



**Independent Acoustic
Consultancy Practice**

Noise Impact Assessment

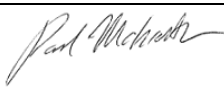
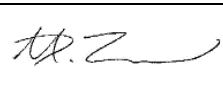
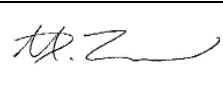
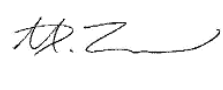
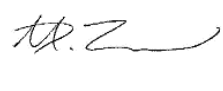
**Sandvik Osprey Industrial Unit
Margam**

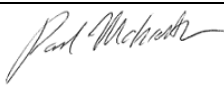
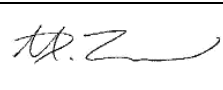
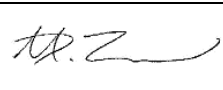
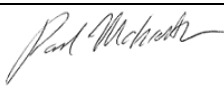
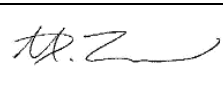
6160/NIA1_PRELIM_Rev6

Noise Impact Assessment

Project:	Sandvik Osprey Industrial Unit
Site Address:	Land of J38 Margam SA13 2NR
HA Reference:	6160/NIA1_PRELIM_Rev6
Date:	10/06/2022
Client:	Sandvik Osprey Red Jacket Works Milland Road Neath SA11 1NJ
Contact:	stephen.gibbs@sandvik.com

ISSUE / REVISION

Rev	Date			
P0	31 August 2021	Filename	21.6160_NIA1_PRELIM	
		Description	DRAFT ISSUE – FOR COMMENT	
			Prepared by:	Checked by:
		Name	Paul McGrath BSc(Hons) MIOA	Meirion Townsend BSc(Hons) MIOA
		Signature		
P1	30 September 2021	Filename	21.6160_NIA1_PRELIM_R1	
		Description	Revised Issue, following receipt of drawings	
			Prepared by:	Checked by:
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		Signature		
P2	01 November 2021	Filename	21.6160_NIA1_PRELIM_R2	
		Description	Revised Issue – including cooling tower, transformers and revised Service Filter locations	
			Prepared by:	Checked by:
		Name	Paul McGrath BSc(Hons) MIOA	Meirion Townsend BSc(Hons) MIOA
		Signature		
P3	02 November 2021	Filename	21.6160_NIA1_PRELIM_Rev3	
		Description	Revised Issue – updated transformer noise	
			Prepared by:	Checked by:
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		Signature		

P4	03 November 2021	Filename	21.6160_NIA1_PRELIM_Rev4	
		Description	Corrections / clarifications	
			Prepared by:	Checked by:
		Name	Paul McGrath BSc(Hons) MIOA	Meirion Townsend BSc(Hons) MIOA
		Signature		
P5	31 January 2022	Filename	22.6160_NIA1_PRELIM_Rev5	
		Description	Revised Entrance	
			Prepared by:	Checked by:
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		Signature		
P6	10 June 2022	Filename	22.6160_NIA1_PRELIM_Rev5	
		Description	Revised HGV & Car Park assessment	
			Prepared by:	Checked by:
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		Signature		

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1. INTRODUCTION

Sandvik Osprey are to develop a new industrial site at Land off J38 M4, Margam, SA13 2NR. The site comprises 6ha and is allocated under Policy EC1/2 of the Neath Port Talbot LDP as a Strategic Employment Site.

It is proposed to construct a new metal / alloy powder processing facility (Use Classes B1, B2 and B8) - similar to Sandvik Osprey's existing facility in Neath - to operate 24-hours a day, 5 days a week.

A 7-day environmental noise survey has been undertaken covering weekday and weekend periods to assess the existing noise climate at the nearest sound sensitive receivers. Results of this survey have been used as the basis for setting project noise criteria in line with current planning guidance and relevant standards. The ambient and background noise levels at the existing sound sensitive receivers is controlled by existing industrial sites, as well as distant A48 and M4 road traffic.

Source plant noise measurements have also been taken at Sandvik Osprey's existing facility in Neath. Results of these surveys have been used as the basis for an acoustic model, calculating sound insulation performance requirements of the main factory building fabric to meet the agreed environmental noise limits, as well as assessing external ventilation plant.

Assessments of external operations including HGVs accessing/leaving the factory and staff cars to/from the car park at shift change are also included.

This report covers operational noise impact only. A construction noise impact assessment is covered under a separate report.

Acoustic Terminology used in this report is given in Appendix A.

2. SOUND SENSITIVE RECEIVERS

Figure 2.1 below shows the development site and the closest existing sound sensitive receivers (SSRs) highlighted in **YELLOW** in each direction. Surrounding industrial uses are also highlighted for context, including:

- BOC Gas & Gear Margam (well-established)
- Western Bio Energy Power Station (operational from 2008)
- Margam Green Energy Power Station (constructed 2018, operational 2019)
- Tata Steel Works, 700m in the distance (well-established)

Figure 2.1 – Site Plan Showing Nearest SSRs



Table 2.1 – Nearest Sound Sensitive Receivers

Description	Approx. Distance (m)
Tyn y Caeau, 2-Storey residential dwelling to the north-east	Adjacent to site boundary Approx. 20m
Longland House (1 Heolcae'r Bont) 2-Storey residential dwelling to the south	Adjacent to site boundary Approx. 10m
Greenacres (2 Heolcae'r Bont) 2-Storey residential dwelling to the south	Approx. 70m from site boundary

3. NOISE SURVEYS

3.1 Long-term Background Sound Monitoring

Hunter Acoustic undertook week-long continuous background sound monitoring at the nearest residential receivers in May 2021. EIA Scoping Report 6160/EIA1 dated 02/06/21 details full survey methodology and results.

Results of ambient and background sound levels measured are summarised below:

Table 3.1 – Summary Ambient $L_{Aeq,15min}$ Sound Levels

Period	Date	Position	
		A	B
Daytime L_{Aeq} (dB) *	19/5 – 26/5/2021	58	56
Night-time L_{Aeq} (dB)	19/5 – 26/5/2021	56	56

*average value over the monitoring period

Table 3.2 – Summary Background $L_{A90,15min}$ Sound Levels

Period	Date	Position	
		A	B
Daytime L_{A90} (dB) *	19/5 – 26/5/2021	50	51
Night-time $L_{Aeq,8hr}$ (dB) *	19/5 – 26/5/2021	46	48

Ambient and background sound levels at the SSRs are controlled by continuous industrial sources. Subjectively, the dominant sources appear to emanate from processes on the BOC site, with some contributions from chiller plant and other plant at Western Bio Energy both during the day and night, keeping night-time noise levels elevated.

Road traffic noise from the A48 and M4 also contributes, however as there is no line of sight to the M4 as this is in a cutting, and road traffic on the A48 is not continuous, road traffic noise is not indicated significant. There are also very occasional vehicle pass-bys on Heolcae'r y Bont.

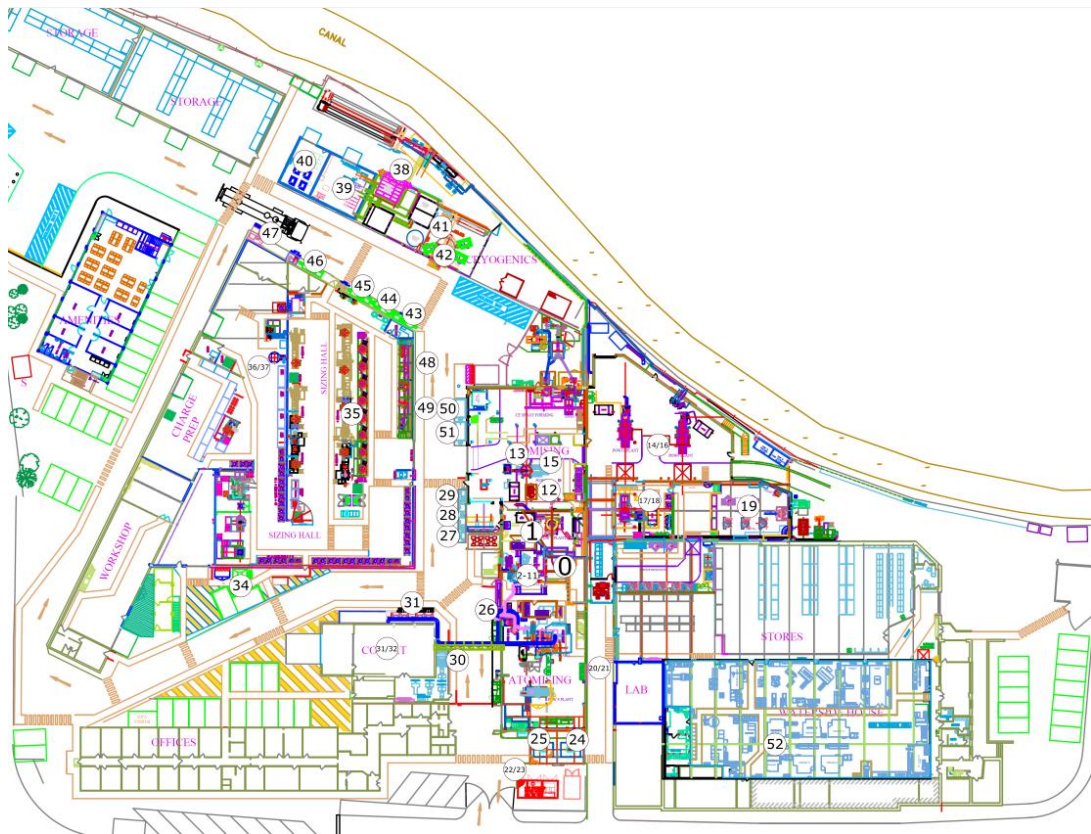
Referring to daily time history charts, ambient and background sound levels are generally consistent during the day and night.

