ICT Paper Mill, Northern Gateway

Noise Impact Assessment - Environmental Permitting Report

Industrie Cartarie Tronchetti (ICT) UK Limited

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Principal author: Simon Everett

Signed by: Simon Everett

21/03/2023

X

Checked by: Michael Pimlott

Signed by: Michael Pimlott

22/03/2023

X

Verified by: Colin O'Connor

Signed by: O'Connor, Colin

Synopsis

This noise impact assessment supports the application for an Environmental Permit to operate the Deeside Paper Mill.

Whilst planning permission for all three phases was consented March 2022, due to Phase 3 potentially being developed at a much later date only Phases 1 and 2 are being permitted at this time. This assessment therefore considered the impacts from operation of Phase 1 and also the cumulative effects from operation of Phases 1 and 2.

The noise assessment herein has been carried out in accordance with the guidance contained in BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' (BS 4142).

To assess the existing noise environment in relation to nearest noise sensitive receptors, an unattended noise survey was carried out between 3 - 8 November 2022.

The results of this survey have been analysed and the following representative background sound levels have been proposed to form the basis the BS 4142 assessment for all receptors.

- Daytime 47 dB $L_{A90,T}$;
- Night-time 40 dB $L_{A90,T}$.

Operational noise levels have been based upon data provided to Cundall by ICT. The data provided is representative of operational noise levels at an existing ICT site. The propagation of these noise sources to the nearest noise sensitive receptors (NSRs) have been calculated using a 3D model of the site created using SoundPLAN 8.2 acoustic modelling software. The primarily calculation methodologies employed by the software for this assessment are:

- BS EN ISO 12354-4:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 4: Transmission of indoor sound to the outside
- BS EN ISO 9613-2:1996, Acoustics – Attenuation of Sound during Propagation Outdoors– Part 2: General Method of Calculation

Mitigation measures to limit the noise impact have been incorporated into the design of the project, and barriers near to worst case effected receptors, and are factored into the noise modelling process as discussed further herein.

The table below summarises the assessment results.

Receptor	Period	Rating Level / dB $L_{Ar,15min}$	Background Sound Level / dB $L_{A90,15min}$	Difference
C	Day	38	47	-9
	Night	38	40	-2
F	Day	44	47	-3
	Night	44	40	+4
G	Day	42	47	-5
	Night	42	40	+2

It is considered that controlling noise levels to not exceed the BS 4142 defined 'adverse impact' criteria of + 5 dB for future residential properties (i.e. those as part of the outline permission) and controlling noise levels to be below background for existing residential receptors is a suitable approach, with the relevant context described further herein.

The majority of elements of the BS 4142 assessment are considered to have a low degree of uncertainty. Where the greatest source of uncertainties have been identified in the modelling process, these are biased towards worst-case assumptions, which is considered a robust approach in reducing uncertainty. It is therefore considered that the uncertainties would not have a significant impact on the conclusions of the BS 4142 assessment.

Contents

1.0

Introduction

1.0 Introduction

Cundall has been commissioned by Industrie Cartarie Tronchetti (ICT) to undertake a noise impact assessment in support of the construction of a new paper manufacturing facility near Garden City, Deeside.

This assessment supports the application for an Environmental Permit to operate the Deeside Paper Mill. The paper mill is to be developed over three phases with following timescales envisaged for each phase:

- Phase 1 of the Paper Mill Facility: 2022 (Q3) - 2024 (Q1)
- Phase 2 of the Paper Mill Facility: 2024 (Q4) - 2026 (Q2)
- Phase 3 of the Paper Mill Facility: 2034 (Q1) - 2035 (Q3)

Phase 1 will comprise pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, converting area, raw materials storage, high bale warehouse, dispatch, water treatment plant, chemical storage, CHP plant and two boilers.

Phase 2 will comprise pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, and CHP plant.

Phase 3 will comprise pulp storage, bale handling, paper manufacture hall, jumbo rolls storage, converting area, high bale warehouse and CHP plant and two boilers.

Whilst planning permission for all three phases was consented March 2022, due to Phase 3 potentially being developed at a much later date only Phases 1 and 2 are being permitted at this time. This assessment therefore considered the impacts from operation of Phase 1 and also the cumulative effects from operation of Phases 1 and 2.

Operational noise associated with the proposed development will primarily consist of:

- Internal noise breakout from paper mill machines
- Exhaust noise from chimneys and flues
- HGV movements associated with the site

It is understood that internal noise breakout from paper mill machines and exhaust noise from chimneys and flues may be at full operational capacity for any time in a given 24 hour period. HGV movements will vary over a 24 hour period, worst case assumptions of movements as made by the transport consultant on the project have been adopted for the purposes of this assessment.

In order to assess the prevailing levels of environmental noise affecting nearby noise-sensitive receptors to the site, an environmental noise survey was undertaken by Cundall in November 2022.

The noise assessment herein has been carried out in accordance with the guidance contained in BS 4142:2014+A1:2019 ‘Methods for rating and assessing industrial and commercial sound’.

Operational noise levels have been based upon data provided to Cundall by ICT. The propagation of these noise sources to the nearest noise sensitive receptors (NSRs) have been calculated using a 3D model of the site created using SoundPLAN 8.2 acoustic modelling software. The primarily calculation mythologies employed by the software for this assessment are:

- BS EN ISO 12354-4:2017, Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 4: Transmission of indoor sound to the outside
- BS EN ISO 9613-2:1996, Acoustics – Attenuation of Sound during Propagation Outdoors– Part 2: General Method of Calculation

2.0

Assessment location

2.0 Assessment location

2.1 Site location

The Site is located in North Wales, within the local authority area of Flintshire. The Site is located on the western edge of Garden City, a village within the Sealand area of Flintshire.

The Application Site Boundary relates to an area of land of approximately 21.82 hectares (53.92 acres) in extent and forms part of the former RAF Sealand 'South Camp' site, now referred to as the Airfields, which forms part of the Northern Gateway Strategic Mixed Use Development site allocated under Policy HSG2A in the Flintshire UDP (2011).

Outline planning permission (ref: 049320) was granted for an employment led mixed use development in January 2013 and subsequently varied with the last Section 73 application approved in April 2021 (ref: 061125). The Site spans across Plot C as identified in The Airfields Design Statement (July 2013) submitted to discharge condition 6 of the outline planning permission (ref: 049320).

The Application Site occupies the north-western part of the Airfields site and currently comprises managed grassland.

The site is bound by a cycling and walking route known as the Chester Millennium Greenway to the north and western perimeter of the site, and the eastern and southern boundaries of the site will be bound by the Welsh Government's proposed Commercial Spine Road Phases 2 and 3. A red line boundary of the site is indicated below in Figure 2-1.

