Selection Process

Introduction

Fulton Hogan are purchasing several asphalt plants to replace some old existing ones in Hamilton and Bay of Plenty, and installing a new one in Drury, Auckland. There was a very detailed analysis undertaken and this memo seeks to explain the differences between each supplier for the purposes of clarifying with councils the reasoning behind how the final plant supplier was chosen.

Suppliers

Initially four suppliers were approached to get the specifications of their asphalt plants being Marini, Ammann, Benninghoven and Astec. This was quickly reduced to two suppliers being Marini and Ammann. There were three plants from Marini that were part of the comparison analysis and one plant from Ammann.

Marini value themselves as the world leader in the production of asphalt plants. Ammann prides themselves in having a century worth of industry experience while ensuring that the development of plants worldwide provide real-time solutions.

The BE Tower 2000, BE Tower 2000P and BE Tower 2500 from Marini and the Value Batch from Ammann were compared across all aspects of their operations including each component of the plant.

Comparative Analysis

The tables showing each specific component of each plant and how they compare is attached in Appendix A. These are technically specific to allow us to choose the best plant for our needs. What the tables don't show is the reasoning behind why we chose the Marini Top Tower 2500, and particularly looking into the following areas:

Efficiency

- The larger mixer size of the Marini Top Tower 2500 compared to the Ammann Value batch allows for a higher production rate per hour. This allows for smaller storage silos and reduced waiting times for trucks thus improving efficiency and reducing the number of trucks required.
- The Marini TT2500 is designed to make more efficient use of available space by positioning the Baghouse over the mixing drum. This also reduces the amount of concrete required for the plant foundations.
- The plant was selected to include a variable speed drive on the drying drum for maximum heat exchange efficiency in the aggregate drying process. This feature was offered for both Ammann and Marini.

Cost effective

- The plant selection also included waste reduction consideration which is allowed for in a batch plant when compared to a continuous mixing drum plant. The New Zealand market requires a diverse range of asphalt products but also smaller production runs making a batch plant the more cost-effective solution.
- Both Ammann and Marini offer cost effective options however Marini's ability to use higher Rap contents as well as less fuel for drying and heating makes it more cost effective.

Environmental & Sustainability

- World class environmental performance was paramount in the selection process and the Marini Top Tower 2500 offered a larger baghouse surface area to better handle higher aggregate moisture contents and Rap contents, while still achieving a high standard of dust filtration.
- The installation of the filter above the dryer drum in the Marini allows, in comparison with a traditional asphalt plant like the Ammann, a significant reduction in both the overall electric consumption (thanks to the reduced number of screw conveyors) and the thermal energy losses.
- Marini Top Tower 2500 allows for higher Recycle Asphalt percentages than the Ammann design providing a more sustainable solution through aggregate and bitumen recovery.

Delivery

The Marini Top Tower 2500 is a fully containerized plant designed for standard international shipping compared to the Ammann plant which includes larger components shipped above deck. The design therefore allows for easier handling and transport when delivered to Auckland.

The Marini Top Tower 2500 is also built entirely in Italy compared to Ammann which is built in China with components also built in Germany and Italy which are then shipped to China.

Price

The price was determined by the plant specification to meet NZ standards and production requirements for each manufacturer. Ultimately the Marini Top Tower 2500 was the best priced plant for the application however this was not the only deciding factor in the selection process. Primary contributors to the price of the plant included international shipping, physical plant itself and seismic strengthening costs to meet New Zealand standards.