3.2 Source Sample Noise Monitoring at Sandvik Osprey, Neath

3.2.1 Procedure

Sample measurements have been taken of Sandvik Osprey's existing operations at their Neath premises, including internal process and external plant and yard activity. Sample noise measurements were carried out on Tuesday 22nd July 2021 during the working day.

Figure 3.1 - Neath Site Plan Showing Measurement Positions



3.2.2 Equipment

The following measurement equipment was used during the surveys:

Table 3.3 Equipment List

Make	Description	Model	Serial Number	Last Calibrated	Certificate No.
NTi	Type 1 - Sound Level Meter	XL2-TA	A2A-10021-E0	17 August 2021	TCRT21/1568
	Preamplifier	MA220	5435	17 August 2021	TCRT21/1568
	Microphone	Capsule	8547	17 August 2021	TCRT21/1568
Rion	Calibrator (94.03dB @ 984Hz)	NC-73	10355197	01 June 2021	UCRT20/1265

3.2.3 Meteorological Conditions

Weather conditions during the survey was warm, dry and calm. Weather conditions are therefore not indicated to adversely affect external measurements taken.

3.2.4 Results

Table 3.4 below shows overall L_{Aeq} and L_{Amax} levels measured at the existing Neath factory. Table B.1 in Appendix B includes full third-octave band spectra data.

Table 3.4 - Sample Measurement Results

Position	Description	Distance from source (m)	Duration (mm:ss)	L_{Aeq} (dB)	L_{Amax} (dB)
0	Atomsing: POWs 4, 5 6 & 7 Idling	Room Average	01:18	77.7	79.8
1	POW6 Idling	1m	00:20	77.9	79.0
2	Atomsing: POWs 4, 5 6 & 7 Idling First Floor	Room Average	00:11	83.7	84.5
3			00:10	82.6	83.4
4			00:10	81.9	82.6
5			00:12	82.8	83.5
6			00:10	83.4	84.1
7			00:10	81.8	82.5
8			00:11	82.1	82.9
9			00:10	80.3	81.0
10			00:10	81.4	82.1
11			00:10	82.6	83.2
12	POW8 Idling @ First Floor	1m	00:10	81.6	82.5
13	POW8 Idling @ Ground Floor	1m	00:10	79.7	82.9
14	POW9 Atomising @ Ground Floor		00:35	100.2	101.9
15	POW8 Idling @ First Floor	1m	00:30	84.0	87.3
16	POW9 Idling @ Ground Floor, including alarm	5m	01:00	84.4	95.5
17	POW11 Idling @ First Floor	1m	00:10	81.9	82.6
18	POW11 Idling @ Ground Floor	1m	00:31	81.3	84.9
19	Furnace Prep Room	Room Average	00:30	67.2	68.6
20	Wall Louvres & Condensers	2m	00:30	74.0	79.5
21	Metal Banging Break-out from Atomising	2m	00:08	75.2	81.5
22	Lorry pass by	5m	00:10	74.7	77.2
23	Wall Louvres - Atomising Building	5m	00:10	73.2	74.3
24	Wall Louvre - Atomising Building	1m	00:05	85.4	86.4
25	Wall Louvre - Atomising Building	1m	00:05	85.5	86.1
26	POW Exhaust Ventilation Plant	1m	00:20	75.0	79.4
27	POW Exhaust Ventilation Plant	1m	00:10	80.0	81.9
28	POW Exhaust Ventilation Plant	1m	00:10	77.9	79.3
29	POW Exhaust Ventilation Plant	1m	00:10	78.0	79.1
30	POW Exhaust Ventilation Plant	1m	00:10	78.8	81.0
31	Cobalt Plant Dust Extract	1m	00:10	85.1	86.0
32	Cobalt Building (Vacuum Off)	Room Average	00:52	84.2	93.3
33	Cobalt Building (Vacuum On)	Room Average	00:35	84.5	92.5
34	Blender/Sieve/Classifier Building Exhaust Ventilation Plant	1m	00:30	79.0	85.1
35	Classifiers & Sieves	Room Average	01:00	86.1	88.1
36	Blender Area	Room Average	01:00	78.7	89.2
37	Blender Packaging	Room Average	00:25	81.1	84.9
38	Cryogenics: 2no external fans	1m	00:37	92.7	94.2
39	Cryogenics: Pump Room	Room Average	00:30	86.8	88.6
40	Cryogenics: Compressor Room	Room Average	00:20	77.2	79.1
41	Cryogenics: External Pump	1m	00:10	85.1	85.9
42	Cryogenics: External Pump	1m	00:06	82.1	82.8
43	Sieve & Classifier Exhaust Ventilation Plant	1m	00:05	78.6	79.0
44	Sieve & Classifier Exhaust Ventilation Plant	1m	00:05	85.0	86.4
45	Sieve & Classifier Exhaust Ventilation Plant	1m	00:05	86.7	87.8
46	Sieve & Classifier Exhaust Ventilation Plant	1m	00:05	81.8	82.7
47	Sieve & Classifier Dust Extract	1m	00:05	83.1	83.8
48	Wall Louvre	1m	00:05	75.8	76.7
49	Wall Louvre	1m	00:05	77.2	78.9
50	POW Exhaust Ventilation Plant	1m	00:05	75.1	78.3
51	POW Exhaust Ventilation Plant	1m	00:06	76.6	77.7
52	Production Area: Mazak 2 (+ Roof extract fans)	1m	01:00	75.4	78.6

4. ENVIRONMENTAL NOISE CRITERIA

A noise rating level 5dB below the pre-existing background L_{A90} sound climate, at the SSRs is proposed in line with the requirements of Pol05 of BREEAM2018. This should ensure that the operational noise impact is unlikely to have an adverse impact, based on BS4142:2014+A1:2019 guidance.

This should also mean that absolute L_{Aeq} noise levels are not increased – it is understood that on the neighbouring Biomass development the Local Authority specified no increase in existing noise levels.

Based on measured background sound levels, the following operational noise criteria are therefore indicated, to be applied at the nearest residential SSRs:

Table 4.1 – Operational Noise Limits

Period	Noise Rating Level, dB $L_{A_{rTr}}$ *	
	Longlands House Greenacres	Tyn y Caeau
Daytime (0700-2300hrs)	45	46
Night-time (2300 – 0700hrs)	41	43

* $L_{A_{rTr}}$ to be determined in accordance with British Standard 4142:2014+A1:2019.

5. PRELIMINARY NOISE IMPACT ASSESSMENT

5.1 Proposed Operations

Figure 5.1 below shows the proposed site layout.

Figure 5.1 - Proposed Site Layout



5.1.1 Main Building

The main noisy indoor processes measured at the existing facility – atomising and sizing – are to be located in the western section of the main building. Low noise activities are indicated in the middle section. Phase 2 at the eastern end of the building is to allow for future expansion, and we are advised that this is likely to contain sizing activities.

Full height concrete walls are proposed between noisy Atomising/Sizing Halls and quieter warehouse/stores; therefore the building noise model covers only the Atomising/Sizing Halls.

5.1.2 External Plant

Service Filters (Ventilation and dust extract plant), as measured at the existing facility, are to be located along the western elevation along with 9no transformers, maximising screening and distance losses to the nearest SSRs.

Additional transformers are located in the Substation Compound, on the southern boundary and near the proposed Office Building.

It is understood that external Cryogenics plant as well as high level wall vents, which were measured at Neath, are not to be included in the Margam site proposals.

Cooling Tower plant to be confirmed. At this stage the model is based on the cooling fans measured at Neath. This can be considered worst case, as the quieter Cooling Towers are proposed to be selected.

5.1.3 *HGV Movements*

We are advised that 10no HGVs per day between 0800-1800hrs are expected, allowing for a maximum of 2no HGVs in any one hour.

Up to 3no night-time HGV visits a day could be expected, up to 2 accessing the main loading area on the eastern side of the building, and one Argon delivery tanker accessing the Argon tank on the western side of the building away from SSRs.