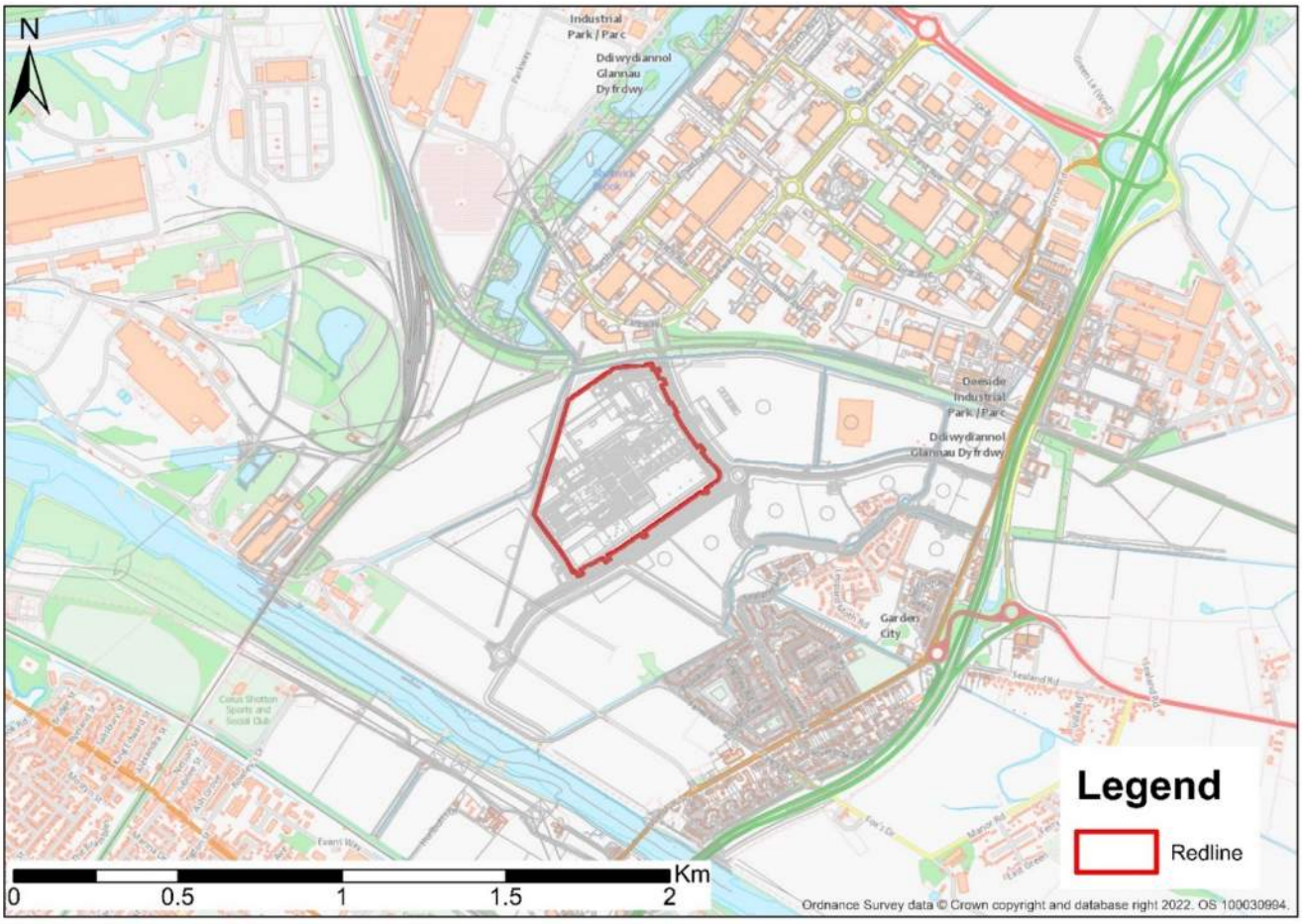


Figure 2-1: Red line boundary

2.2 Noise survey location

Figure 2-2 shows the location of unattended measurements that were carried out between 3 - 8 November 2022. Measurements were made at location P1 with the microphone at a height of approximately 1.5 m above ground level, in free-field conditions (i.e. greater than 3.5 m from a reflective surface other than the ground).

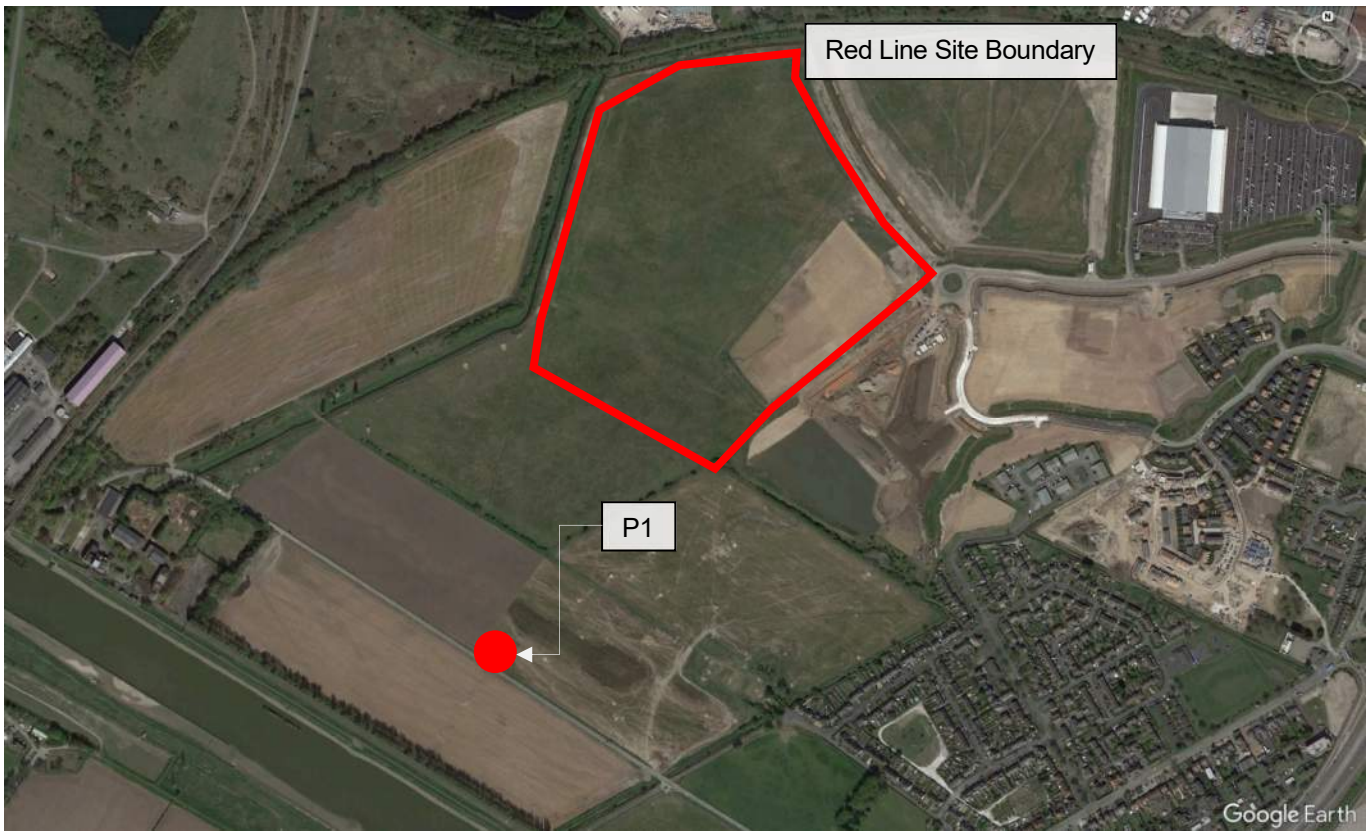


Figure 2-2: Approximate measurement location

The noise measurement position for the long-term survey is located centrally in relation to the noise sensitive receptors as detailed in Section 2.4. It is considered to not be at a closer proximity to any noise generating source that may elevate the measured background levels to higher than what any of the sensitive receptors would receive. Conversely, it is further from industrial sites and main road sources and as such representative levels taken from this position are likely to be lower than those experienced at the assessed receptors. It is therefore considered a suitably onerous position to define representative background sound levels at nearby noise-sensitive receptors.

2.3 Noise source locations

The following sub sections detail the location of the primary noise sources on site.

2.3.1 Internal noise breakout from paper mill machines

The primary source of noise that is expected to dominate all noise breakout is from the large processing machines located in the PM Halls.

The locations of the halls and subsequent façade noise sources in relation to the overall site plan has been based upon the proposed site layout plan and building elevations as submitted for planning by AEW Architects (Ref: 12500-AEW-SI-XX-DR-A-0508 Rev P9 and 12500-AEW-B1-XX-DR-A-0534 Rev P5). Extracts are provided below with the full drawings provided in Appendix A and Appendix B.