SUPPLIER	Plant A MARINI - BE TOWER 2000	Plant B AMMANN - VALUE BATCH	Plant C MARINI - BE TOWER 2000P	Plant D MARINI - BE TOWER 2500	Plant E	Plant F
COLD FEEDERS -	6 X 11m3	6 x 10m3	6 X 11m3	6 X 11m3	6	8 x 9m3
DRYER	1.8m D X 8.5m L	2m D x 8m L	2.06m D X 8.5m L	2.06m D X 8.5m L	9.23m L	2.0m D x 8.5m L
VSD DRUM	YES	YES	YES	YES	YES	V-Flights
TRUNNION MOTOR SIZE	4 X 11KW	4 X 11KW	4 x 15KW	4 x 15KW		
INSULATED DRUM	YES	YES	YES	YES	OPTION	Yes
BURNER - GAS & HEAVY OIL	YES	YES	YES	YES	YES	YES
BURNER SIZE	9MW	14MW	13.4MW	13.4MW	NEED INFO	10.25MW (35MBTU)
BURNER PRESSURE	0.2 / 1.5 BAR	0.15 / 0.2 BAR	0.2 / 1.5 BAR	0.2 / 1.5 BAR	NEED INFO	NEED Info
GAS TRAIN	NO	NO	NO	NO	NO	NO
MAX GAS CONSUMPTION @100% BURNER	900 Nm3/Hr	1400 Nm3/Hr	1340 Nm3/Hr	1340 Nm3/Hr		
FLOW VOLUME		16100 Nm3/Hr				
BAG FILTER	YES	YES	YES	YES	YES	YES
Baghouse Filter Area	525m2	482m2	663m2	663 m2		
RECOVERED FINES SILO	20m ³	40m ³	23m3	23m3	40m ³	15T+ 10T
MIXING TOWER	YES	YES	YES	YES	YES	YES
HOT AGGREGATE SCREENS	5	5	5	5	5	5
HOT AGGREGATE STORAGE	5bins - 20t total	5 bins - 19t Total	5bins + direct - 22t total	5bins + direct - 22t total	6 bins - 55t Total	5 Bins - 21T
SCREEN MOTOR SIZES	2 X 4.3KW	2 X 4KW	2 X 4.3KW	2 X 7.5KW		
SCREEN REFUSE BIN	YES - 1.5t	YES - 6t	YES - 1.5t	YES - 3.0t	YES	YES
HOT PRODUCT STORAGE	30t + 26t	2 X 35.5t	70 + 62 (140T)	2x50 + 2x55 (210t)	2x26t	2 x 50T
DIRECT DISCHARGE	4T	8t	8t	12T	8t	5T

SUPPLIER	Plant A MARINI - BE TOWER 2000	Plant B AMMANN - VALUE BATCH	Plant C MARINI - BE TOWER 2000P	Plant D MARINI - BE TOWER 2500	Plant E	Plant F
LOAD OUT PROGRAMMING	YES	YES	YES	YES	YES	YES
HOT BIN LEVEL INDICATORS	YES	YES	YES	YES	YES	YES
IMPORTED FILLER SILO	38m ³	40m3	38m3	38m3	40m3	30m3
LIQUID ADDITIVE SYSTEM	YES	YES	Not included	YES	YES	YES
FIBRES DOSING SYSTEM	YES	YES	YES	YES	YES	YES
RAP FEED	2 X 11m ³	2 X 8m ³	2 X 11m3	2 X 11m3	2	2 x 9m3
CONTROL CABIN	YES	YES	YES	YES	YES	YES
BITUMEN TANKS	3 X 60m ³ VERTICAL	3 X 60m ³ VERTICAL	3 X 60m ³ VERTICAL	3 X 60m ³ VERTICAL	3 X 60m ³ - VERTICAL	2 X 30m ³ VERTICAL
VERTICAL STIRRERS	3 INCLUDED	1 QUOTED	3 INCLUDED	3 INCLUDED	3 INCLUDED	2 INCLUDED
BITUMEN PIPING TO PLANT	YES	YES	YES	YES	YES	YES
SCREEN CRANE	YES	YES	YES	YES	YES	Not specified
ELECTRICAL CONTAINER	YES	YES	YES	YES	YES	NEED INFO
BLUE SMOKE FILTER / CONTROL	Ducted to burner/baghouse	Ducted to burner/baghouse	Ducted to burner/baghouse	Ducted to burner/baghouse	NEED INFO	NEED INFO
BLUE SMOKE TREATMENT SYSTEM	OPTION	NO	OPTION	OPTION	TBC	OPTION
WARM MIX CAPABLE	YES	YES	YES	YES	YES	YES
EPOXY CAPABLE	YES	YES	YES	YES	YES	NEED INFO
EMUSION CAPABLE	YES	YES	YES	YES	YES	NEED INFO
COVERED CONVEYOR	YES	YES	YES	YES	OPTION	OPTION
HEIGHT TO TOP OF STACK	22.355 METRES	27.500 METRES	24.765	25.05	29 METRES APPROX	14.5 Metres
HEIGHT TO TOP OF TOWER	19.345	22.838	22.42	27.605	TBC	20.8