HGVs to access from the north-western HGV-only entrance, away from SSRs. The site speed limit is set at 5mph for all vehicles including HGVs. HGVs with high level stack exhausts would not used.

HGVs are to reverse into the loading dock on the eastern side of the building and the roller doors are to seal tightly around the trailer, minimising noise break-out from the building and unloading activities which take place internally. No unloading is to take place in the external yard.

HGVs are likely to use reversing alarms as they enter the loading dock. This is likely to be limited to very short periods however.

5.1.4 *Car Park*

There are three car parks on the scheme total 170 spaces: a 62-space Office Staff car park, and a 98-space Shop Floor Staff car park, and a 10-space contractor car park.

The following anticipated car park usage is has been advised:

Office Car Park: 50 cars entering 0730-0900hrs, and leaving 1530-1700hrs

Shop Floor Car Park: Shift change at 0600hrs, 1400hrs, and 2200hrs
50 cars per shift (changeover 100cars):
0515-0630hrs; 1315-1430hrs; 2115-2230hrs

Car parks to be accessed from northern Work Staff, Contractors and Visitors entrance, with access road running past Tyn y Caeau.

5.2 [Preliminary] Main External Building Fabric Review

The proposed building is to be a steel portal frame with lightweight external cladding.

At this stage, we have based our initial assessment on basic R_w 25dB wall and roof cladding constructions.

The initial model indicates there is little or no margin with regards to break-out noise, both with normal processes L_{eq} levels, and with occasional L_{max} levels during Atomising.

An upgraded wall and roof cladding section is therefore recommended as follows

5.2.1 Walls & Roof

The external wall and roof cladding shall achieve the following octave band sound reduction performance, based on an R_w 34dB rated Kingspan 150mm Rainspan cladding;

Table 5.1 - Wall / Roof Cladding

Element	Description	Sound Reduction Index, R (SRI: BS EN ISO 140) at Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
External Wall/ Roof	150mm Rainspan	21	25	29	33	31	34	50	(50)

The above minimum figures are based on an INSUL prediction:

Figure 5.2 – Rainspan INSUL Prediction

Sound Insulation Prediction (v7.0.6)

Program copyright Marshall Day Acoustics 2012

- Key No. 2517

Margin of error is generally within $R_w \pm 3$ dB

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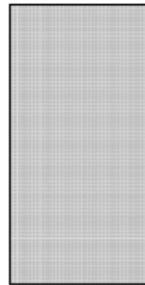
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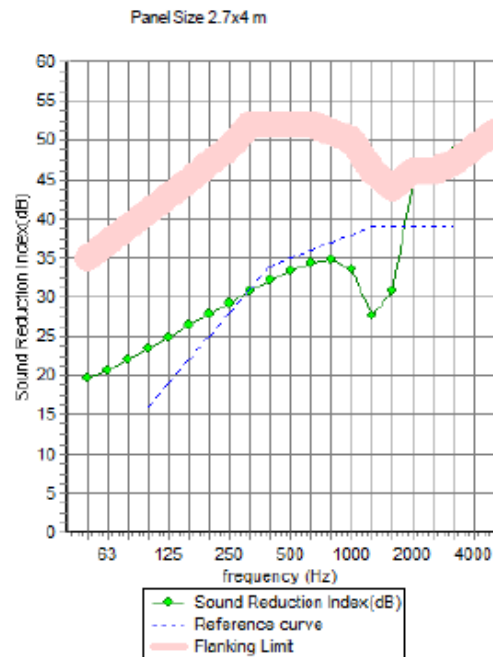


R_w 34 dB
C -2 dB
 C_{tr} -4 dB

System description

Panel 1 Outer layer: 1 x 150.0 mm Rainspan- ($m=27.9$ kg/m², $f_c=25000$ Hz, Damping=0.01) Profile

frequency (Hz)	TL(dB)	TL(dB)
50	20	
63	21	21
80	22	
100	23	
125	25	25
160	26	
200	28	
250	29	29
315	31	
400	32	
500	33	33
630	34	
800	35	
1000	34	31
1250	28	
1600	31	
2000	45	34
2500	47	
3150	49	
4000	50	50
5000	52	



5.2.2 Roller Shutter Doors

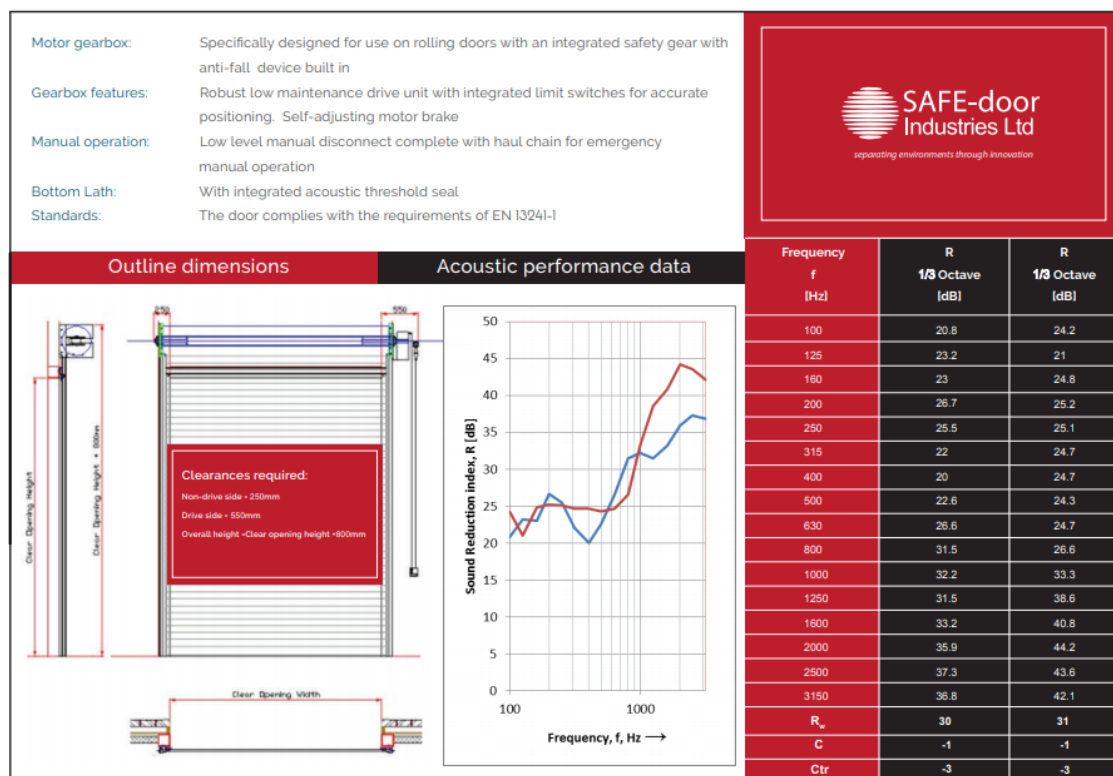
At this stage, an upgrade is indicated to be required to the proposed large roller shutter doors to the Furnace Prep* - which is facing towards Tyn y Caeau receiver.

**It is assumed that Atomising and Sizing noise levels would spread through the whole eastern building section, including Furnace Prep. The Furnace Prep was a separate Room from the Atomising plant at Neath as was significantly quieter, so the upgrade to the roller door could be reviewed.*

Roller shutter doors to Warehouses and Stores also face Tyn y Caeau. If the western section of the building is not fully partitioned off from the production area the upgraded roller shutter door performance would be required here also.

Two options could be considered:

- 1) A single roller shutter door, rated at a minimum R_w 30dB, based on Safedoor:



- 2) A lobbied / double roller shutter

An R_w 22dB / lobby / R_w 25dB shutter door system. We have modelled an R_w 22dB profiled metal sheet with an R_w 25dB insulated panel to represent an overall R_w 35dB combined door performance:

Table 5.2 - Roller Shutter Doors

Element	Description	Sound Reduction Index, <i>R</i> (SRI: BS EN ISO 140) at Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
R _w 22/ Lobby/ R _w 25	Overall R _w 35	24	30	32	32	31	46	63	(63)

5.3 Noise Map Analysis

Our analysis has used the proprietary NoiseMap Five (5.1.6) computer modelling software, in conjunction with procedures of;

BS 5228: Parts 1 & 2 2009 'Code of Practice for assessing noise and vibration on construction and open sites'.

This model allows noise levels from noise sources to be predicted over large distances and varying terrain. Attenuation is included accounting for distance, air absorption, ground absorption and screening losses from site topography/local structures. The analysis predicts resultant noise levels at the SSRs.