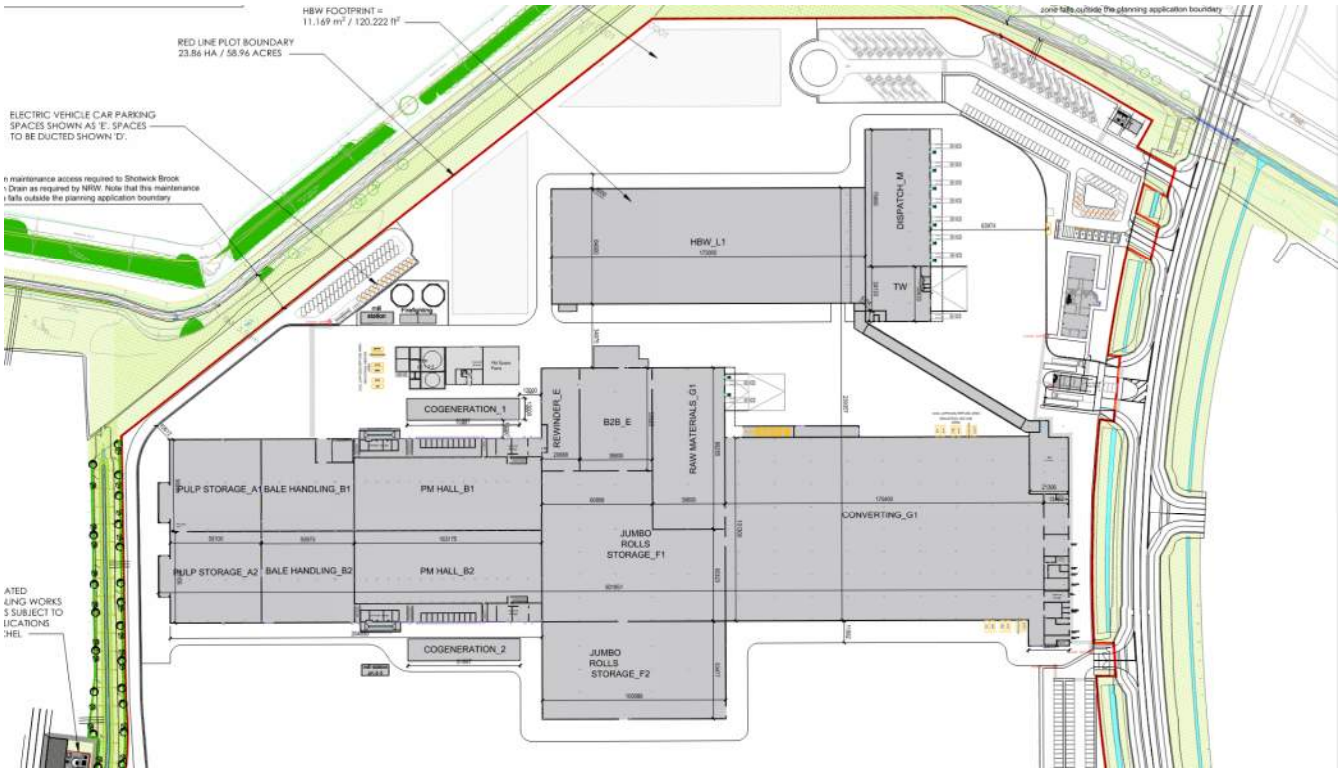


Figure 2-3: Phase 1 and 2 site layout plan

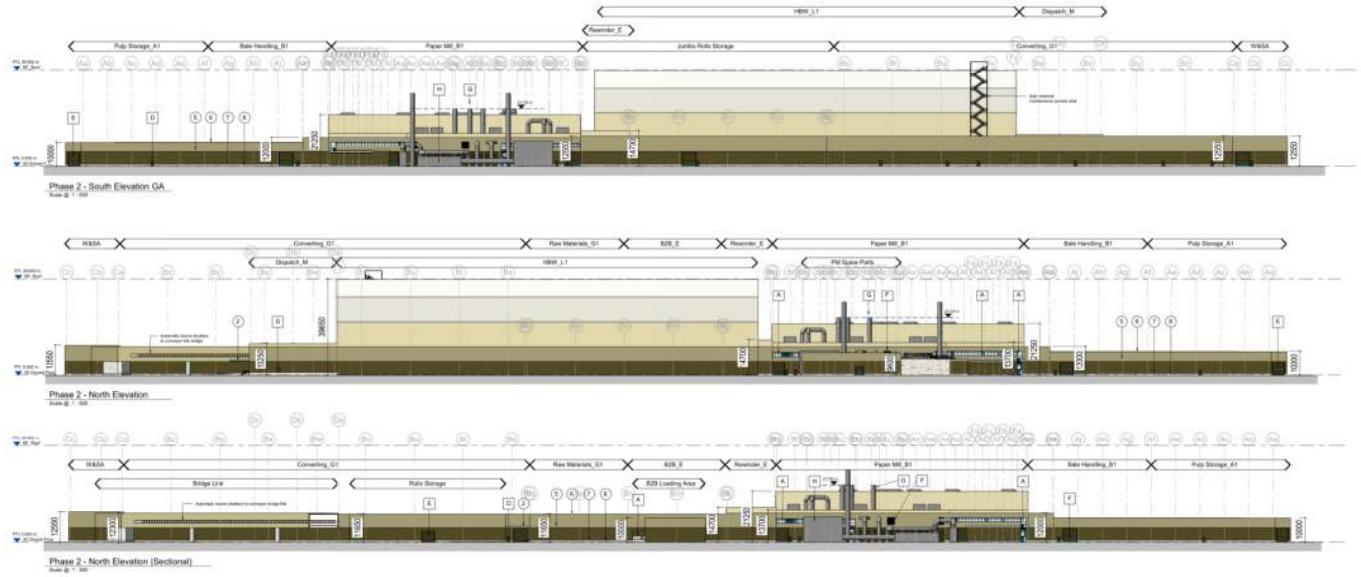


Figure 2-4: Site elevations

The layout of internal noise sources used in the breakout calculation is detailed later in this report.

2.3.2 Exhaust noise from chimneys and flues

The location of all noise-generating chimneys and flues for the first two phases of the site has been based on the drawing 'ICTUK-EMISS-01-29062021' as authored by ICT. Further information on heights has been provided alongside noise emission data also provided by ICT as detailed later in this report.

An extract from the SoundPLAN noise model where point noise sources are layered on top of this drawing is provided below, with the full drawing provides in Appendix C.

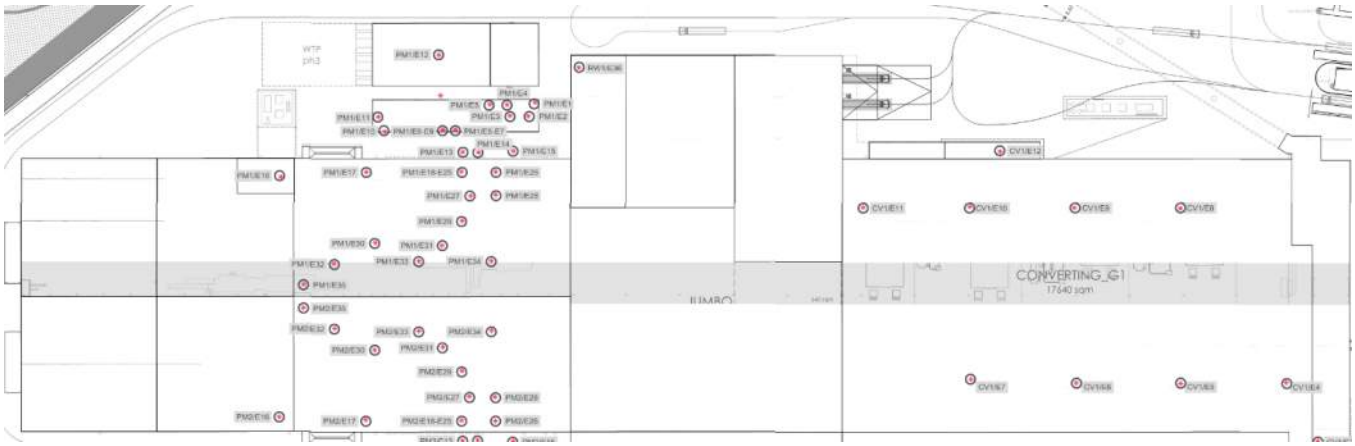


Figure 2-5: Extract from SoundPLAN model showing point source stack locations

2.3.3 HGV movements associated with the site

HGV movements within the site have been modelled based on the haul routes identified in Figure 2-6. The full drawing is provided in Appendix D.

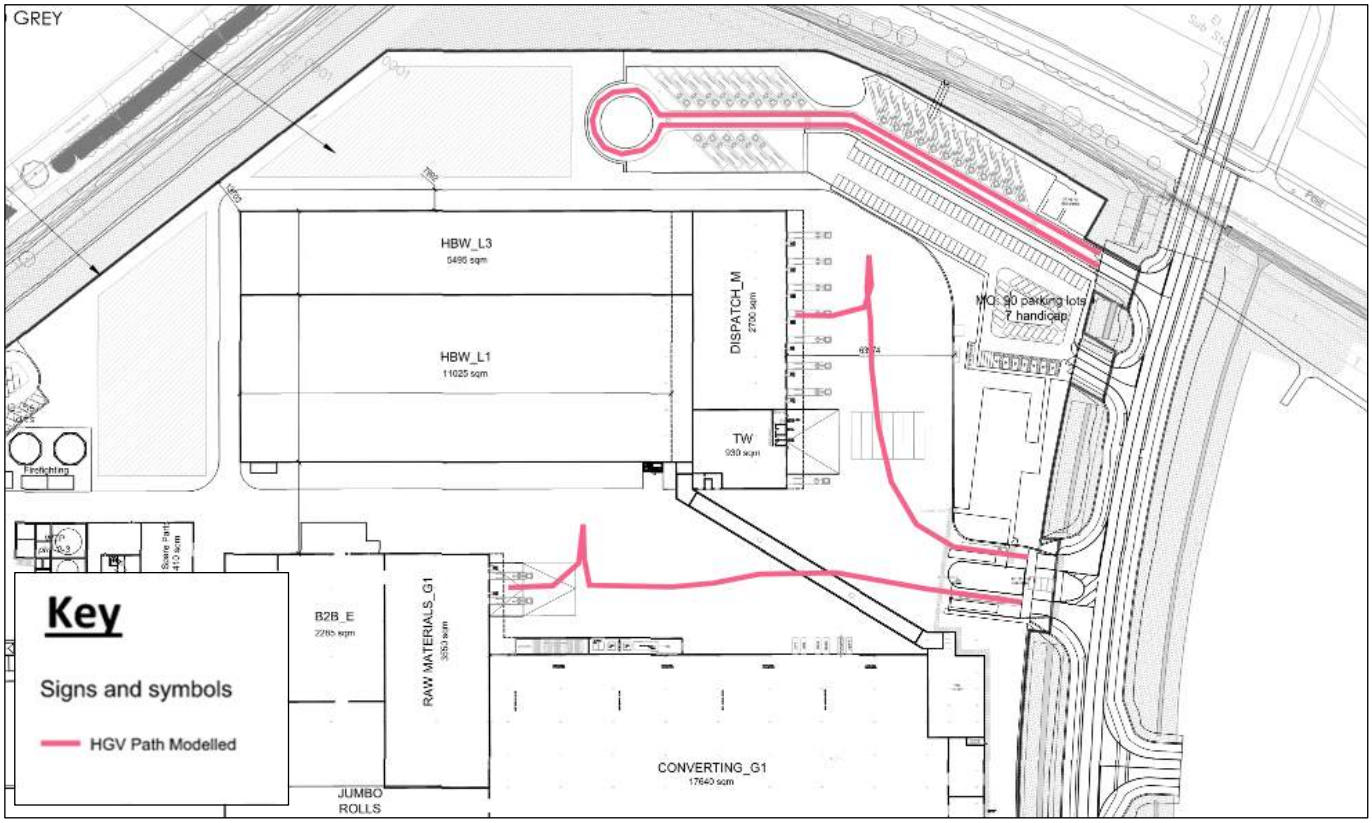


Figure 2-6: HGV modelled pathway

Further information on HGV movements has been provided by ICT as detailed later in this report.