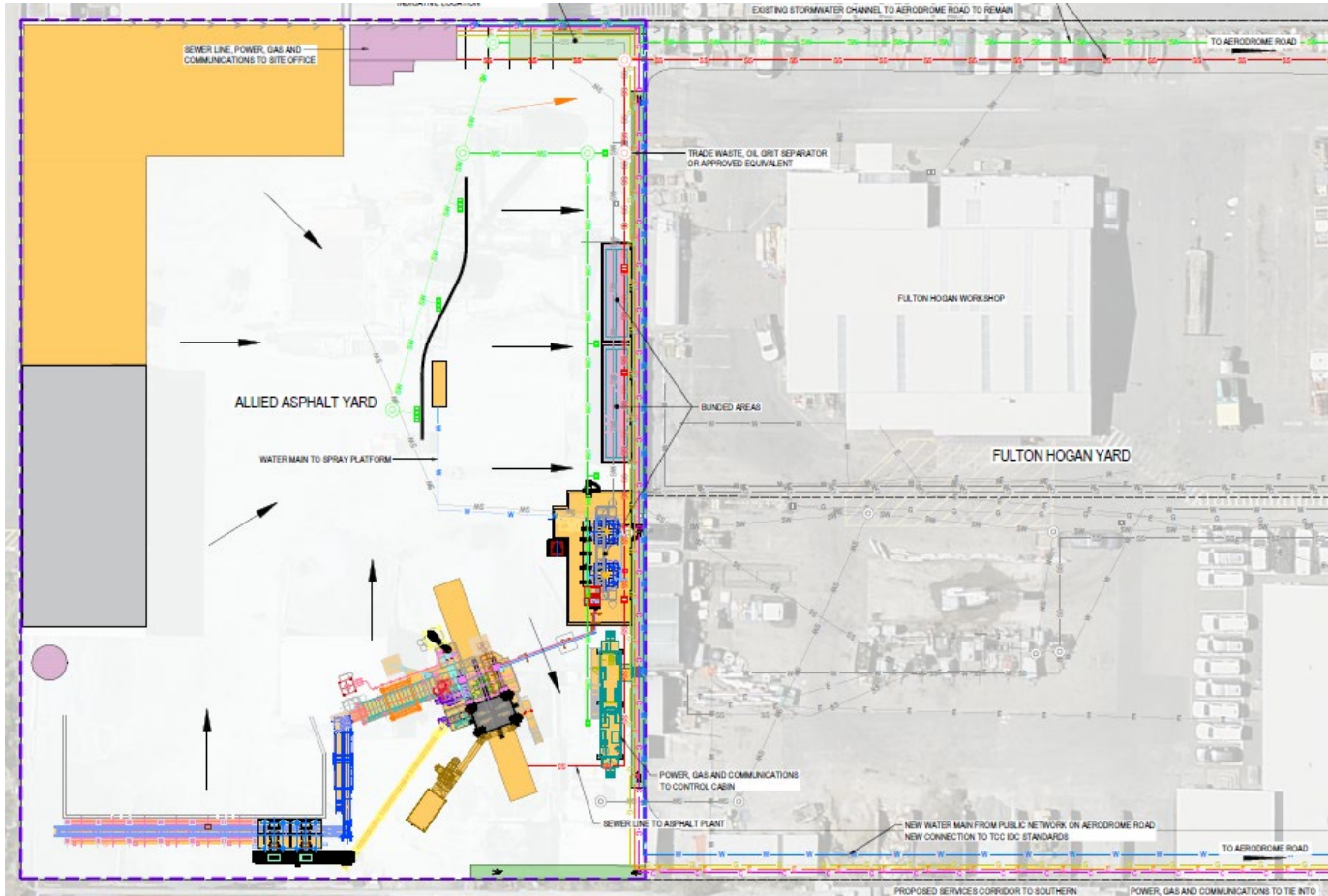
SUPPLIER	Plant A MARINI - BE TOWER 2000	Plant B AMMANN - VALUE BATCH	Plant C MARINI - BE TOWER 2000P	Plant D MARINI - BE TOWER 2500	Plant E	Plant F
NZ SEISMIC / WIND COMPLIANT	YES	YES	YES	YES	YES	NEED INFO
SKIP SYSTEM ENCLOSURE	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SHIPPING	40 x 40ft containers + bit tank break bulk	16 x 40ft containers + 1,267.52m ³ break bulk	40 x 40ft containers + bit tank break bulk	40 x 40ft containers + bit tank break bulk	NEED INFO	NEED INFO
HOT ASPHALT STORAGE	60T	75T	140T	140T	60T	100T
ADDITIONAL COLD FEEDER	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	
ADDITIONAL RAP FEEDER	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	
IMPORTED FILLER SILO	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	
FIBRE DOSING SYSTEM	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	
COUNTRY OF ORIGIN	ITALY	CHINA	ITALY	ITALY	GERMANY	INDIA
PLANT PERFORMANCE						
3% MOISTURE	160 TPH	180TPH	160TPH	200 TPH	160 TPH	120TPH
4% MOISTURE	136 TPH		160TPH	180 TPH	145 TPH	
5% MOISTURE	120 TPH	140TPH	160TPH	161 TPH		87TPH
RAP CONTENT	30%	40%	Up to 70%	Up to 70%	30%	40%
MIXING CAPACITY	2T	0.4T - 2.2T	2.0T	2.5T	0.5T - 2T	1.8T
HOT ASPHALT STORAGE	OVERNIGHT	OVERNIGHT	OVERNIGHT	OVERNIGHT	OVERNIGHT	OVERNIGHT
WARRANTY	24 MONTHS	12 MONTHS	24 MONTHS	24 MONTHS	12 MONTHS	TBC
NZ BASED PLANT SUPPORT	NO - AUSTRALIA	NO - AUSTRALIA	NO - AUSTRALIA	NO - AUSTRALIA	NO - AUSTRALIA	NO - AUSTRALIA
BAGHOUSE FILTRATION						
EXTRACTOR FAN CAPACITY	34,300 Nm3/h	37000 Nm3/Hr	41,805 Nm3/Hr	41,805 Nm3/Hr		
EXTRACTOR FAN MOTOR SIZE	90KW	90KW	90KW	90KW		