5.3.1 Plant Noise Source Input into Model

Source noise data for the various activities assessed are detailed below:

- Main Building [Western Section only] containing Atomising & Sizing plant, flat roof modelled at 15.5m above local ground height. Noise Map has been calibrated to meet the calculated noise break-out levels for sections of wall (including doors) and roof.
 - North & South walls (Atomising): 46dB(A) @10m / 29dB(A) @100m
 - North & South walls (Sizing): 47dB(A) @10m / 30dB(A) @100m
 - West Wall (Atomising): 41dB(A) @10m / 28dB(A) @100m
 - East Walls (Sizing): 48dB(A) @10m / 33dB(A) @100m
 - East Roller Shutter Door: 43dB(A) @10m
 - Roof (Atomising): 43dB(A) @10m
 - Roofs (Sizing): 42dB(A) @10m

In addition, for an initial Atomising L_{max} assessment through the building fabric, around a 10-15dB difference is indicated through the main wall & roof cladding sections, and a +10dB difference through roller shutter door.

- 18no external Service Filters (Atomising & Sizing Extract Ventilation Units) located along the western elevation
- 13no Bowers Electric BE5640 4000kVA 50Hz Transformers <64dB(A) @0.3m
 - T1 & T2 located in Substation Compound, T3 – T11 located along western elevation of main production building, T13 next to Office Building
 - T12 at southern boundary is to be housed within a GRP enclosure with no mechanical ventilation.

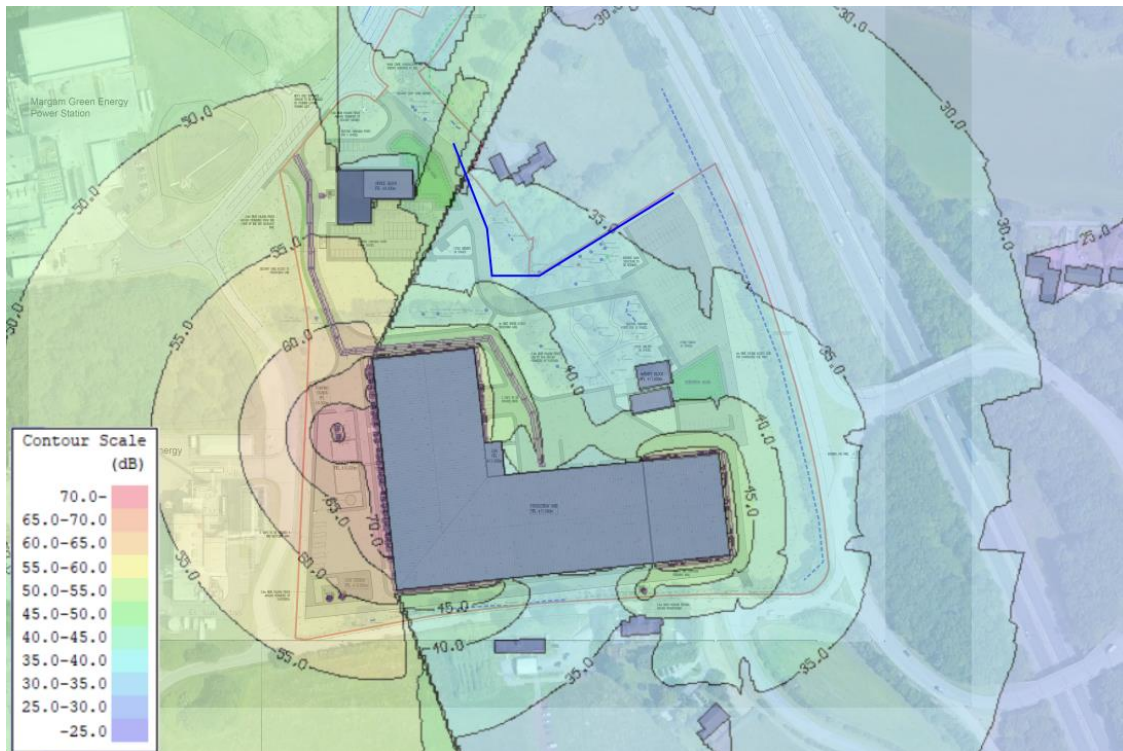
- Cooling Tower – located north of the services area – source noise levels based on existing Cryogenic extract fans measured at Neath.
- 4no HGV movements along access road in 1-hour daytime period; no more than 1no HGV movement in any 15-minute night-time period. HGV moving at 5mph modelled at 85dB L_{wA}

Daytime and night-time HGV assessments are therefore the same.

5.3.2 L_{Aeq} Noise Map Assessment

Figure 5.3 below shows daytime and night-time $L_{Aeq,T}$ levels predicted to the closest residences from main factory noise break-out through the uprated cladding, and external sources and HGVs on the access road, discussed above.

Figure 5.3 - L_{Aeq} at 4.5m above Ground Level



Results of the assessment are summarised in Table 5.3 below;

Table 5.3 – Predicted L_{Aeq} Levels at SSRs

Sound Sensitive Receiver (SSR)	Main Building & Fixed Plant $L_{Aeq,T}$ (dB)	HGVs $L_{Aeq,T}$ (dB)	Predicted Overall Level at First Floor Level $L_{Aeq,T}$ (dB)
Tyn y Caeau	35	26	35
Longlands House	39	0	39
Greenacres	34	0	34

Main Building and Fixed plant noise sources are indicated to be below the proposed criteria. There is a 2dB margin at Longlands House – contributing noise sources are indicated to be: Phase 2 South wall – 35dB(A)

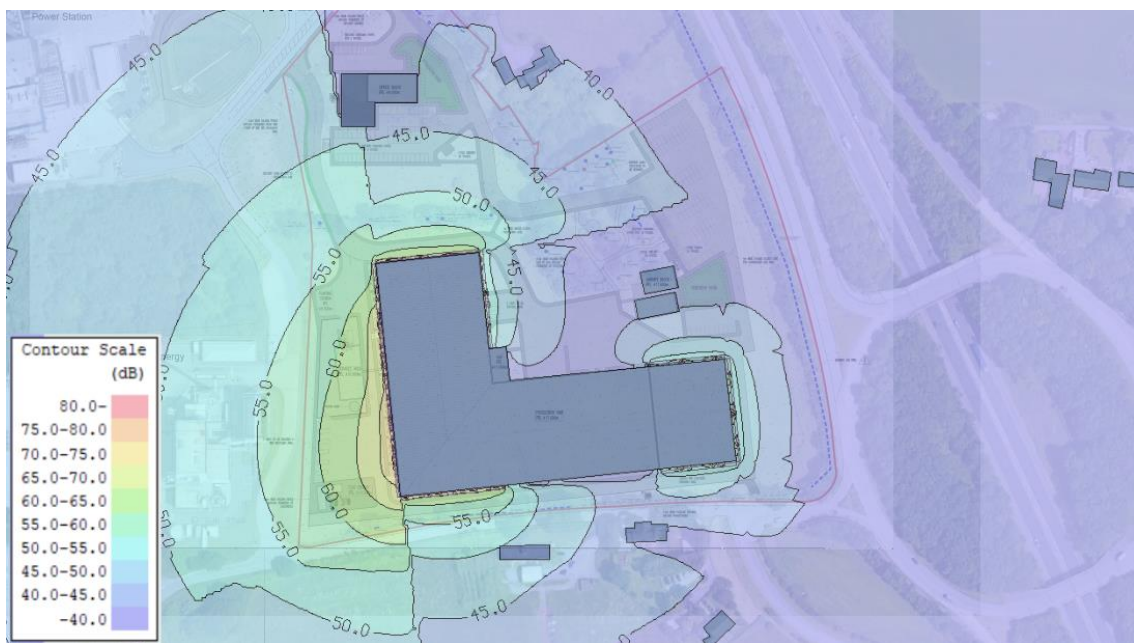
This sound source is well below measured ambient and background sound levels [ref Table 3.1 & Table 3.2], and any tonal content is therefore considered unlikely to be perceptible. No additional penalties are included and the proposed night-time criteria is indicated to be met at Longlands House.

The proposed daytime and night-time criteria are indicated to be met at Tyn y Caeau, even allowing for possible tonal/impulsive penalties from occasional HGV reversing beepers.

5.3.3 L_{Amax} Noise Map Assessment

Figure 5.4 below shows estimated daytime and night-time $L_{Amax,F}$ levels at the closest residences from Atomising Pouring noise break-out through the uprated cladding.

Figure 5.4 - L_{max} at 4.5m above Ground Level



Results of the assessment are summarised in Table 5.4 below;

Table 5.4 – Predicted $L_{Amax,F}$ Levels at SSRs

Sound Sensitive Receiver (SSR)	Atomising (Main Building) $L_{Amax,F}$ (dB)
Tyn y Caeau	43
Longlands House	42
Greenacres	39

Noise levels from Atomising pouring are indicated to fall below 45dB $L_{Amax,F}$, indicating a low noise impact.

5.4 Car Park Noise Impact Assessment

The critical receiver for the Car Park Noise Impact Assessment is Tyn y Caeau.

