

## APPENDIX 10.3

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Noise Modelling Information

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## Appendix 10.3

### NOISE MODELLING INFORMATION

#### INTRODUCTION

This Technical Appendix document outlines the protocols and methodologies employed within the scope of the 3D acoustic modelling of the Enviroparks (Wales) Limited (EWL) Facility.

#### PREDICTION PROTOCOLS

The EWL facility is neither in situ or operational at the current time therefore, noise associated with the plant/ equipment associated with the facility has been assessed by means of a 3D noise model, constructed using the IMMI software.

Within the modelling exercise informing this study, acoustic propagation has been calculated in accordance with ISO9613-2: Acoustics – Attenuation of sound during propagation outdoors: Part 2: General method of calculation. The Immi software implements this methodology in full.

The prediction methodology of the ISO Standard takes account of wind and meteorological conditions in the following ways:

- Wind Direction – The software assumes a positive wind vector in all directions from the source to receptor.
- Humidity – 70%
- Temperature – 10°C

In addition, ground conditions are considered to be a 50/50 mix of soft and hard ground between the site and receiver locations.

#### FOUNDATION OF THE MODEL

The noise model was constructed utilising the following information:

- OS Open data mapping (TIFF format);
- Site layout plan and building height information supplied by Enviroparks Ltd
- Noise levels for the proposed plant and equipment provided by Biomass Power Ltd and fbw Engineering;
- HGV and vehicle movements associated with the site supplied by the traffic consultants on the project Envisage (Chapter 8).

#### MODELLING ASSUMPTIONS

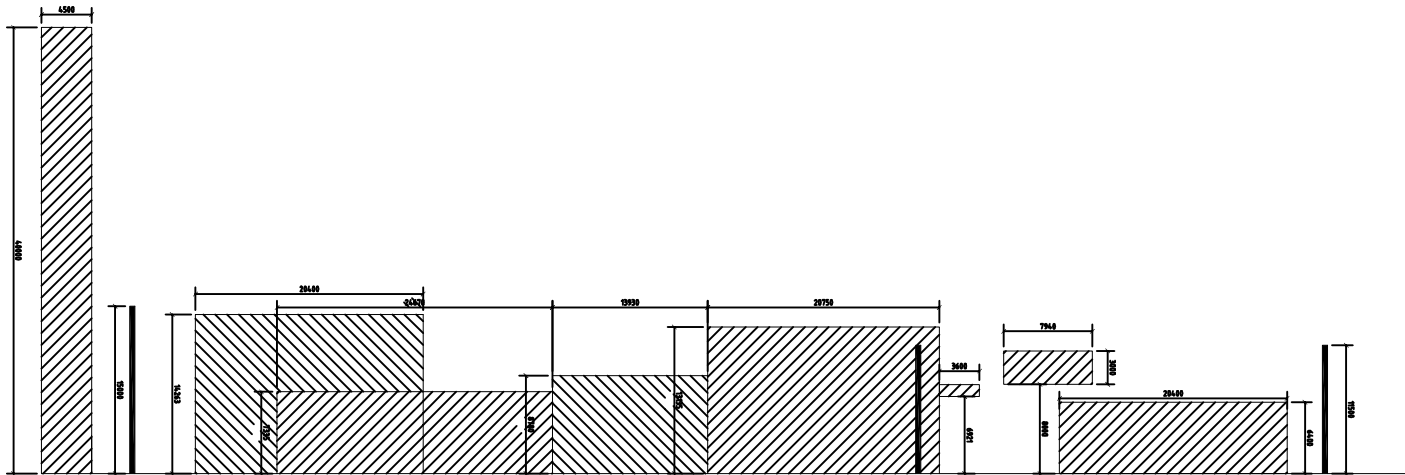
Within the construction of the noise model, certain assumptions have been required to be made due to incomplete information.