SUPPLIER	Plant A MARINI - BE TOWER 2000	Plant B AMMANN - VALUE BATCH	Plant C MARINI - BE TOWER 2000P	Plant D MARINI - BE TOWER 2500	Plant E	Plant F
STACK DIAMETER	950MM	1000mm	950MM	950MM		
VSD INSTALLED	YES	YES	YES	YES		
INSULATED	50mm MINERAL WOOL	50mm MINERAL WOOL	50mm MINERAL WOOL	50mm MINERAL WOOL		
FILTRATION SURFACE AREA	525m2	482m3	663 m2	663 m2		
NUMBER OF BAGS	350	Ammatex S	450	450		
FABRIC TYPE	ARAMID 400 g/m2	250g/Nm3	ARAMID 400 g/m2	ARAMID 400 g/m2		
FILTER SHAPE	OVAL	TBC	OVAL	OVAL		
LONGITUDINAL SCREW LARGER FINES MOTOR SIZE	5.5KW		5.5KW	5.5KW		
DOUBLE ELEVATOR FINES/RECOVERED FILLER	20m3/h		20m3/h	20m3/h		
ELEVATOR DRIVE MOTOR	5.5KW		5.5KW	5.5KW		
RECOVERED FINES SILO SIZE	20m ³	40m ³	23m3	23m3		
BAGHOUSE ABOVE DRYER Y/N	YES	NO	YES	YES		
PRESEPERATOR	YES	YES	YES	YES		
LONGITUDINAL SCREW MOTOR SIZE	5.5KW	3KW	5.5KW	5.5KW		
RAP SYSTEM						
RAP FEED HOPPERS	2	2	2	2		
RAP FEED HOPPER CAPACITY	11m3	8m3	11m3	11m3		
RAP FEED LOADING WIDTH		7.5KW	3.5M	3.5M		
RAP EXTRACTOR BELT			6-90 TPH	6-90 TPH		
RAP EXTRACTOR BELT MOTOR SIZE			2.2KW	2.2KW		