The assessment compares (L_{Aeq}) noise levels from the new car parks with the existing (L_{Aeq}) ambient noise climate. Referring to Table 3.1 ambient noise levels are consistent at 56dB $L_{Aeq,15mins}$.

At this site car park, the majority of movements occur at defined periods as staff arrive for and leave from shifts. Proposed daytime assessment period is 1-hour; night-time / early morning assessment period is 15-minutes.

The following impact assessment is proposed, based on figures given in *Design Manual for Roads and Bridges*, 2008, for road traffic.

Noise change, $L_{A10,18h}$	Magnitude of Impact
0	No change
0.1 – 0.9	Negligible
1 – 2.9	Minor
3 – 4.9	Moderate
5+	Major

The scale or severity of any noise change, positive or negative, requires description to indicate the degree of impact. Significance criteria are then applied to categories of change. A change threshold of 3dB has commonly been used in traffic noise assessments in the UK to approximate the threshold of significance.

Significance criteria shown in the table below have been developed based upon DMRB to assess noise effects arising from the operation of the proposed development.

Table 5.5 – Significance Criteria based upon DMRB

Change in noise level L_{Aeq} (1-hour) (dB)	Magnitude criteria	Significance
>5.0	Major Adverse	Significant
3.0 to 4.9	Moderate adverse	
1.0 to 2.9	Minor Adverse	Insignificant
0.1 to 0.9	Negligible	
0	No Change	
-0.9 to -0.1	Negligible	
-2.9 to -0.1	Minor Beneficial	
-4.9 to -3.0	Moderate Beneficial	Significant
> -5.0	Major Beneficial	

Table 5.6 below shows Hunter Acoustics database figures for source car parking activities measured at 10m.

Table 5.6 – Source Data for Car Parking Activities Measured at 10m

Position	L_{Aeq}	L_{Amax}	Period
Car Start and take off (including door open/shut)	65	67	22
Car Stop (including door open/shut)	63	64	13
Car Pass-by (15kph)	55	60	13

These source figures have been used to set up a noise map predicting car park noise to neighbouring residential receivers. The model is based on the scenarios described in Section 5.1.4

5.4.1 Mitigation

The applicant has committed to provide screening which removes line of sight from Tyn y Caeau first floor level to the car park access road, as well as along the boundary of Shop Floor Staff Car Park to mitigate the overall noise impact from the car parks.

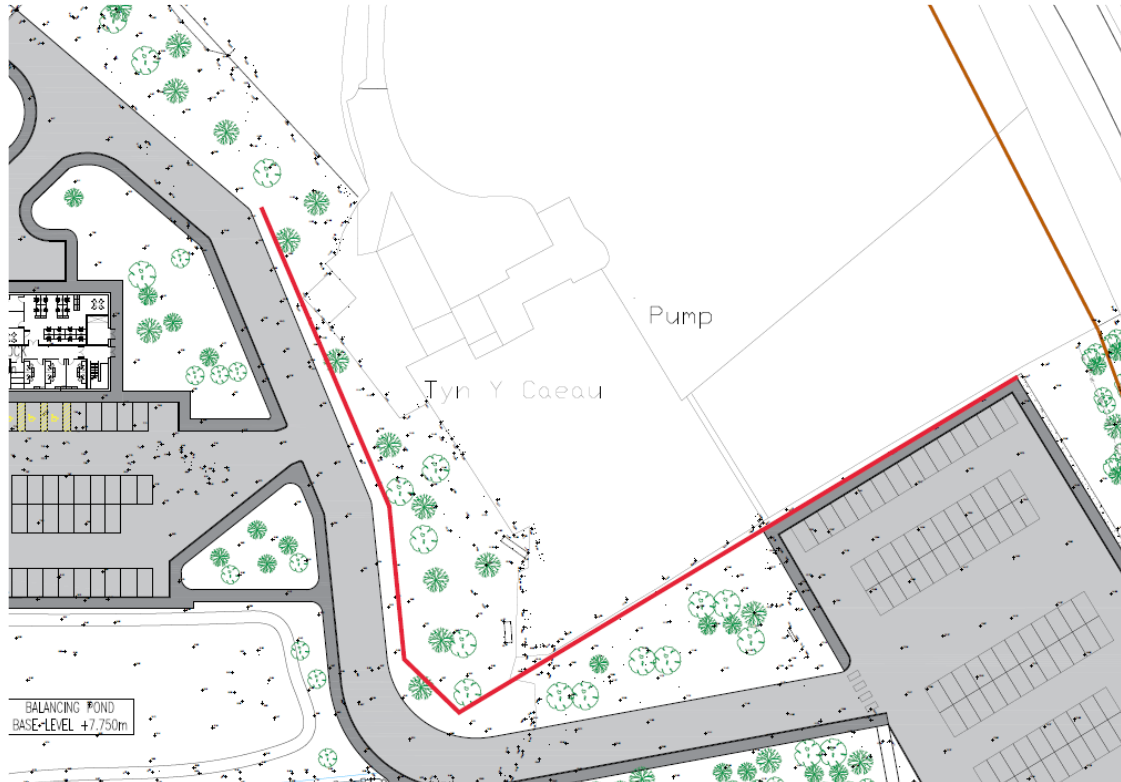
Screening could take the form of a landscaped earth bund or a solid structure (wall or close board timber fence).

An initial minimum height of 2.5m is indicated. However, the final height should be confirmed with detailed cross sections confirming line of sight is removed from first floor level at Tyn y Caeau to the car park / access road.

Timber fences shall typically comprise a standard close board timber fence with overlapped panels. Close board fence sections shall achieve a minimum mass per unit area of 10kg/m² (typically 20-25mm thickness), imperforate, vermin and rot proof and able to withstand wind forces.

A possible location is highlighted in red below:

Figure 5.5 - Possible Screening Location



This fence is shown in BLUE on the following noise models.

5.4.2 Office Car Park

90-minute periods are anticipated for Office Car Park arrivals and departures. At this stage for a robust assessment a scenario of all 50 Cars arriving / leaving within the hour assessment period.

Figure 5.6 and Figure 5.7 below show noise map predictions for Office Car Park arrivals and departures. Results are summarised in Table 5.7