- Reverberant noise levels within the EWL buildings have been calculated through the summation of the internal noise level, corrected to give a reverberant internal noise level and attenuated for the reduction afforded by the façade and roof cladding elements. Within the scope of this assessment the facades are assumed to afford a minimum of  $R_w$  25dB and the roof is assumed to afford a minimum of  $R_w$  44dB. The shutter doors are assumed to provide a minimum of  $R_w$  15dB. The break out noise was modelled as point sources located in the middle of the facades;
- The roof fans on the Gasification Hall will be located within the building envelope and ducted to the roof through appropriate attenuators. The roof fans will generate no more than 75dB(A) at a distance of 1m per fan at the termination;
- The ACC fan unit located to the west of the Gasification Hall will generate no more than 70dB(A) at 1m from the unit;
- The steam ducting routed to the ACC fans will be clad so as to achieve a noise level not exceeding 70dB(A) at 1m from the duct;
- The DAC fans will be enclosed to the north and west by a 3.5m acoustic barrier. The barrier should provide a minimum surface density of  $10\text{kg/m}^2$  and be lined on the internal facing with acoustically absorbent material;
- The process water and gas booster stations should be acoustically robust and afford a minimum noise reduction of 25dB. This could be achieved by providing a 0.8m steel enclosure or a typical brick/ block enclosure though care should be taken when locating ventilation points and access panels;
- The standby diesel generator should generate no more than 75dB(A) at a distance of 1m from the unit. This would include noise from the exhaust system and any supply/ extract fans. The noise source in this instance is located on top of the proposed container, at a height of 2.5m above local ground;
- Onsite HGV movements assume a maximum of 18HGVs progress through the site during a typical 1 hour daytime assessment period. HGV movements are limited to daytime hours, 08:00 to 18:00hrs;
- It has also been assumed within the calculations that the sound power level of an HGV under acceleration is 105.5dB as stipulated as a maximum permitted value in EC directive 92/97/EC. This value has been corrected within the model in accordance with the haul road methodology of BS5228 to take account of the number of vehicles per hour, the speed of the vehicles (16kmph/ 10mph) and the distance between the source and the receiver
- All off site buildings are assumed to be 6m high from local ground height.

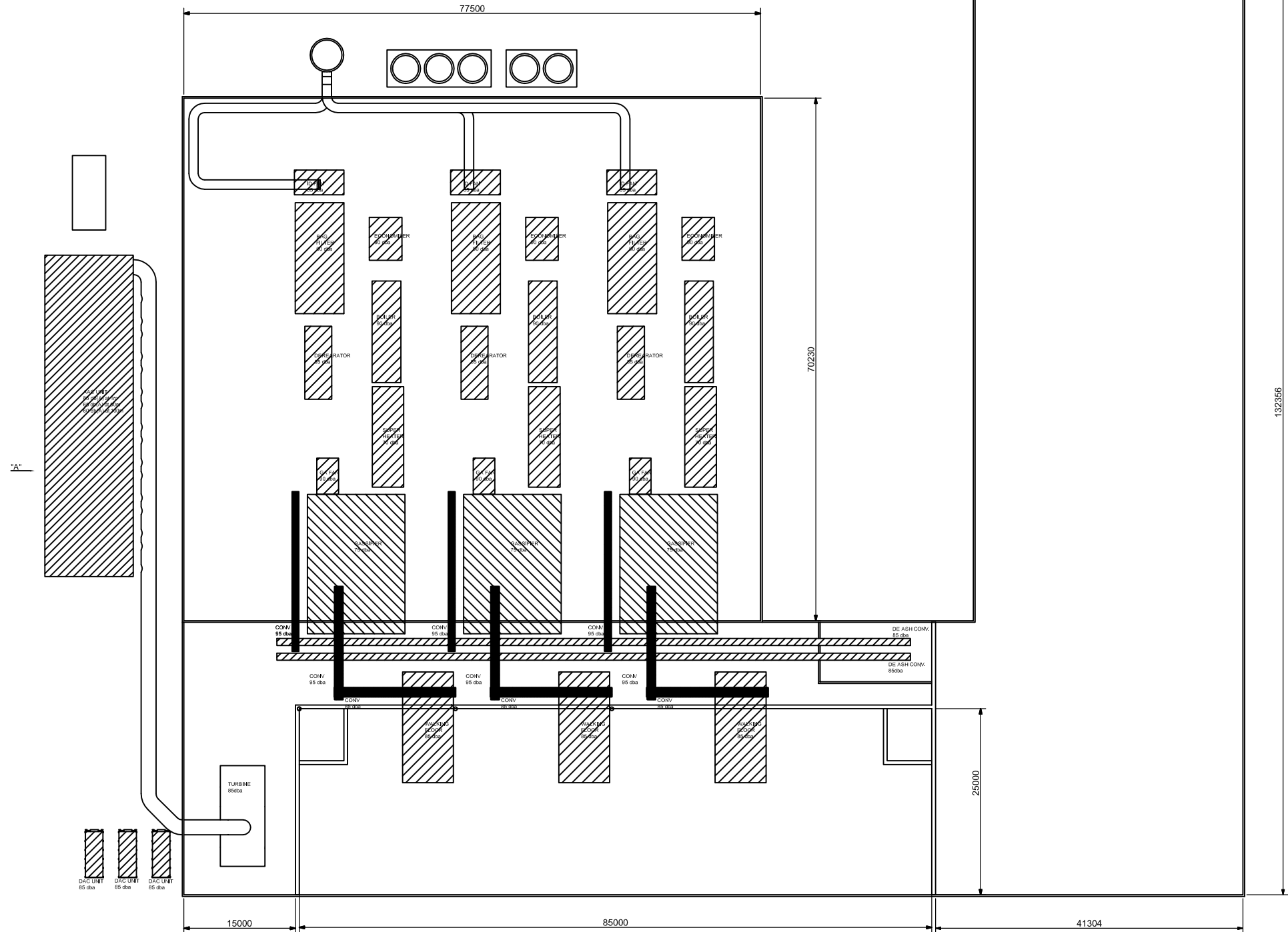
To confirm, the following noise sources were used within the noise modelling assessment:

<i>Noise Source</i>	<i>Location</i>	<i>Number of units</i>	<i>Noise Level, dB</i>	<i>On time Correction</i>	<i>Notes</i>
Air Cooled Condenser (ACC) fans	External, to the west of the gasification hall	1ACC Unit (Divided in to 3 point sources within the model)	70dBA at 1m	N/A	Unit is assumed to operate at 100% for both the daytime and overnight assessment periods.
Steam Ducts	Exits the turbine hall and routes to the ACC units	1 duct (forks to either side of the ACC unit)	70dB(A) at 1m	N/A	
Dry Air Cooler (DAC) fans	Located to the west of the turbine hall	3 units	61dB(A) at 10m	N/A	Noise mitigation fence located to the west and south
Gasification hall roof fans	Located within the gasification hall roof	16	75dB(A) at 1m	50% on time during the night	fans to be ducted to the outside through appropriate attenuators
Process water station	Located to the west of the gasification hall	1	52dB(A) L <sub>WA</sub>	N/A	Located within a suitably robust enclosure
Gas booster station	Located to the west of the gasification hall	1	52dB(A) L <sub>WA</sub>	N/A	Located within a suitably robust enclosure
Standby diesel generator	Located to the west of the turbine hall	1	75dB(A) at 1m	N/A	Located in a suitably robust enclosure/ ISO container

The internal noise sources within the gasification hall, turbine hall, fuel store and the waste reception/ fuel preparation area are presented on the figures appended below:

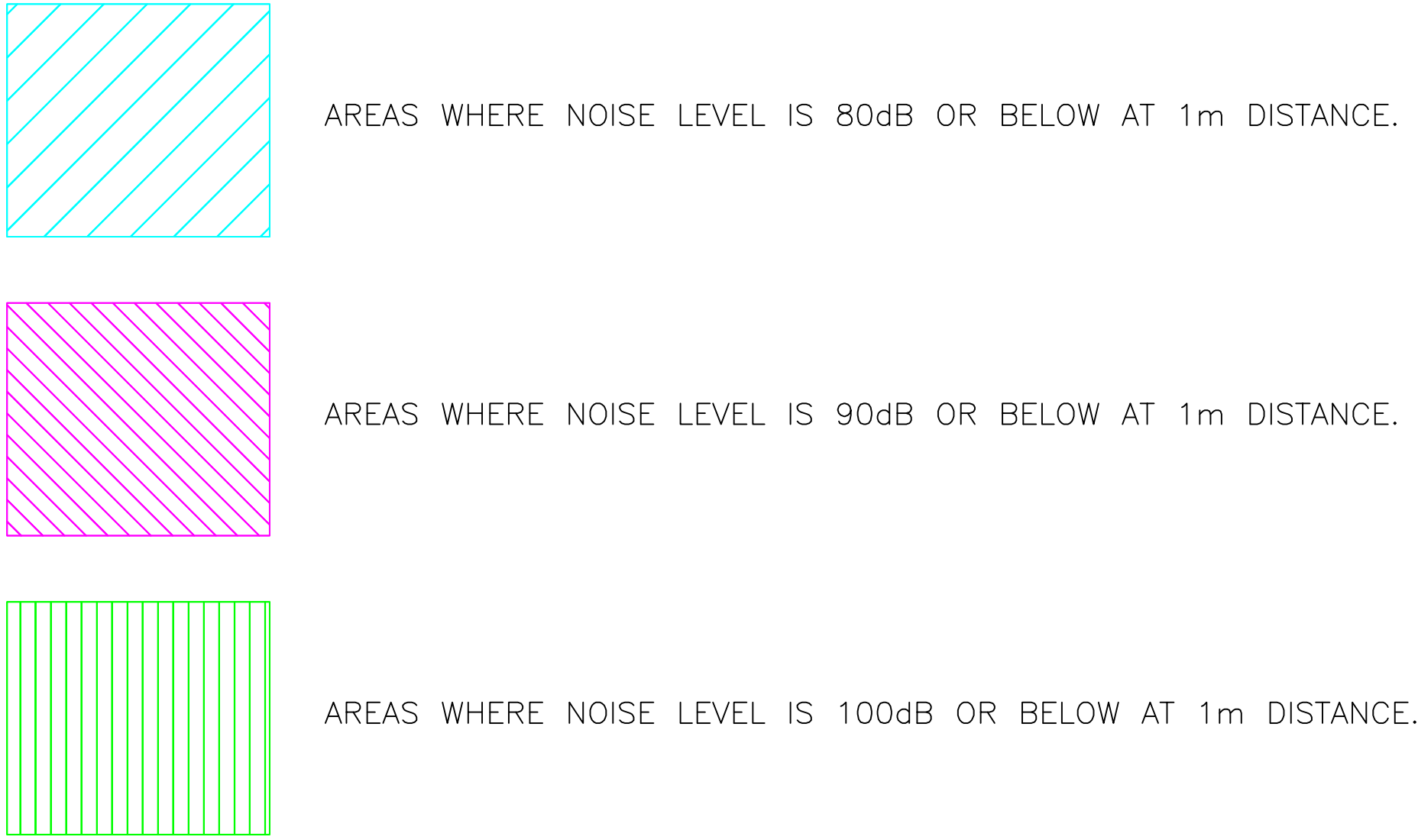
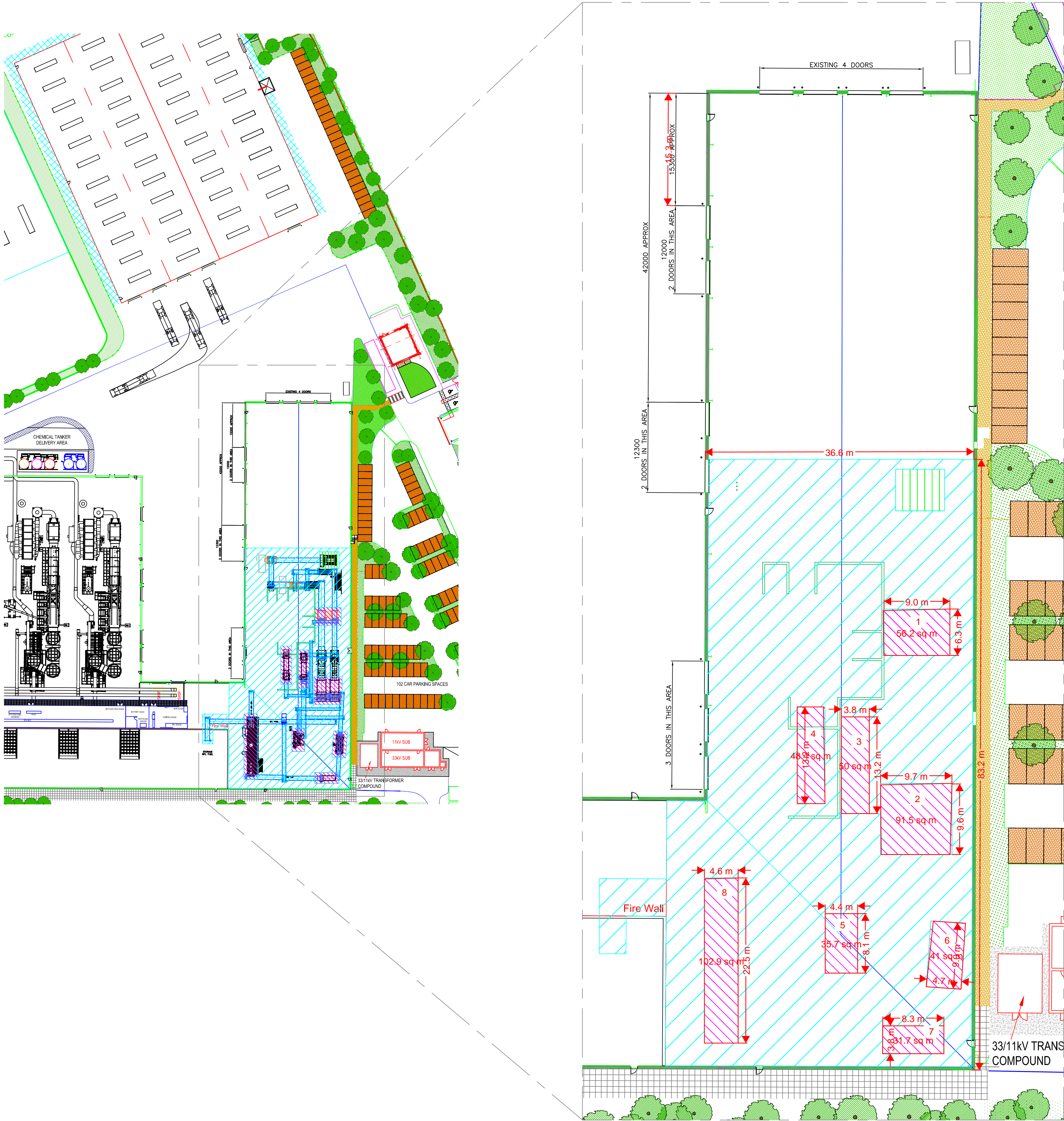