SUPPLIER	Plant A MARINI - BE TOWER 2000	Plant B AMMANN - VALUE BATCH	Plant C MARINI - BE TOWER 2000P	Plant D MARINI - BE TOWER 2500	Plant E	Plant F
RAP BUCKET ELEVATOR	150t/h		150t/h	150t/h		
RAP BUCKET ELEVATOR MOTOR SIZE				9.2KW		
COLD RAP WEIGH BELT	YES	YES	YES	YES		
COLD RAP INTO MIXER	YES	YES	YES	YES		YES
COLD RAP INTO DRUM COLLAR	NO	OPTION	OPTION	YES		
MAX RAP CONTENT	40%	30%-50% (With collar)	40%-70% (With collar)	40-70% (With Collar)		
RAP WEIGH BELT	400mm @ 306 t/h	650MM X 2.7m	400mm @ 306 t/h	400mm @ 306 t/h		
RAP WEIGH BELT MOTOR SIZE		2.2KW	2.2KW	2.2KW		
RAP CONVEYOR BELT	500mm X 20m @ 210tph	650mm X 22m	500mm X 20m @ 210tph	500mm X 20m @ 210tph		
RAP BUCKET ELEVATOR	150tph	120t/h				
RAP CHUTE CAPACITY	1.2t	1.5t				
BITUMEN TANKS AND PUMPS						
BITUMEN TANKS	3	3	3	3	3	2
VERTICAL/HORIZONTAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL
VOLUME OF TANKS	60m3	60m3	60m3	60m3	60m3	30M3
BITUMEN TANK STIRRERS	3	3	3	3	3	2
TANK DIAMETER	2.9m	2.9m	2.9m	2.9m		
EXTERNAL DIAMETER	3.4M		3.4M	3.4M		
HEATING	(12 X 1KW) + (1 X 25KW)	9KW + 23KW	(12 X 1KW) + (1 X 25KW)	(12 X 1KW) + (1 X 25KW)		ELECTRIC - 40KW
BITUMEN FEED PUMP	49m3/h @ 11KW	960l/min @15KW	49m3/h @ 11KW	49m3/h @ 11KW		
BITUMEN PUMP HEATING	ELECTRIC	ELECTRIC	ELECTRIC	ELECTRIC		

SUPPLIER	Plant A MARINI - BE TOWER 2000	Plant B AMMANN - VALUE BATCH	Plant C MARINI - BE TOWER 2000P	Plant D MARINI - BE TOWER 2500	Plant E	Plant F
BITUMEN PIPING TO PLANT	YES	YES	YES	YES		
BITUMEN WEIGH BIN	233KG		233KG	233KG		180KG
BITUMEN WEIGH BIN HEATING	(2 X 800W) + (1X 400W)	1000W	(2 X 800W) + (1X 400W)	(2 X 800W) + (1X 400W)		
BITUMEN FILLING PUMP						
GENERAL ITEMS						
BUILD LOCATION	ITALY	China	ITALY	ITALY		
CONTROL CABIN	YES	YES	YES	YES		
CONTROL CABIN DIMENSIONS	5.9m X 2.3m X 2.5m	6m X 2.4m X 2.8m	5.9m X 2.3m X 2.5m	5.9m X 2.3m X 2.5m		
CONTROL SYSTEM	CYBERTRONIC 500	AS1 WORKSTATION	CYBERTRONIC 500	CYBERTRONIC 500		
ELECTRICAL CONTAINER	YES	YES	YES	YES		
EXHAUST STACK MONITORING	NO	NO	NO	NO		
HEIGHT TO TOP OF STACK	22.355 METRES	27.500 METRES	24.765	28.077 M		
HEIGHT TO TOP OF TOWER	19.345	22.838	22.42	27.577 M	29m	
NZ SEISMIC / WIND COMPLIANT	YES	YES	YES	YES	YES - 2.0m/s earthquake & >30m/s base wind speed	
SKIP SYSTEM ENCLOSURE	AVAILABLE	NOT REQUIRED	AVAILABLE	AVAILABLE		
AIR COMPRESSOR PRESSURE	10 BAR	10 BAR	10 BAR	10 BAR		
AIR COMPRESSOR SIZE	15KW	15KW	15KW	15KW		
AIR DRYER MOTOR SIZE	TBC		1.04KW	1.04KW		
ELECTRIC HOIST	500kg	950kg	500kg	500kg		
Environmental Pollutant and sound emissions						
CHIMNEY						