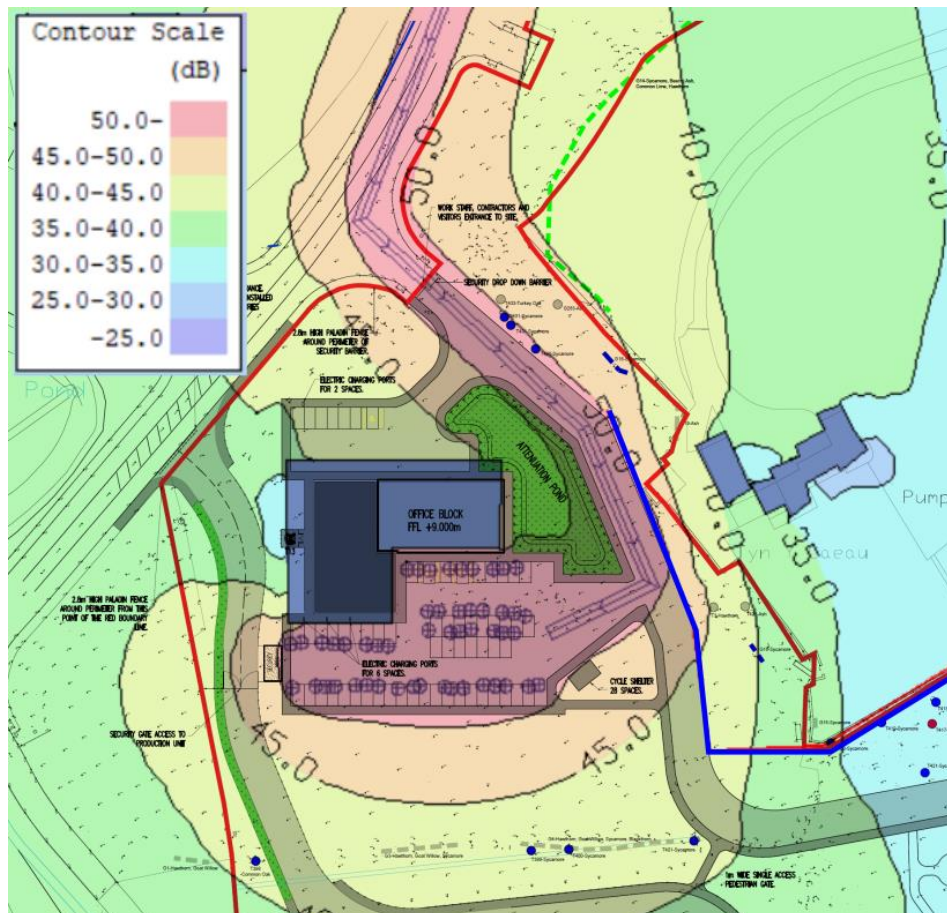
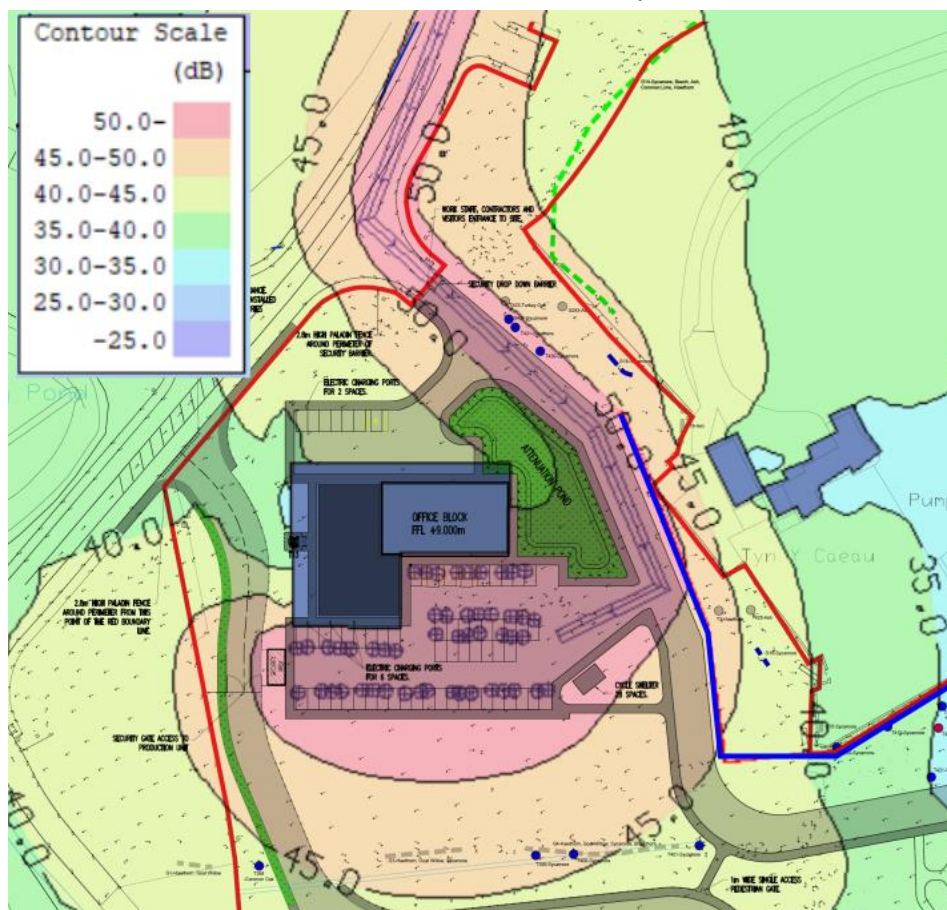
Figure 5.6 - Office Car Park – Arrivals, $L_{Aeq,1hr}$ Figure 5.7 - Office Car Park – Departures, $L_{Aeq,1hr}$ 

Table 5.7 – Predicted Office Car Park Levels at SSR

Sound Sensitive Receiver (SSR)	Cars Arriving $L_{Aeq,1hr}$ (dB)	Cars Leaving $L_{Aeq,1hr}$ (dB)
Tyn y Caeau	35-40	35-40

5.4.3 Shop Floor Staff Car Park

Our assessment has concentrated on the 0600hrs shift change.

45-minute periods are anticipated for Shop Floor Staff arrivals, with 30-minute periods for departures. At this stage for a robust assessment a scenario of all 50 Cars arriving / leaving within 30 minutes; i.e 25 cars in a 15-minute assessment period. We have also modelled the 25 cars across the northern section of the car park for a robust assessment.

Figure 5.8 and Figure 5.9 below show noise map predictions for Shop Floor Staff Car Park arrivals and departures. Results are summarised in Table 5.8.

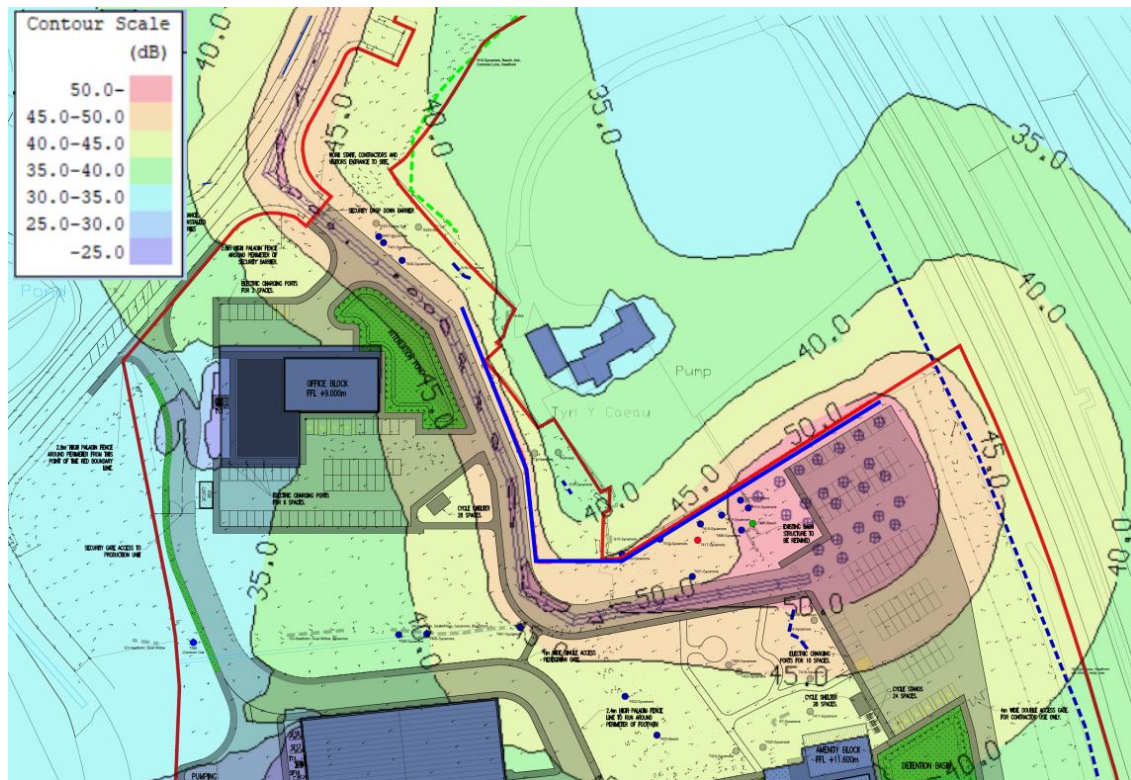
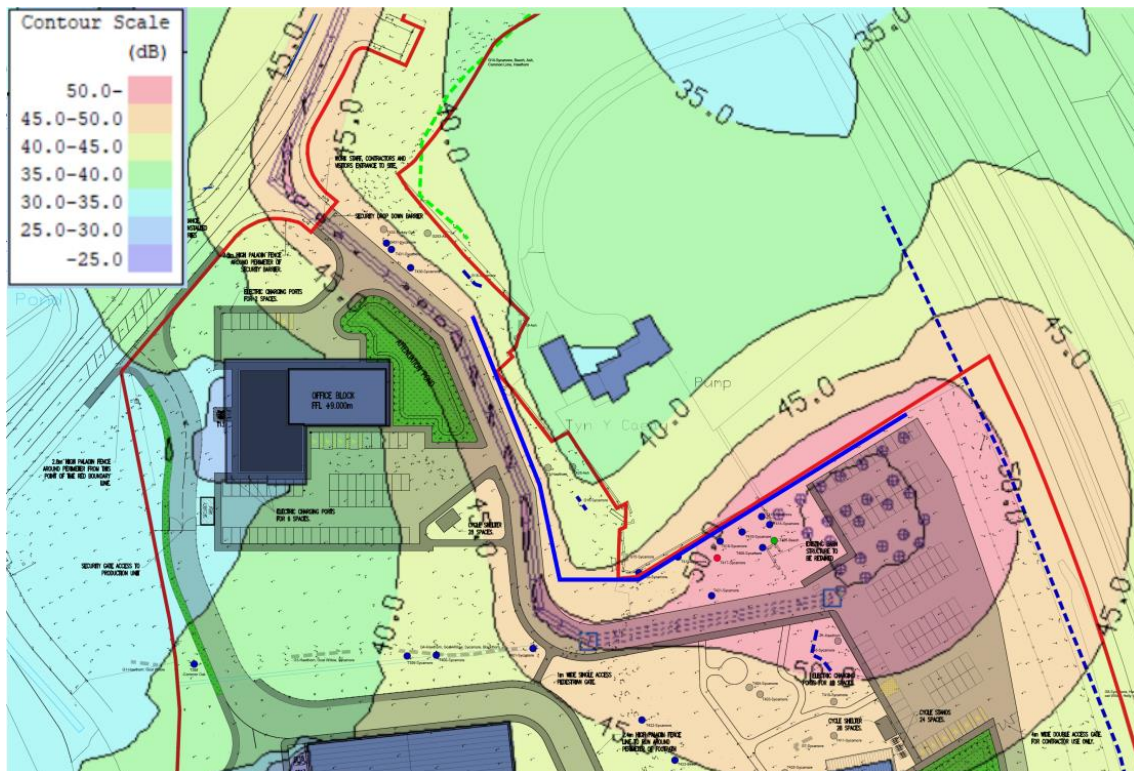
Figure 5.8 - Shop Floor Car Park – Arrivals, $L_{Aeq,15mins}$ 