2.4 Noise sensitive receptor locations

Noise-sensitive sensitive receptors in proximity to the site which have been taken into consideration in this assessment are detailed in Table 2-1.

Receptors	Existing / Proposed
A - Residential, Garden City	Existing
B - Future residential	Proposed
C - Future residential	Proposed

Table 2-1: Receptors

The approximate locations of noise-sensitive receptors highlighted in Table 2-1 are presented in Figure 2-7 and Appendix E. Further detail on precise receptor locations used in the modelling process is provided in Section 5.2.

Figure 2-7: Noise sensitive receptors

3.0

Equipment and meteorology

3.0 Equipment and meteorology

3.1 Noise survey equipment

Table 3-1: summarises the equipment used. The instrumentation used during the surveys conforms to BS EN 61672-1:2013 Class 1 accuracy. The sound level meter was fitted with a windshield and was field-calibrated before and after use in accordance with the manufacturer's instructions; no significant drift in calibration was observed (less than ± 0.5 dB).

Copies of external calibration certificates are provided in Appendix F.

Item	Serial number	Last calibration
Casella CEL 663C sound level meter	1211405	22/07/2021
Casella pre-amplifier 495	001211	22/07/2021
Casella microphone 251	02626	22/07/2021
Casella calibrator 120/1	4921893	05/07/2022

Table 3-1: Survey equipment

3.2 Meteorology

All surveys were unattended, and weather conditions were noted. The following observations were made using data taken on setup and collection of the survey (as specified) and via weather conditions monitored using local weather reports throughout the survey duration.

- Wind speeds: ranged from 0 to 0.4 m/s (measured on site with a GM 816 anemometer);
- Temperature: during the daytime measurements the temperature was between 9 and 16 °C;
- Cloud cover: moderate cloud cover was noted on site; and
- Precipitation: no precipitation was recorded.

4.0

Methodology

Methodology

4.1 British Standard 4142:2014+A1:2019

BS 4142 provides a method for rating and assessing sound of an industrial and/or commercial nature. This includes sound from industrial and manufacturing processes, fixed services plant, sound generated by the loading and unloading of goods and sound from mobile plant / vehicles associated with industrial / commercial premises (e.g. fork-lift trucks).

A key aspect of the BS 4142 assessment method is a comparison between the background noise level in the vicinity of receptor locations and the rating level of the noise source under consideration. The relevant parameters in this instance are as follows:

- background sound level – $L_{A90,T}$ – defined in the Standard as the 'A' weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels;
- specific sound level – $L_{Aeq,Tr}$ – the equivalent continuous 'A' weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr; and
- rating level – $L_{Ar,Tr}$ – the specific sound level plus any adjustment made for the characteristic features of the noise.

BS 4142 recommends that the specified interval over which the specific sound level is determined as 1-hour during the day from 07:00 to 23:00 hours and a shorter period of 15-minutes at night from 23:00 to 07:00 hours.

The standard recognises that certain acoustic features of a sound source can increase the impact over that expected based purely on the sound level. The standard identifies the following features to be considered:

- Tonality - a penalty of 2 dB is applied for a tone which is just perceptible at the receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible;
- Impulsivity - a penalty of 3 dB is applied for impulsivity which is just perceptible at the receptor, 6 dB where it is clearly perceptible and 9 dB where it is highly perceptible. An impulse is defined as the sudden onset of a sound;
- Intermittency - a penalty of 3 dB can be applied if the intermittency of the specific sound is readily identifiable against the residual acoustic environment at the receptor i.e. it has identifiable on/off conditions;
- Other sound characteristics - a penalty of 3 dB can be applied where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, thought otherwise are readily distinctive against the residual acoustic environment. Note that this correction should only be applied in the absence of the other characteristics and is not to be added to the corrections for tonality, impulsivity, or intermittency.

Once any adjustments have been made, the background level and the rating levels are compared. BS4142 advises the following:

- *"Typically, the greater this difference, the greater the magnitude of the impact.*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

It should be noted that the updated version of BS 4142 draws a clear distinction between the detailed and flexible assessment methods contained within, and the more limited versions contained in the previous (1997) edition.

The initial estimate of the impact needs to take in account the context and pertinent considerations regarding the nature of the acoustic environment, the specific sound source, and the affected receptors. BS 4142 advises that where rating

levels and background levels are low, that *"absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."*

5.0

Noise monitoring data and predictions

5.0 Noise monitoring data and predictions

5.1 Survey results

A summary of the daytime and night-time ambient sound levels recorded are detailed in Table 5-1:. A time history chart of the measured levels is presented in Figure 5-1.

Measurements were taken of the following sound level indicators:

- $L_{Aeq,T}$ (the continuous equivalent A-weighted sound level over a given time period)
- $L_{A90,T}$ (the A-weighted background sound level over a given time period), presented below as the range across each period.

Date	Daytime (T = 07:00-23:00)		Night-time (T = 23:00-07:00)	
	Residual sound level $L_{Aeq,T}$ (dB)	Background sound level range $L_{A90,15min}$ (dB)	Residual sound level $L_{Aeq,T}$ (dB)	Background sound level range $L_{A90,15min}$ (dB)
03/11/2022 (Measurement start time 13:45)	50	42 – 51	45	42 – 46
04/11/2022	55	41 – 49	47	38 – 46
05/11/2022	59	40 – 50	47	38 – 46
06/11/2022	50	42 – 50	44	36 – 48
07/11/2022	50	41 – 53	47	36 – 47
08/11/2022 (Measurement end time 11:45)	49	44 – 49	-	-

Table 5-1: Summary of measured noise levels

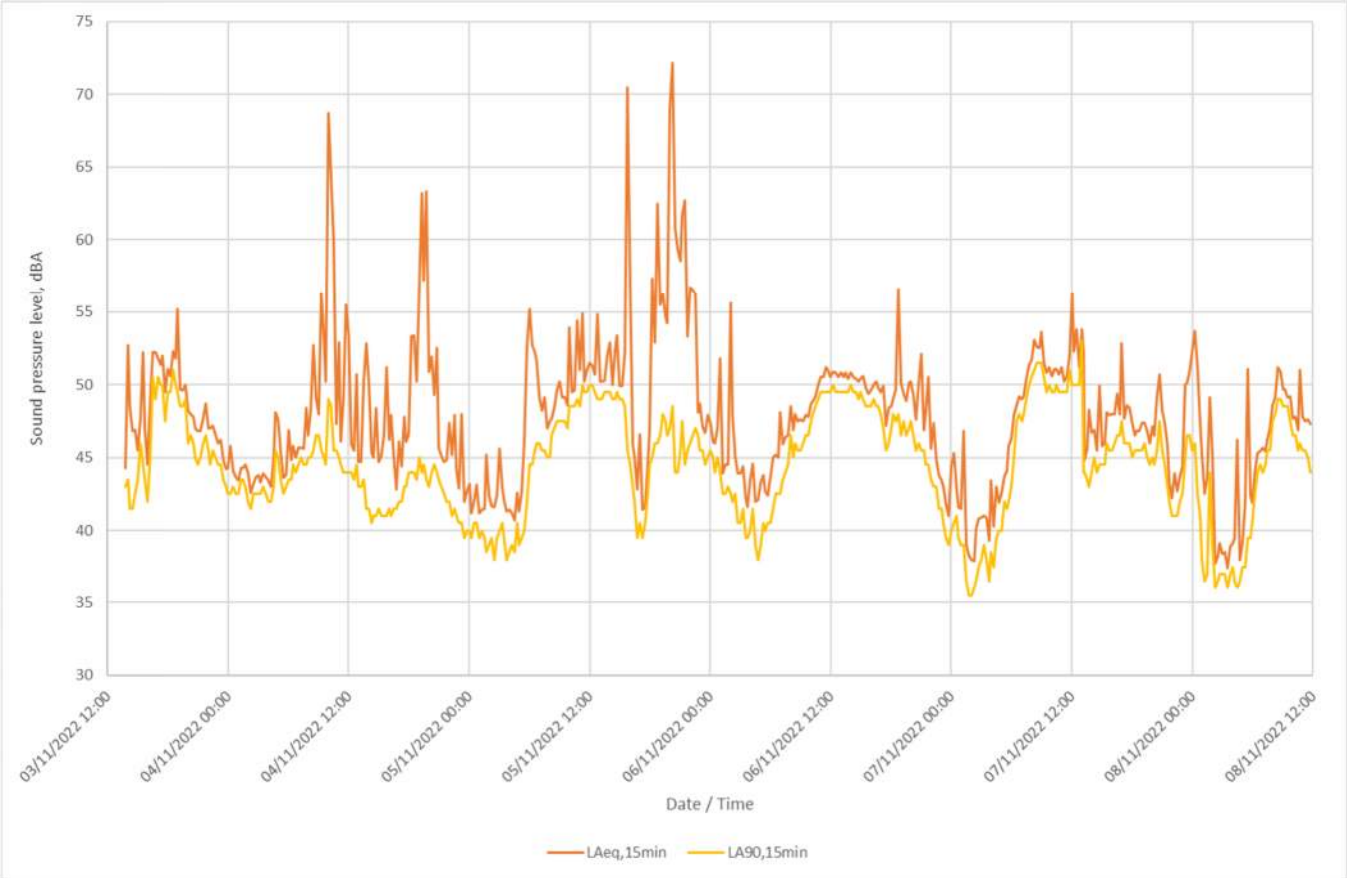


Figure 5-1: Time history chart of measured noise levels

5.1.1 Representative background levels

BS 4142 requires that the predicted level of impact (i.e. the rating level) of a noise source be compared against the existing 'representative' background sound level at the sensitive receptor.