SUPPLIER	Plant A MARINI - BE TOWER 2000	Plant B AMMANN - VALUE BATCH	Plant C MARINI - BE TOWER 2000P	Plant D MARINI - BE TOWER 2500	Plant E	Plant F
Dust			<20mg/Nm3	<20mg/Nm3		
Nox			<250 mg/nM3	<250 mg/nM3		
SOx			<1,700 mg/Nm3	<1,700 mg/Nm3		
CO			<500 mg/Nm3	<500 mg/Nm3		
O2			17% in combustion products	17% in combustion products		
BOILER CHIMNEY						
Nox						
Sox						
CO						
O2						
FILLER SILO FILTER						
DUST			<20mg/Nm3	<20mg/Nm3		
NOISE						
PLANT		68dB @100m	65dB @ 100m	65dB @ 100m		
BURNER		115 dB @ 1m	93dB @ 3m	93dB @ 3m		
BURNER SILENCER		REDUCTION 5-7 dB	REDUCTION 5-7 dB	REDUCTION 5-7 dB		
POWER						
INSTALLED POWER			422KW	432		
ADDITIVES			4.5KW	4.5KW		
BITUMEN			162KW	162KW		
WARM MIX			11KW	11KW		
EMULSION			7KW	7KW		
TOTAL POWER MAX 100%		TBC	606.5	616.5		