Figure 5.9 - Shop Floor Car Park – Departures, $L_{Aeq,15mins}$ **Table 5.8 – Predicted Shop Floor Car Park Levels at SSR**

Sound Sensitive Receiver (SSR)	Cars Arriving $L_{Aeq,1hr}$ (dB)	Cars Leaving $L_{Aeq,1hr}$ (dB)
Tyn y Caeau	35	38

5.4.4 Overall Assessment

Car park noise levels predicted at up to $40dB L_{Aeq,T}$ are at least 15dB below the existing prevailing ambient noise level of $56dB L_{Aeq,T}$, and therefore a 0dB change is indicated. Noise impact of car parks is assessed as insignificant, based on DMRB methodology and existing ambient noise levels.

In the overall context of the development, for the periods of car park use, particularly the early morning shift changeover, noise levels are at least no more than 3dB higher than factory noise break-out levels, and are below the $43dB L_{Ar}$, overall noise criteria based on measured background sound levels.

6. GOOD PRACTICE/BEST AVAILABLE TECHNIQUES (BAT)

BS5228-1:2009 gives general information on the control of noise at source. A summary of the practical measures in the choice and use of plant to reduce noise is given below:

- Avoid unnecessary revving of engines and switch off equipment when not required.
- Ensure plant and vehicles are properly maintained, check silencers and bearings.
- If the noise is directional, point the source away from noise-sensitive locations.
- Keep internal haul routes well maintained. Avoid steep gradients and sleeping policemen/speed humps or bumpy haul roads to minimise noise from trailers jolting/dropping.
- Limit the use of particularly noisy plant or vehicles.
- Start-up plant and vehicles sequentially rather than together.
- Ensure the plant and vehicles are operated with noise control hoods closed.
- Residents should be given a contact name and number for the site to contact should there be an issue.
- Keep Roller Shutters & Doors closed – except for very short periods to allow HGVs to enter the dock. Roller doors are to close tightly around the trailer during unloading.
- Broadband reversing alarms should be fitted to all mobile plant on site which are to operate externally. (It is understood that mobile plant to operate indoors and that no unloading or forklift movements are to take place externally)

7. CONCLUSION

An initial noise impact assessment has been carried out for the new Sandvik Osprey Industrial Unit, at Land off J38 M4, Margam, SA13 2NR.

An initial design criterion for the main building fabric (wall/roof cladding and roller doors) has been specified to control factory noise break-out day and night.

Noise map models and preliminary noise impact assessments have then been carried out for the following:

- Daytime and night-time operations - including HGV movements – covering normal L_{Aeq} levels and L_{max} levels from Atomising pours
- Staff cars arriving/parking/leaving for the day and night shifts

Initial noise model results indicate daytime factory & HGV noise levels to meet criteria.

Car park noise assessment indicates an insignificant impact when compared with existing ambient noise levels and with screening in place car park noise is indicated to fall below the proposed noise criteria.

A good practice guide for control of noise at source is also included.

APPENDIX A – ACOUSTIC TERMINOLOGY

Human response to noise depends on a number of factors including loudness, frequency content and variations in level with time. Various frequency weightings and statistical indices have been developed in order to objectively quantify ‘annoyance’.

The following units have been used in this report:

dB(A)	The sound pressure level A-weighted to correspond with the frequency response of the human ear and therefore a persons’ subjective response to frequency content.
L_{eq}	The equivalent continuous sound level is a notional steady state level which over a quoted time period would have the same acoustic energy content as the actual fluctuating noise measured over that period.
L_{max}	The highest instantaneous sound level recorded during the measurement period.
L_{10}	The sound level which is exceeded for 10% of the measurement period. i.e. The level exceeded for 6 minutes of a 1 hour measurement – used as a measure of background noise.
L_{90}	The sound level which is exceeded for 90% of the measurement period. i.e. The level exceeded for 54 minutes of a 1 hour measurement – used as a measure of background noise.
$L_{Ar,Tr}$	The ‘rating’ level, as described in BS 4142:2014 – the specific noise plus any adjustment for the characteristic features of the noise.
SSR	Sound sensitive receiver
R_w	Weighted Sound Reduction Index. R_w is a single number (dB) referring to the ability of a wall or other building structure to provide sound insulation. The higher the number, the better the sound insulation. R_w refers to sound insulation achieved in an acoustic testing laboratory.