In accordance with the example methodology set out in Note 4, Section 8.1.4 of BS 4142, statistical analysis has been undertaken to determine the most commonly occurring $L_{AF90,15min}$ value during daytime (07:00 – 23:00) and night-time (23:00 – 07:00) hours, with the histogram representing occurrences provided in Figure 5-2 and the levels considered most representative highlighted in red.

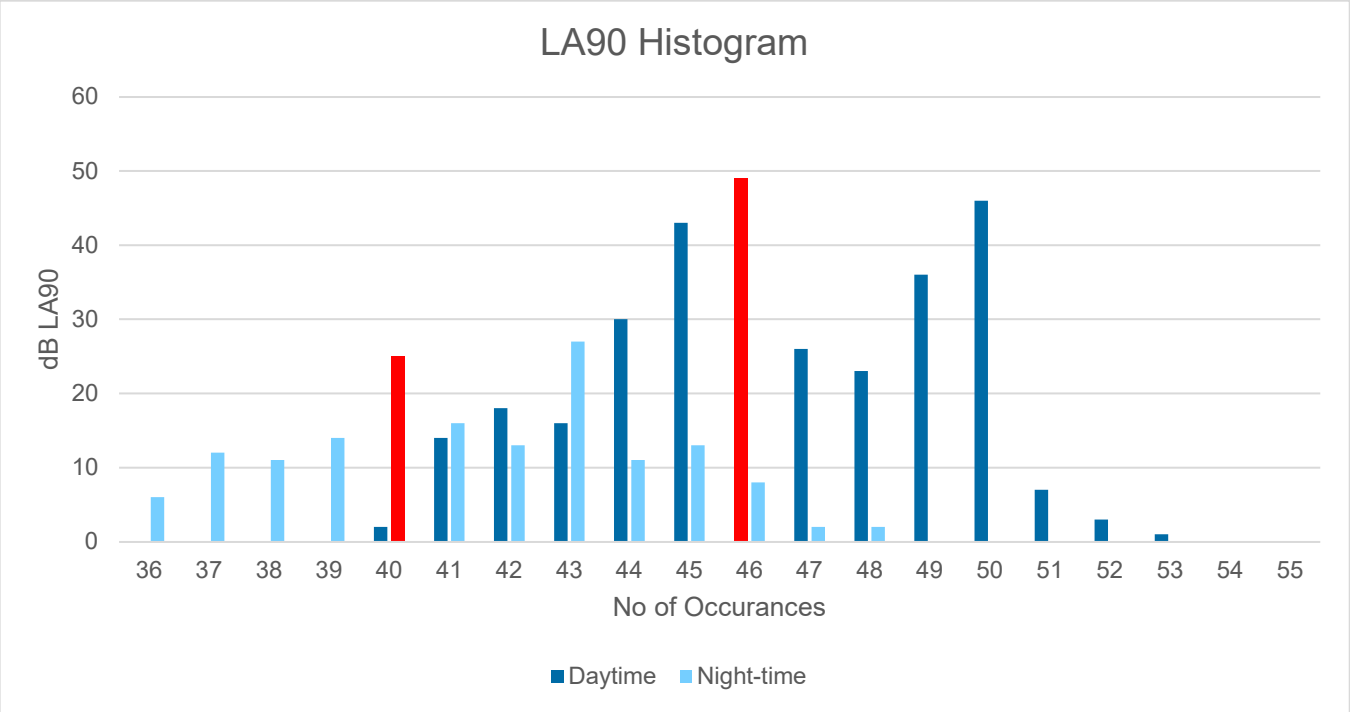


Figure 5-2: Background level $L_{A90,T}$ histogram

It can be seen from the above that the most commonly occurring background sound levels are:

- Daytime 46 dB $L_{A90,T}$;
- Night-time 40 dB $L_{A90,T}$.

These are considered representative of the future and existing residential properties around the development site, as discussed in Section 2.2

5.2 Noise modelling parameters

In order to accurately assess the noise impact at the nearest residential receptors, a 3D noise model of the site has been created using SoundPLAN 8.2 software. The following sub sections detail the calculation setup for each of the noise sources within the model.

For all noise sources modelled, broadband data only has been available (in the form of single figures provided by ICT with regards to the paper mill activities and exhaust, and single figures provided in BS 5228:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise' with regards to HGV movements).

The data provided has been sourced entirely from an existing operational site in Europe which utilises the same specialist equipment as will be installed at the proposed Development. The equipment used on the existing site is specialist bespoke machinery and as such no manufacturer's data is available and the assessment must rely sole on the figures provided to Cundall by ICT.

In line with the requirements of BS EN ISO 9631-2, propagation of these noise sources has been based on the broadband values being contained within the 500 Hz frequency band.

5.2.1 Propagation parameters

Locations of noise sources and receivers are detailed in Section 2.0 of this report. Noise propagation within SoundPLAN 8.2 due to distance attenuation is calculated in accordance with BS EN ISO 9631-2.

The ground heights within the noise model for the site and surrounding areas containing the noise-sensitive receptors have been based upon the following information provided to Cundall.

- Shepherd Gilmour's Enabling Works Ground Model (drawing no. C1405/508 dated 23/07/2021) has been included in the model to represent the topography of the site.
- LIDAR height (Composite Digital Terrain Model) data at a resolution of 1 m topographical contours from the Environment Agency was used to model the topography of the areas surrounding the site.

In accordance with guidance provided in BS EN ISO 9631-2, areas defined as 'hard' ground (e.g. road surfaces) have been assigned a ground absorption of 0, and areas defined as 'soft' surfaces (e.g. grass) have been assigned a ground absorption of 1.

The following mitigation measures to be adopted at proposed residential dwellings on the opposite side of the Welsh Government constructed commercial spine road have also been included within the noise modelling, with mitigating effects also being calculated in line with guidance provided in BS EN ISO 9631-2 on barrier attenuation.

- Receptor B – 2.6m tall earth bund (1:2.5 slope on either side) with 1.4m acoustic barrier positioned on top (total effective height 4m) along the full boundary extent with the Welsh Government road (Residential Plots H5 and H5 of CHEL Site).
- Receptor C - Minimum 2.5m tall acoustic barrier along the full boundary extent with the Welsh Government road.

The above boundary mitigation measures are committed as part of the planning requirements for the residential schemes in question being bought forward and as such these will be implemented prior to occupation of the proposed residential properties.

The extent of proposed residential site boundary at Receptor C as specified on the outline planning application have also been assigned a volume attenuation area. Values assigned are in line with attenuation provided by 'Housing' as defined in BS EN ISO 9613-2.

5.2.2 Internal noise breakout from paper mill machines

The paper mill processing buildings (PM Halls) have been modelled as 'industrial buildings' in SoundPLAN which have area sources for external walls and roofs.

Sound pressure data based on in situ point receiver measurements around an existing paper milling machine that is understood to be representative of the one to be installed within the PM halls has been provided to Cundall by ICT. The highest external noise measurement around the machine provided was found to be 95.9 dB L_{pA}. An extract of the measurement positions drawing is given in Figure 5-3; the highest noise level at an external measurement position was located at position 85 of the below layout.