<div><div><div>allied asphalt limited</div><div>MANUFACTURERS OF ALL GRADES OF HOT BITUMINOUS MIXES</div></div></div>			<div>DRAFT Environmental Management Plan – Operational Summary</div>																				
Prepared By:		Reviewed By:		Approved By:		Date:		Revision		This is an uncontrolled copy if photocopied or printed from the Intranet. Copyright © 2016, Fulton Hogan Ltd. All rights reserved.													
<div>Scope</div> <div>This EMP – Operational Summary applies to all activities, operations and staff.</div>			<div>Related Documents</div> <div>The following documents are associated with this EMP:</div> <div><div>Plant Maintenance Check Sheets and PAM sheet - MAXIMO</div><div>Operational Hazard Register and Pre-start tailgates</div></div>			<div></div> <div>Site Layout and Drainage Plan</div>																	
<div>Responsibilities</div> <div>Particular responsibilities of note for the Plant include:</div> <div><div>Overall responsibility for Environment Management rests with the Operations Manager</div><div>Responsibility for the direction of onsite operations, including planning and management of the safety and environmental protection measures, rests with: the Plant Manager</div><div>Day to day management of the safety and environmental protection measures, inspections, monitoring and maintenance rests with: Plant Supervisor</div></div> <div>Advice on environment and sustainability matters and overview of consent compliance and reporting by: Safety, Quality and Environment Advisor</div>			<div>Communication of Requirements</div> <div>This EMP needs to be communicated to all staff and subcontractors to inform them of the safety and environmental requirements of working on the above site, by the following means:</div> <div><div><div>Display of this Plan in the Control Room and Plant Managers Office</div><div>Tailgate Meetings including Pre-start Tailgates</div><div>Staff and Subcontractor Inductions</div></div><div><div>Audit Reports</div><div>Leadership Actions</div><div>Opportunity for Improvement (OFI) forms</div></div></div>																				
<div>Requirements</div> <div>All work undertaken by Asphalt Plant personnel shall be undertaken in a manner which is compliant with:</div> <div><div>Company, Department and Site requirements</div><div>Legislative requirements including permitted activities and the following resource consents:</div><div>(consent # once granted) – Discharge to Air, (consent # once granted) (Stormwater) and (consent # once granted)</div><div>Hazard controls, Work Instructions</div><div>Health and Safety at Work (Hazardous Substances) Regulations 2017 compliance for storage and handling of hazardous substances</div></div> <div>Working in accordance with this EMP - Operational Summary will help you comply with these requirements.</div>			<div>Critical Resource Consent Compliance Monitoring, Recording and Reporting</div> <div>Staff working at the Plant shall be aware of the conditions of Resource Consent Discharge to Air (copy in Control Room). Plant processes at all times shall be operated, maintained, supervised, monitored and controlled so that emissions authorised by this consent are minimised.</div> <div>Monitoring, Recording and Reporting at the Plant shall be undertaken in accordance with:</div> <div><div>Consent (consent # once granted) and Asphalt Plant Air Quality Management Procedure (reference #) requirements</div><div>Plant Maintenance and Inspection schedule and checklists</div><div>Any identified non-compliances/deficiencies in controls must be fixed before any environmental impact can occur</div></div> <div>The following specific environmental compliance monitoring and reporting is required to meet legal requirements (add in once consents are granted):</div> <div><div>Any identified non-compliances / deficiencies in controls must be fixed before any environmental impact can occur and recorded.</div></div>																				
<div>Critical Manufacturing and Operations, Inspections and Maintenance</div> <div>Prior to & during manufacture of any asphalt the Plant Daily Check Sheet must be completed</div> <div><div>All plant and associated odour/smoke/dust controls must be implemented and monitored on a constant basis for their functions and operation</div><div>Manufacturing temperature must be maintained within specified manufacturing temperatures for each asphalt mix</div><div>Burner combustion efficiency is to be maintained and monitored during plant operations</div><div>Asphalt and RAP Plant sprinklers around stockpiles, feed bins and conveyors to be in operation during dry periods or as necessary to suppress dust</div><div>All items of the Asphalt plant identified as requiring maintenance (PAM) are to be serviced as scheduled</div></div>			<div>Community and Complaint Management</div> <div>The nearest residential neighbour is over 650m to the East. Particular issues of concern to neighbours are odour, dust and noise.</div> <div><div>All complaints are to be recorded</div><div>All external complaints from neighbours, clients or regulators shall also be recorded in the Community Complaints Register (kept by the SQE Advisor) and responded to</div><div>All odour complaints shall be investigated in accordance with the AQMP</div><div>Details of any complaints received shall be provided to Council within one working day of receipt of the complaint.</div></div>																				
<div>Environmental Hazards and Controls</div> <div>Noise</div> <div>Working Hours:</div> <div><div>Works at the Asphalt Plant can occur 24 hours of the day. Night noise is a key risk</div></div> <div>Noise Limits:</div> <div><div>The noise limits are set out by Council.</div></div>			<div>Discharges to Stormwater</div> <div>Sediment from aggregates and fuel, oil, chemical leaks and spills are the main risk to water quality</div> <div><div>Sediment is minimised via roofed storage and dust management methods (see Air Quality) and regular plant and yard sweeping</div><div>Vehicle washing on site to be in designated truck washes</div></div> <div>Stormwater Drainage and Treatment Systems:</div> <div><div>Stormwater from roofs and yard flows overland or via catchpits and pipes to a drainage system (refer Site Layout and Drainage Plan) and treated by sediment traps and a large sand filter opposite the main reception</div><div>Waste bins located away from stormwater drains and on sealed ground</div><div>Other waste sources eliminated</div><div>The Asphalt Plant catchpits have pumps to remove stormwater to the wider yard</div><div>Catchpits shall be checked weekly and cleaned out as required to prevent pump damage / malfunction</div><div>Sediment from catchpits can be added to the pre-screened RAP pile</div></div>			<div>Trade Waste Discharge</div> <div><div>Trade waste connection to asphalt plant weighbridge and bunded areas surrounding the bitumen and oil tanks where there is higher risk of contamination of stormwater.