VIEW ON ARROW 'A'



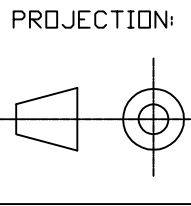
This Drawing is a Private & Confidential Communication and must not be copied or Disclosed to a Third Party without the Written Consent Of Biomass Power Ltd	Reference Drawings		Tolerances		The following tolerances are to be used unless otherwise stated on the drawing.		General Notes (Unless stated otherwise on the drawing)		Painting Instructions		REVISION HISTORY					PROJECT   ENVIOPARKS, HIRWAUN INDUSTRIAL ESTATE		
	General Steel Fabrications up to 2 metres General Steel Fabrications over 2 metres Hole Centres Castings Casting Minimum Radii	±2 ±3 ±1 ±3 3	Untoleranced Machined Parts-Dimensional -Angular -Finish	±0.25 ±1 ±2	All items to be square, true to dimensions given and free from twist and distortion. All welds to be ..... mm continuous unless otherwise stated. Weld symbols are in accordance with BS EN 22553:1995/ISO 2553:1992 End preparation for welding to be in accordance with BS 5135:1984.	All Mild Steel material to be in accordance with BS EN 10025:1993 GROUP S275 Eg Tensile Strength of 410-550N/MM2 and Minimum Yield Strength of 275N/MM2 dependant on material thickness. Machined surfaces to be coated with Shell 'Ensis' Grade ..... or equivalent before despatch.	Assembly Mass		REV	DESCRIPTION	BY	CHK'D	APP	DATE	TITLE			
									A	BLOCK SPACES CREATED	A			02.11.16	PROPOSED FPA & GASSIFICATION BLOCK SPACE AND NOISE DRAWING			
									B	NOISE LEVELS ADDED	B			03.11.16				
									C	UPDATED ACC UNIT	C			22.11.16				
									D	GENERAL UPDATE	D			13.12.16				
	Site Embedded Steel Levels	±2	Site Concrete and Paved Levels	±6					Revision Block Notes		Design/Pre Manufacture allocate Letters Eg. A Approved for Manufacture allocate Numbers Eg. 1					Biomass Power Ltd, Lichfield Road, Stafford, Staffordshire, ST17 4BQ, England. Tel: 44 (0) 1785 240092 Fax: 44(0) 1785 240462		
									Third Angle		Projection		Date	02/11/2016	Drawing No.	REV		
													Drawn	SM	Scale	1 : 50	J1602-GEN-0-600-003	D
													Checked					





GENERAL TOLERANCES WHERE NO LIMITS ARE SHOWN			
	UN.	M/C	M/C
0 TO 100	±0.75	±0.25	
OVER 100 TO 300	±1.5	±0.5	
OVER 300 TO 1000	±2.0	±0.9	
OVER 1000 TO 2000	±2.25	±1.2	
OVER 2000 TO 4000	±3.0	±1.6	
OVER 4000	±3.5	±2.3	

DRAWN: M.J.C.	DATE: 22/01/16
ISSUED: [Signature]	CHECKED: [Signature]
BY: [Signature]	SCALE: N.T.S.



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**Northamptonshire, NN14 2WD.**  
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TITLE: WASTE RECEPTION HALL NOISE LEVEL AREAS		DRAWING NUMBER 24319NRA
PROJECT: Q24319	CUSTOMER: ENVIROPARKS	

REV	BY	CHANGE	GRID	DATE
B	DPF	LAYOUT AMENDED		20/12/16
A	DPF	FIRST ISSUE		06/12/16