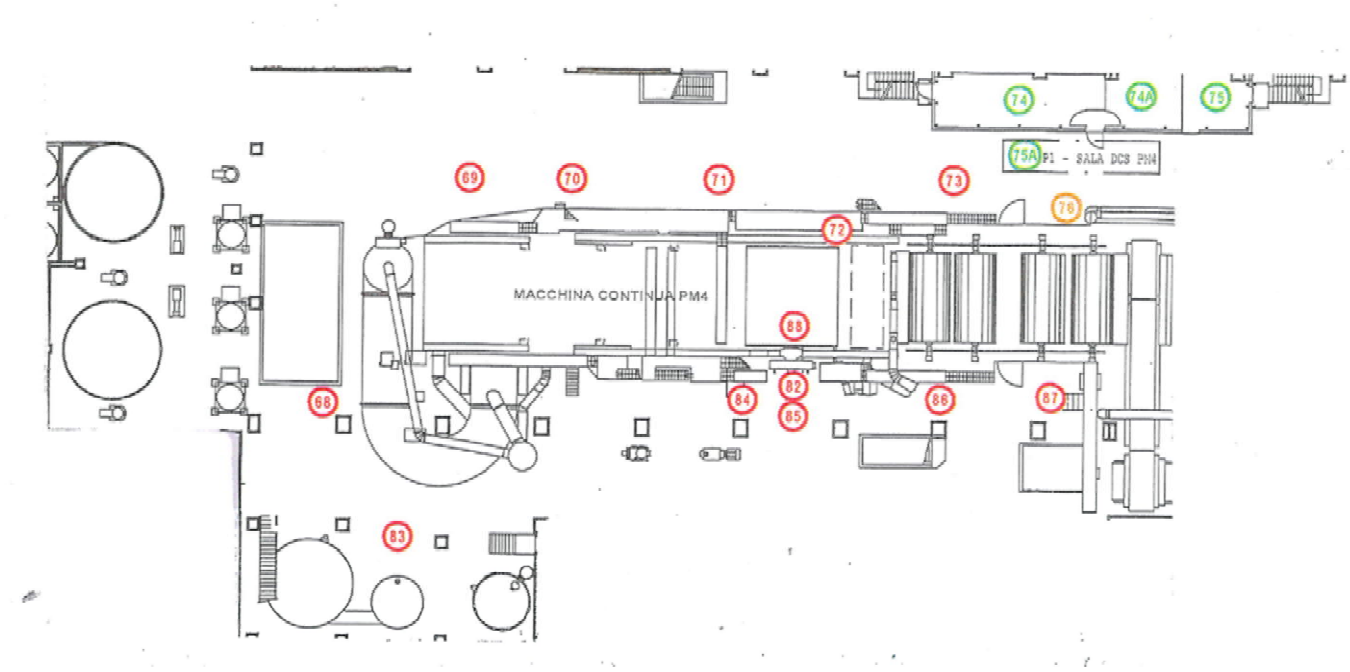


Figure 5-3: Paper mill noise measurement positions

ICT have also provided a drawing of the layout of these machines within the PM halls entitled 'ICT_SITE LAYOUT PLAN_PH1+2+3', an extract of this is provided below.

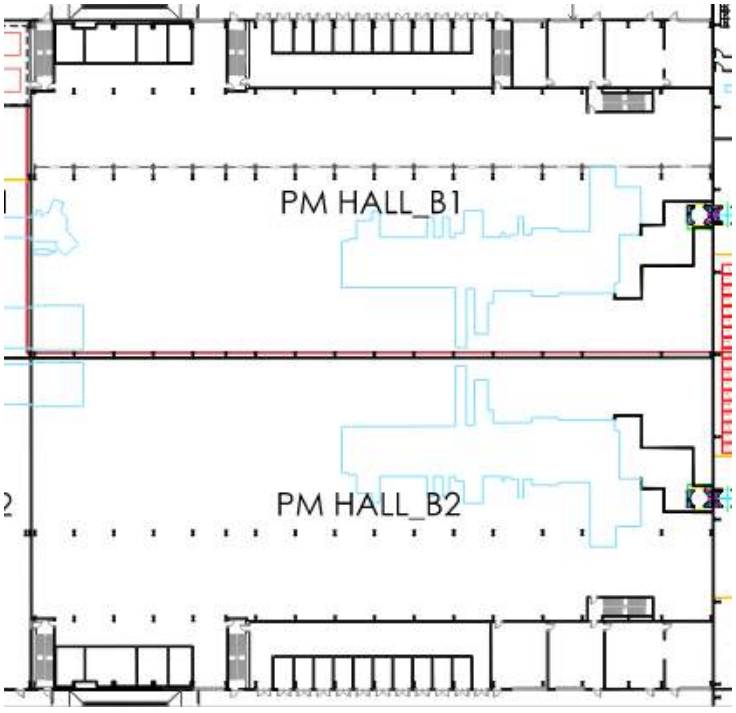


Figure 5-4: PM Hall machine layouts

The industrial buildings model in SoundPLAN has incorporated the above information by first being utilised to calibrate an internal 3D area source of the machine, and then calculating the breakout noise in line with guidance provided in BS EN ISO 12354-4.

Parameters for calibrating the internal noise source were as follows.

- Machine extent drawn over approximate outlines as provided by ICT in Figure 5-4 and assigned a height of 6 m

- Point receiver places at height of 1.8 m above ground and 1m away from centre of machine, deemed to be representative of position 85 provided by ICT as shown in Figure 5-3
- Machine area source and internal façade and ground surfaces assigned worst case low absorption and scattering coefficients (< 0.1)

After this internal point source calibration the model was used to calculate the noise breakout in line with the calculation procedure described in BS EN ISO 12354-4. The parameters required for this standard calculation that were defined in the model were as follows.

- Wall and roof constructions providing broadband sound reduction of 24 dB R_w. This is based on using a Kingspan AW/60 system with no lining. Octave band Sound Reduction Index (SRI) data is provided in Table 5-2.

Product description	Octave band centre frequency (Hz)						
	63	125	250	500	1k	2k	4k
Kingspan AW/60 + no lining	15	16	19	23	26	22	39

Table 5-2: Cladding octave band SRI

- Diffusivity term C_d defined as - 3 dB in line with Annex B of BS EN ISO 12354-4 'Industrial building, few dominating directional sources, in front of reflecting surface'
- Directivity index D_c as defined in Annex D of BS EN ISO 12354-4 assigned as 0 for a large plane radiator (this is also as per example calculation provided in Annex G of the standard)

Where there are proposed internal barriers between the PM hall and the outer façade, such as admin and storage spaces, it has been onerously assumed that these do not provide further attenuation.

5.2.3 Exhaust noise from chimneys and flues

External chimney / exhaust stack noise sources modelled based on the information provided by ICT as detailed in Section 2.3.2 of this report.

All stack / chimney sources are designed to discharge vertically and the resultant benefits of acoustic directivity losses at nearby noise-sensitive receptors has been considered within the 3D noise modelling process. Directivity data for an 'opening' available in SondPLAN's data library and originating from The Austrian Working Group for Noise Abatement's Guideline 'ÖAL-RIchtlinie Nr.28 2021/10/01' has been used in the modelling process.

Based on data provided to Cundall by ICT, Table 5-3 details the stack / chimney noise emissions data as included within the SoundPLAN noise modelling exercise. Where some form of acoustic mitigation is proposed to be incorporated and embedded into the design of the Stack / Chimney emissions source to achieve the stated dB values (e.g. via silencers or noise hoods), this has also been identified.

ID	OAD height, m	Sound Pressure Level at 1 m, dB L_{pA}	Sound Power Level, dB L_{WA}	Noise reduction incorporated into design
Phase 1				
CV1/E1	+11.00		80	-
CV1/E2	+11.00		80	-
CV1/E3	+10.00	75		-
CV1/E12	+13.00		86	-
CV1/E4	+22.00		86	-
CV1/E5	+22.00		86	-
CV1/E6	+22.00		86	-
CV1/E7	+22.00		86	-

ID	OAD height, m	Sound Pressure Level at 1 m, dB L_{pA}	Sound Power Level, dB L_{WA}	Noise reduction incorporated into design
CV1/E8	+22.00		86	-
CV1/E9	+22.00		86	-
CV1/E10	+22.00		86	-
CV1/E11	+22.00		86	-
PM1/E1	+6.49	80		Noise hood
PM1/E2	+6.50	80		Noise hood
PM1/E3	+28.50	75		Silencer
PM1/E4	+6.49	80		-
PM1/E5	+6.48	80		-
PM1/E6	+6.49	80		-
PM1/E7	+6.50	80		-
PM1/E8	+6.50	80		-
PM1/E9	+6.50	80		-
PM1/E10	+28.50	75		Silencer
PM1/E11	+6.49	80		-
PM1/E12	+6.50	80		-
PM1/E13	+28.50	75		Silencer
PM1/E14	+28.50	75		Silencer
PM1/E15	+28.50	75		Silencer
PM1/E16	+20.00		91	-
PM1/E17	+17.00	75		Silencer
PM1/E18	+10.00	80		-
PM1/E19	+10.00	80		-
PM1/E20	+10.00	80		-
PM1/E21	+10.00	80		-
PM1/E22	+10.00	80		-
PM1/E23	+10.00	80		-
PM1/E24	+10.00	80		-
PM1/E25	+10.00	80		-
PM1/E26	+10.00	75		Silencer
PM1/E27	+23.00	75		Silencer
PM1/E28	+23.00	75		Silencer
PM1/E29	+27.50	75		Silencer
PM1/E30	+27.50	75		Silencer
PM1/E31	+27.50	75		Silencer

ID	OAD height, m	Sound Pressure Level at 1 m, dB L_{pA}	Sound Power Level, dB L_{WA}	Noise reduction incorporated into design
PM1/E32	+27.50	75		Silencer
PM1/E33	+27.50	75		Silencer
PM1/E34	+27.50	75		Silencer
PM1/E35	+27.50	75		Silencer
PM1/E36	+27.50	75		Silencer
Phase 2				
PM2/E1	+6.49	73		Noise hood
PM2/E2	+6.50	73		Noise hood
PM2/E3	+28.50	75		Silencer
PM2/E4	+6.49	73		Noise hood / Silencer
PM2/E5	+6.48	73		Noise hood / Silencer
PM2/E6	+6.49	73		Noise hood / Silencer
PM2/E7	+6.50	73		Noise hood / Silencer
PM2/E8	+6.50	73		Noise hood / Silencer
PM2/E9	+6.50	73		Noise hood / Silencer
PM2/E10	+28.50	75		Silencer
PM2/E11	+6.49	73		Noise hood / Silencer
PM2/E12	+6.50	80		-
PM2/E13	+28.50	75		Silencer
PM2/E14	+28.50	75		Silencer
PM2/E15	+28.50	75		Silencer
PM2/E16	+20.00		83	Noise hood / Silencer
PM2/E17	+17.00	75		Silencer
PM2/E18	+10.00	70		Noise hood / Silencer
PM2/E19	+10.00	70		Noise hood / Silencer
PM2/E20	+10.00	70		Noise hood / Silencer
PM2/E21	+10.00	70		Noise hood / Silencer
PM2/E22	+10.00	70		Noise hood / Silencer
PM2/E23	+10.00	70		Noise hood / Silencer
PM2/E24	+10.00	70		Noise hood / Silencer
PM2/E25	+10.00	70		Noise hood / Silencer
PM2/E26	+10.00	70		Silencer
PM2/E27	+23.00	75		Silencer
PM2/E28	+23.00	75		Silencer
PM2/E29	+27.50	70		Silencer

ID	OAD height, m	Sound Pressure Level at 1 m, dB L_{pA}	Sound Power Level, dB L_{WA}	Noise reduction incorporated into design
PM2/E30	+27.50	70		Silencer
PM2/E31	+27.50	70		Silencer
PM2/E32	+27.50	70		Silencer
PM2/E33	+27.50	70		Silencer
PM2/E34	+27.50	75		Silencer
PM2/E35	+27.50	75		Silencer
PM2/E36	+27.50	75		Silencer

Table 5-3: Noise emission data for external chimney / stack sources

To reflect a worst-case scenario, all the operational noise sources were assumed to be in continuous operation for the full specific sound level assessment i.e. 1-hour during the day and 15 minutes at night.