</div><div>Trade waste routed through a treatment device (oil and grit separator, or similar) to achieve the required discharge quality.</div><div>Treatment device maintained as required</div></div>			<div>Energy/GHG Emissions:</div> <div><div>All energy use data (gas, electricity, fuel oil, fuel) is logged via JDE and can be viewed on the Carbon Dashboard. An online system captures live electricity and gas usage</div><div>Plant maintenance (burner, compressor), stockpile moisture management and manufacturing temperature minimisation (where possible) are critical to minimising energy use</div><div>Improvements that can reduce energy use shall be raised at tailgate meetings and submitted on an OFI as a New idea</div><div>Loaders and diesel vehicles use biodiesel blend when refuelling from the yard pumps</div></div>			<div>Waste Minimisation and Energy Use</div> <div>Waste Minimisation Methods:</div> <div>The waste hierarchy AVOID- REDUCE- REUSE- RECYCLE will be used by the Plant. As a minimum the following shall apply:</div> <div><div>A co-mingle recycling bin located adjacent to the lunchroom</div><div>All steel is to be recycled via the scrap metal bin</div><div>Cardboard and plastic film wrap is recycled to the site cardboard / plastic cages at the Yard waste station</div><div>Empty drums / IBC's are either returned to the supplier for disposal or via a reputable disposal supplier</div><div>All used spill material is to be placed in the prescribed contaminated waste bin located at the Yard waste station</div><div>Other hazardous waste is disposed of in closed containers via the contaminated waste bin or through approved providers</div><div>No polystyrene cups are to be used</div><div>Gully traps walled off to prevent entry of stormwater runoff to sewer.</div></div> <div>Waste Storage and Disposal :</div> <div><div>Empty drums / IBC's should be stored in bunded areas until collection</div><div>Start-up / shutdown waste and waste asphalt from the silos is disposed of to the surge pile for reprocessing in the RAP Plant</div></div> <div>Sustainable Purchasing:</div> <div><div>Purchasing shall be from approved suppliers only</div><div>Products, materials and services should be manufactured and/or supplied by businesses that are committed to sustainability principles and their sustainability record should be sound</div><div>Waste is disposed of by contractors using "WasteTRACK" www.wastetrack.co.nz and those that are compliant with the "Liquid and Hazardous Waste Contractors Code of Practice"</div></div>			<div>Air Quality</div> <div>Plant Emissions.</div> <div>Bitumen odour from manufacturing, load-out, storage and deliveries along with unburnt fuel oil odours are the most significant Plant environmental risks:</div> <div><div>Emissions minimised by limiting manufacturing temperatures with bitumen foaming system and / or an additive. Spec sheets specify production temperature limits</div><div>The Blue Smoke evacuation system will be operational and ducted to the baghouse</div><div>Trucks are to cover/tarp product ASAP in a safe place before leaving the yard</div></div> <div>Dust Minimisation</div> <div>The baghouse, RAP Plant, crushing and aggregate stockpiles, deliveries, handling and transfer are potential sources of dust:</div> <div><div>Bag house filters checked and maintained / replaced as required</div><div>Dust return system operates to recycle dust from the baghouse</div><div>Loader to minimise drop heights of aggregates where practical</div><div>Weekly plant sweeping / cleaning to be undertaken</div><div>Yard is swept weekly or as required. Speed limit of 20 kph on site</div></div> <div>Dust Suppression:</div> <div><div>Sprinklers around stockpiles and feed bins operated automatically or by loader driver</div><div>Water cart on roadways to be used if necessary</div></div>			<div>Chemical Storage, Handling and Spill Management</div> <div>Chemical Storage:</div> <div><div>Managed according to the HSNO regulations</div><div>Inventory of Hazardous substances shall be maintained:</div><div><div>Raw materials.</div><div>Finished product.</div><div>Waste, by-products, materials for re-use or recycling.</div><div>Fuels, lubricants, cleaners and other non-process substances.</div></div><div>All fuels, oils and chemicals (including empty containers) shall be stored in correctly labelled containers with lids on and maintained in good condition.</div><div>Secondary containment of fuels, oils and chemicals through storage shall be in bunded areas / shipping containers, subject to regular inspection and maintenance.</div><div>Designated loading and unloading area shall be isolated from stormwater system</div><div>Stormwater in bunds shall be inspected prior to discharge to the yard or removed in accordance with Plant Procedures</div><div>Small storage containers (liquids, aerosols) shall be separated and stored in a cabinet</div><div>Safety Data Sheets shall be kept in the Control Room – use TheHub to update as required</div><div>Approved handler: update once appointed</div></div> <div>Spill Management:</div> <div><div>All spills (no matter what size) shall be managed in accordance with site Spill Procedures - be contained and cleaned up as soon as possible, disposed of into the contaminated waste bin and spill kits re-stocked</div><div>Spill kits are located next to workshop and the fuel bund</div><div>Any spills to be recorded on a CAMs case</div><div>All staff shall be trained in Spill Response</div></div>			<div>Bitumen and Fuel Oil Delivery and Storage:</div> <div><div>Bitumen delivery is via pipeline from the PE Plant (PME) or by tanker and trained personnel (bitumen) and guided by SOPs for offloading tankers (PPE, safety zones etc) only if required or emergency</div><div>Fuel oil delivery is by tanker</div><div>Staff to be in attendance during all loading/offloading operations</div><div>Storage and overnight heating – monitor all potential outlet sources for odour as necessary</div><div>Carbon filters to be maintained on tanks and register updated in control room</div><div>Monitor all valves/pipe work, tanks for leaks daily</div><div>Plant maintenance to be undertaken as per PAM schedule and Preventative Maintenance</div></div> <div>Lime deliveries</div> <div><div>Ensure Lime Bag House and Pulse Cleaning Air are operating and all spills are swept up afterwards</div></div> <div>Relevant Procedures</div> <div><div>RWASH0004 – Bitumen Tank Farm Operations</div><div>RWASH006 – Loader Checks and Tasks</div><div>RWASH008 – Spill Response</div></div>		