APPENDIX B – DIAGRAMS, GRAPHS AND TABLES

Table B.1 – Third-Octave Band Spectra – Sourec Plant Noise Survey

Position	Description	Distance from source (m)	Duration (mm:ss)	L _{Aeq} (dB)	L _{Amax} (dB)	L _{eq} at Third Octave Band Centre Frequencies, Hz (dB)																							
						50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
0	Atomising: POWs 4, 5 & 6 & 7 Idling	Room Average	01:18	77.7	79.8	73.0	67.8	67.8	73.7	74.3	73.3	73.4	74.2	74.6	71.9	70.3	70.2	69.3	67.6	66.4	65.4	64.2	62.9	60.6	58.3	56.2	54.8	53.1	50.5
1	POW6 Idling	1m	00:20	77.9	79.0	71.6	66.9	67.5	70.4	75.8	73.3	72.1	73.2	73.7	71.5	69.8	69.8	70.4	67.5	66.1	65.6	64.1	63.5	61.2	59.6	57.0	56.0	54.6	52.1
2			00:11	83.7	84.5	71.0	65.7	70.1	75.3	87.1	77.3	79.0	79.0	78.4	79.3	76.5	75.6	74.6	73.6	72.6	70.9	69.4	67.6	64.8	62.9	61.6	59.8	57.0	53.6
3			00:10	82.6	83.4	73.2	67.7	72.3	74.5	79.7	77.5	77.6	78.0	79.7	76.5	75.4	75.0	75.1	72.4	72.1	69.6	68.0	66.3	63.6	61.2	59.2	57.7	55.3	53.0
4			00:10	81.9	82.6	74.2	70.3	69.5	74.4	78.7	76.7	76.9	77.3	75.9	76.2	74.9	74.5	74.5	72.5	71.3	69.6	67.9	66.0	62.7	60.1	57.7	55.5	53.4	50.9
5			00:12	82.8	83.5	69.4	66.5	75.2	76.3	82.9	77.6	78.6	79.5	78.8	77.0	75.2	75.3	74.3	72.5	71.8	70.1	68.8	67.1	63.9	60.8	58.2	56.1	53.4	50.2
6	Atomising: POWs 4, 5 & 6 & 7 Idling	Room Average	00:10	83.4	84.1	69.8	67.3	70.3	71.2	80.8	75.9	78.1	76.8	77.8	77.8	76.3	77.0	75.3	73.9	71.9	71.1	70.1	68.3	64.8	61.7	59.1	57.4	54.8	51.2
7	First Floor		00:10	81.8	82.5	69.3	66.9	69.6	71.3	78.8	73.2	75.6	77.6	76.4	74.9	74.1	75.1	72.7	71.4	70.5	69.3	68.9	67.6	66.0	64.1	62.9	61.5	60.3	57.6
8			00:11	82.1	82.9	73.3	67.2	69.4	75.9	78.5	75.3	77.5	77.4	77.0	75.9	73.7	75.7	73.1	71.6	71.2	69.9	68.9	67.8	66.0	63.8	62.1	60.7	58.6	56.0
9			00:10	80.3	81.0	70.6	65.0	67.6	75.7	74.9	73.0	74.1	74.7	75.5	75.1	73.3	73.6	71.3	70.4	69.1	68.1	66.8	65.1	62.8	60.7	58.6	56.7	54.2	50.6
10			00:10	81.4	82.1	70.3	70.7	66.8	72.8	73.8	76.0	75.2	76.5	77.7	75.9	74.5	74.6	72.7	71.3	70.1	68.7	67.4	65.8	63.2	60.8	58.5	56.9	55.1	51.8
11			00:10	82.6	83.2	74.7	74.2	73.5	72.7	74.6	80.4	76.7	79.5	78.0	76.3	77.2	74.5	74.3	72.4	71.4	70.3	68.5	66.5	64.3	61.8	59.2	57.1	54.9	51.4
12	POW8 Idling @ First Floor	1m	00:10	81.6	82.5	73.4	68.6	70.5	72.4	79.5	78.0	78.8	76.7	75.8	75.3	74.2	75.1	72.2	71.1	70.0	69.2	69.0	66.6	64.7	63.2	61.3	60.1	58.3	55.5
13	POW8 Idling @ Ground Floor	1m	00:10	79.7	82.9	77.0	68.9	68.2	70.9	73.0	73.2	74.8	71.3	75.0	72.6	72.0	72.4	70.4	69.1	68.7	70.2	66.7	65.0	64.0	61.2	59.3	58.0	56.3	53.3
14	POW9 Atomising @ Ground Floor		00:35	100.2	101.9	78.8	73.3	73.5	79.5	75.7	75.7	74.3	73.6	74.8	75.8	76.5	82.4	88.3	84.9	83.8	86.3	87.5	88.9	89.5	91.4	93.5	90.2	85.5	80.1
15	POW8 Idling @ First Floor	1m	00:30	84.0	87.3	71.9	67.7	70.1	73.8	75.3	77.6	80.9	77.0	75.6	76.8	75.5	76.6	74.2	72.9	71.8	71.8	71.3	70.6	70.2	70.3	70.5	67.5	64.4	60.9
16	POW9 Idling @ Ground Floor, including alarm	5m	01:00	84.4	95.5	82.5	72.1	71.8	79.7	72.9	75.0	73.2	74.9	85.0	70.6	70.2	72.5	77.3	71.2	68.8	74.5	68.7	66.9	66.9	67.4	68.4	70.9	72.5	69.1
17	POW11 Idling @ First Floor	1m	00:10	81.9	82.6	71.4	69.8	72.7	80.9	76.1	76.4	73.6	73.4	73.9	71.9	72.9	73.5	74.9	71.6	71.2	71.1	69.4	69.4	69.0	62.8	61.0	61.7	60.0	55.2
18	POW11 Idling @ Ground Floor	1m	00:31	81.3	84.9	73.1	71.0	71.4	75.0	78.9	76.4	73.9	74.5	77.9	72.0	74.2	73.3	72.0	70.5	68.8	73.8	67.8	65.7	63.9	61.5	59.1	57.9	56.5	57.0
19	Furnace Prep Room	Room Average	00:30	67.2	68.6	68.4	68.4	65.0	70.1	66.2	64.8	63.3	61.7	62.1	59.2	59.7	59.8	59.5	57.5	56.1	54.9	52.4	49.9	49.9	46.1	46.2	44.3	40.4	35.1
20	Wall Louvres & Condensers	2m	00:30	74.0	79.5	68.2	65.8	66.7	70.8	73.9	72.5	68.4	67.8	68.7	64.8	64.3	66.9	65.0	64.2	63.9	63.1	60.7	59.8	58.3	53.8	51.0	50.0	48.4	44.5
21	Metal Banging Break-out from Atomising	2m	00:08	75.2	81.5	68.2	66.3	66.2	67.6	69.4	67.5	65.5	65.9	65.6	63.8	67.2	70.1	66.1	65.7	65.2	64.7	63.2	60.9	58.1	56.0	53.7	50.3	47.3	43.4
22	Lorry pass by	5m	00:10	74.7	77.2	69.6	71.2	71.0	75.2	73.0	74.9	67.9	73.4	68.9	66.4	67.9	64.8	64.5	64.8	64.7	64.4	61.8	58.5	56.1	53.0	50.3	48.4	46.7	44.4
23	Wall Louvres - Atomising Building	5m	00:10	73.2	74.3	70.7	71.9	74.7	74.9	71.2	74.5	67.0	70.7	69.8	65.7	66.7	63.2	63.1	63.3	62.5	61.8	59.3	56.7	54.5	52.4	49.8	48.3	45.1	41.7
24	Wall Louvre - Atomising Building	1m	00:05	85.4	86.4	78.3	83.1	84.1	80.6	79.6	82.3	76.5	80.1	84.8	74.3	75.6	76.6	75.9	76.7	75.5	73.9	71.8	69.4	67.4	64.5	61.4	60.4	57.2	52.7
25	Wall Louvre - Atomising Building	1m	00:05	85.5	86.1	79.6	83.7	85.7	86.0	82.5	80.5	77.1	81.3	80.8	74.4	75.9	75.0	76.8	78.0	76.6	74.1	72.9	70.3	67.9	65.6	62.0	60.7	57.1	52.3
26	POW Exhaust Ventilation Plant	1m	00:20	75.0	79.4	78.7	69.0	71.4	76.5	72.0	69.6	69.7	70.8	70.2	68.7	65.1	66.6	66.5	61.6	61.0	65.1	61.4	58.8	59.5	61.0	59.2	57.9	57.6	55.1
27	POW Exhaust Ventilation Plant	1m	00:10	80.0	81.9	84.9	74.5	79.5	77.2	73.7	76.4	74.5	75.1	78.4	75.2	71.3	70.8	74.4	66.4	64.7	65.9	63.2	62.5	62.8	63.4	61.5	61.1	58.6	56.1
28	POW Exhaust Ventilation Plant	1m	00:10	77.9	79.3	86.3	75.1	78.3	76.7	72.5	74.3	72.2	71.5	73.9	72.2	70.2	70.2	70.4	66.2	64.8	64.5	63.3	62.4	62.8	61.9	61.5	60.7	58.5	56.3
29	POW Exhaust Ventilation Plant	1m	00:10	78.0	79.1	85.5	78.0	77.3	77.3	71.5	72.3	74.3	72.8	71.1	73.4	71.2	69.7	68.9	66.3	66.4	64.9	64.7	63.7	62.8	61.7	60.5	59.5	57.7	54.6
30	POW Exhaust Ventilation Plant	1m	00:10	78.8	81.0	83.7	79.6	78.9	79.9	74.9	74.4	74.2	74.1	75.0	73.0	70.4	72.2	70.1	67.1	65.9	64.8	65.5	63.7	63.5	61.0	59.9	62.6	58.5	55.1
31	Cobalt Plant Dust Extract	1m	00:10	85.1	86.0	84.9	75.9	77.3	84.2	80.1	77.7	77.6	78.9	76.9	75.3	80.0	74.9	72.7	73.5	72.3	72.9	71.6	72.3	70.2	68.3	66.7	66.3	63.6	
32	Cobalt Building (Vacuum Off)	Room Average	00:52	84.2	93.3	77.9	71.7	71.0	73.3	68.9	68.6	69.9	71.1	78.6	72.5	71.5	81.3	74.6	72.0	71.9	74.6	70.8	69.3	68.2	68.1	65.8	65.2	63.8	60.5
33	Cobalt Building (Vacuum On)	Room Average	00:35	84.5	92.5	78.1	71.1	71.2	73.5	68.8	68.9	70.1	71.7	78.6	73.6	71.6	81.6	74.7	72.5	72.2	74.9	70.3	69.8	68.7	68.6	66.5	68.8	68.0	61.4
34	Blender/Sieve/Classifier Building Exhaust Ventilation Plant	1m	00:30	79.0	85.1	86.3	71.5	76.5	79.0	76.1	71.7	79.5	75.3	78.0	73.8	65.1	64.6	62.8	63.3	64.0	61.0	61.8	61.7	62.4	65.4	65.4	67.4	68.3	69.6
35	Classifiers & Sieves	Room Average	01:00	86.1	88.1	76.1	70.4	74.7	76.7	78.2	79.3	77.3	77.9	77.0	77.6	78.7	78.4	76.6	76.2	75.6	74.4	75.0	73.5	71.8	70.1	67.7	66.7	64.9	62.2
36	Blender Area	Room Average	01:00	78.7	89.2	70.1	64.8	71.1	73.2	73.2	71.1	71.7	71.2	69.3	70.8	71.4	70.7	68.0	66.6	68.3	66.5	66.1	66.9	65.0	63.7	63.5	64.3	63.4	59.8
37	Blender Packaging	Room Average	00:25	81.1	84.9	78.4	67.6	73.6	74.3	75.9	73.9	74.4	73.0	71.7	72.6	72.7	72.0	70.0	69.2	70.2	68.8	68.6	69.4	68.3	66.8	68.2	66.6	66.1	63.1
38	Cryogenics: 2no external fans	1m	00:37	92.7	94.2	79.1	73.3	71.9	76.9	75.4	84.9	85.2	87.4	89.9	87.4	87.9	85.8	85.3	83.1	80.									

APPENDIX C – DRAWINGS

The following drawings were used in our assessment;

Table C.1 – Sandvik Osprey Ltd Drawings

Drawing Title	Drawing Number	Rev	Date
Margam Site Layout	075 272 N15 00	A	17/5/19

Table C.2 – James & Nicholas Drawings

Drawing Title	Drawing Number	Rev	Date
Overall Site Masterplan	2062 C02	D	25/01/22
Building Elevations	2062 ESK07	-	-