5.2.4 HGV movements associated with the site

Within the model, noise levels generated by the HGV movements have been calculated based on the linear 'Haul Road' methodology of BS 5228.

It has been assumed within the calculations that the sound power level of a HGV is 105.5 dBA as calculated from the maximum permitted value in EC Directive 92/97/EC. The on-site speed limit factored into the calculation is 16 km/h (10 mph).

It is understood from the Transport Consultant that the worst-case movement of HGVs around the development have been assumed to be as following with regards to the daily total and during peak hours (as detailed in Curtins Report Ref: 073080-CUR-00-XX-RP-TA-V02 Rev V02).

- Phase 1 total daily – 115 movements
- Phase 1 peak hour – 10 movements
- Phase 2 total daily – 239 movements
- Phase 2 peak hour – 20 movements

In the absence of specific movements during a worst case overnight hour, it has been assumed that any given 15 minute of the night may experience the total movements per day equally divided into a percentage equal to a 15 minute segment out of a total 24 hour period (i.e. Phase 1 - 2 movements and Phase 2 - 3 movements per 15-minute night-time period). Since it is understood that the majority of HGV movements are to be during daytime hours, this is considered an onerous assumption.

Movements of HGVs has been based on the Preliminary Swept Path Analysis drawing associated with the scheme layout (no. 73080–CUR–00–XX–DR–TP–05001–P01) by Curtins as detailed in Section 2.3.3 of this report. The movements as discussed above have been split evenly across the three main branches of HGV movements on site.

5.2.5 Receptor locations

The process involved in including each of the point receivers for identified noise sensitive receptors within the model is detailed as follows.

- Receptor A – point receiver located at heights of 1.5 m and 4 m to represent ground and first floor levels, in location that is on closest boundary to site with greatest direct line of sight exposure, considered representative of worst-case levels incident on the general Garden City area.

- Receptor B – point receivers located at heights of 1.5 m and 4m to represent ground and first floor levels, at row of proposed homes closest to site as deducted from the Environmental Noise Report accepted as part of planning (Report Ref: UK.9682352/03 – 29th April 2021)
- Receptor C - point receiver located at heights of 1.5 m and 4 m to represent ground and first floor levels, in location that is on closest boundary to site with greatest direct line of sight exposure, considered representative of worst case levels incident on the proposed area where residential has been proposed as part of the outline application

All the above receiver locations are displayed on the graphical results as provided in Appendix G.

5.3 Determination of BS 4142 Acoustic Feature Corrections

The specific sound levels associated with the proposed development must be corrected in terms of the subjective prominence of the impact of the sound at sound-sensitive receivers, and the extent to which acoustically distinctive characteristics will attract attention.

ICT UK Ltd has confirmed that sound sources considered are typically broad-band in nature, without specific tonal elements and chimney / exhaust stack noise sources will not be distinctive in terms of impulsiveness and intermittency.

The following character corrections for acoustic features have been added to the rating level external noise sources:

- **External stack / chimney emissions**: +3 dB - 'Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment.
- **HGVs**: +3 dB - 'intermittency of the specific sound is readily identifiable against the residual acoustic environment at the receptor i.e. it has identifiable on/off conditions.'

6.0

Noise impact assessment

6.0 Noise impact assessment

6.1 Noise modelling results

Figure 6-1 and Figure 6-2 show the noise rating level map (i.e. inclusive of BS 4142 acoustic feature corrections as detailed in Section 5.3) based upon the operation of the noise sources listed above for Phases 1+2, which is representative of the worst case scenario. The noise maps have a calculation height of 4 m to display the noise impact at first floor residential window level (a worst case as ground floor levels are reduced). These figures are also presented in Appendix G.

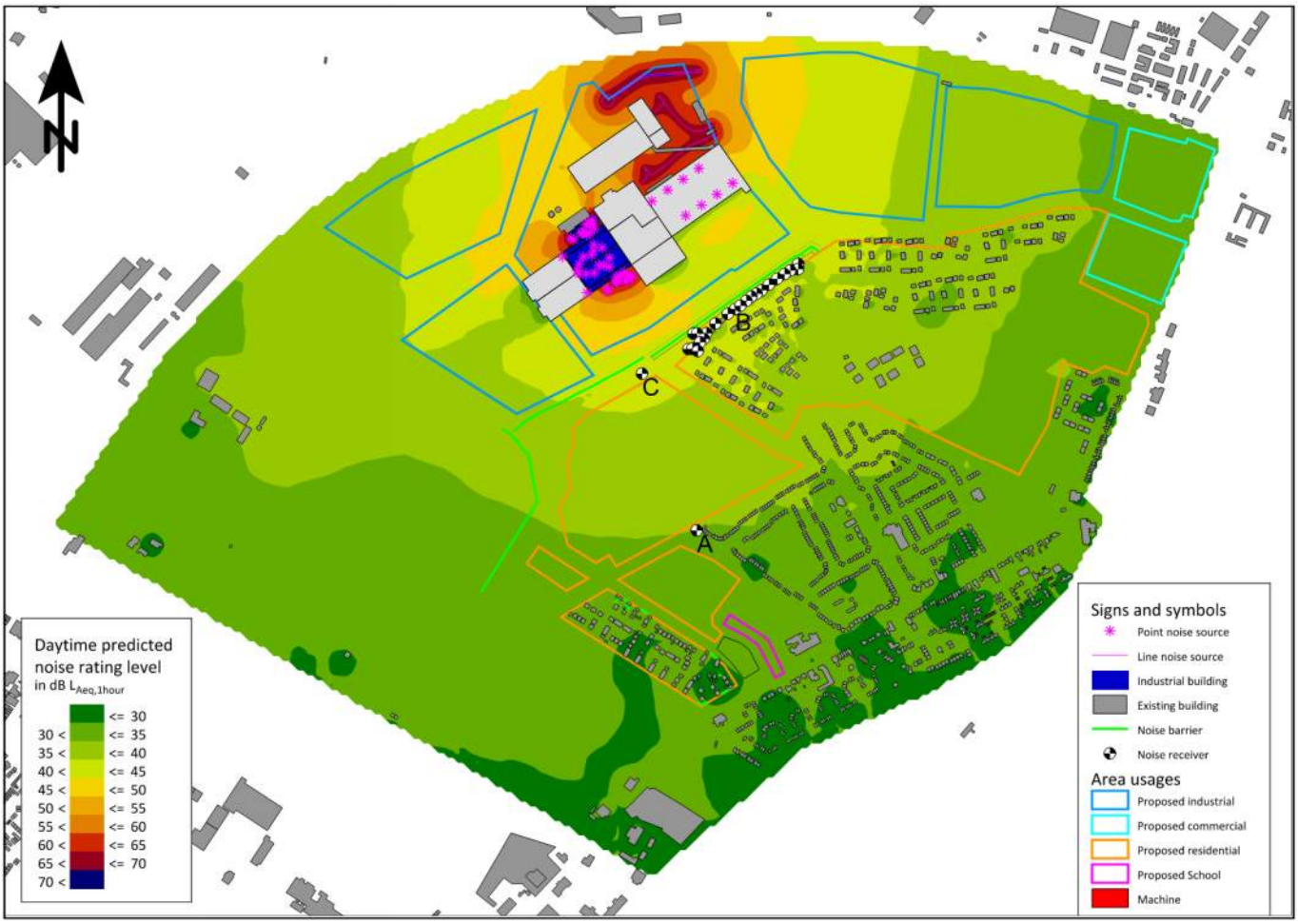


Figure 6-1: Predicted Phase 1 + 2 daytime grid noise map at height of 4 metres

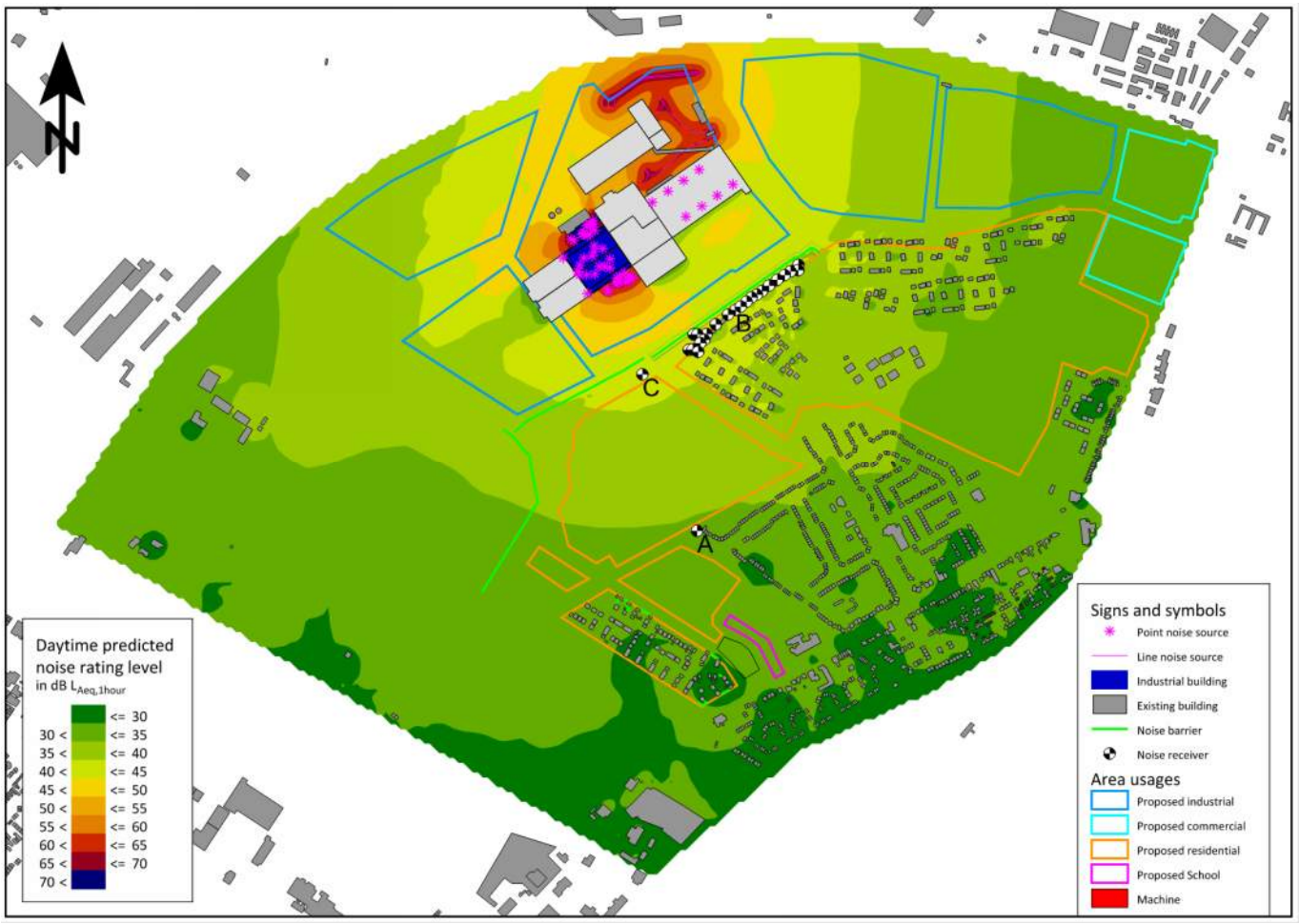


Figure 6-2: Predicted Phase 2 night-time grid noise map at height of 4 metres

Table 6-1 shows predicted sound levels at the most exposed sensitive receptors at 4 m above ground level (i.e. representative of the height of first floor bedroom windows). The predicted sound levels include BS 4142 acoustic feature corrections applied to chimneys / exhaust stack sources and HGVs as discussed in Section 5.3, and so are expressed as BS 4142 rating noise levels.

Receptor	Phase 1		Phase 1 + 2	
	Daytime $L_{Ar,1\ hour}$ dB	Night-time $L_{Ar,15\ min}$ dB	Daytime $L_{Ar,1\ hour}$ dB	Night-time $L_{Ar,15\ min}$ dB
A	35	35	38	38
B	41	41	44	44
C	38	38	42	42

Table 6-1: Predicted BS 4142 rating levels 4m above ground

6.2 BS 4142 Assessment Summary & Discussion

The magnitude of impact is assessed by subtracting the measured background sound level at a location representative of the nearest sound-sensitive receiver, from the rating level.

Typically, the greater the difference between the background and rating level, the greater the magnitude of impact, although BS 4142 emphasises that this is highly context-specific.

With reference to difference between the BS 4142 rating level and existing background levels, Table 6-2 summarises the assessment for then highest noise levels precited across the two Phases for first-floor (i.e. worst case) receptors.

Receptor	Period	Rating Level / dB $L_{Ar,15min}$	Background Sound Level / dB $L_{A90,15min}$	Difference
C	Day	38	47	-9
	Night	38	40	-2
F	Day	44	47	-3
	Night	44	40	+4
G	Day	42	47	-5
	Night	42	40	+2

Table 6-2: Impact of noise from operational phase

6.3 Context of the numerical assessment

It can be seen from the results in Table 6-2 that the predicted rating levels are all less than 5 dB above the derived representative background sound level.

During daytime and night-time at receptor C, predicted rating levels are below background levels, such that BS 4142 advises "*this is an indication of the specific sound source having a low impact*".

During the daytime at receptors F and G, predicted rating levels are below background levels during daytime and night-time, such that BS 4142 advises "*this is an indication of the specific sound source having a low impact*".

During the night-time at receptors F and G, predicted rating levels exceed background levels by 4 and 2 dB respectively, although this is the below the level at which BS 4142 advises "*an indication of an adverse impact*".

Overall, no adverse impacts are identified due to operational noise.

Consideration of the context is pertinent considering the nature of the acoustic environment, the specific sound source, and the affected receptors. The wider area around the site contains industrial plots and further industrial land is proposed as part of the wider outline planning permission.

The only receptors that will experience noise levels above existing background levels (F and G) are for residential areas that have been approved as part of the outline permission to exist alongside the industrial plots proposed.

Background sound levels at these receptors will also increase between the survey being undertaken and the occupation of homes, due to levels of traffic increasing as the wider outline application development s are completed and occupied.

As such, it is expected that where rating levels have been calculated to exceed background sound levels, this difference in excess of rating levels over background sound levels will gradually decrease upon future occupation of these residential properties.

7.0

Noise control

7.0 Noise control

As discussed in Section 6.3, no adverse impacts due to operational noise are identified. No additional mitigation measures are considered to be required, however the below section summarises the embedded measures that were included in the initial assessment and modelling.

The external building fabric constructions will be designed to see that the following weighted sound reduction index values as proposed and considered within noise modelling assessment (see Section 5.2.2) are maintained:

- Wall and roof constructions providing broadband sound reduction of 24 dB R_w.

Product description	Octave band centre frequency (Hz)						
	63	125	250	500	1k	2k	4k
Kingspan AW/60 + no lining	15	16	19	23	26	22	39

Table 7-1: Cladding octave band SRI

Section 2.3.2 identifies where noise emission from individual flue / stack emission sources will be embedded into the design and controlled via acoustic mitigation (e.g. silencers or noise hoods) to see that the sound power level values presented and included within the noise modelling assessment are not exceeded. Also detailed are stack / chimney sources being designed to discharge vertically, with the resultant benefits of acoustic directivity losses at nearby noise-sensitive receptors having been considered within the 3D noise modelling process.

Section 5.2.1 details mitigation measures to be adopted at proposed residential dwellings on the opposite side of the Welsh Government constructed commercial spine road within the Operational Phase industrial noise modelling exercise. It is understood that these boundary mitigation measures will be completed prior to the occupation of dwellings at the affected development plots. Where a 2.5 m barrier has been modelled at Receptor G, this would mainly provide acoustic screening benefits to lower stack sources during Phases 1 & 2 i.e. when the barrier would block line-of-sight to these sources.

8.0

Uncertainty

8.0 Uncertainty

8.1 Noise Survey

In accordance with BS 4142, the uncertainty associated with the undertaking of the noise survey requires discussion. Uncertainty for the noise survey was minimised using the following steps:

- Measurements were carried out at locations which were considered representative of the nearest noise sensitive receptors to the Site
- Measurement positions were located in free field conditions and not in close proximity to items that may have dominated the measurement position (e.g. adjacent to plant or vegetation)
- Measurements were undertaken over an extended time period to include both a midweek and weekend period where the prevailing baseline sound levels were logged continuously
- Wind speeds were measured and general weather conditions were noted on site at the setup and collection of the survey, and these observations were used in conjunction with weather conditions monitored using local weather reports
- The equipment was set-up, collected and field calibrated by a suitably qualified acoustician
- Instrumentation was Class 1 approved in accordance with Section 5 of BS 4142:2014+A1:2019.

8.2 Noise modelling parameters

Data for internal noise sources from the PM halls was based on in situ point receiver measurements around an existing paper milling machine that is understood to be representative of the one to be installed within the PM halls has been provided to Cundall by ICT.

The highest level was used in the modelling, and where internal barriers between the PM hall and the outer façade exist, it was onerously assumed that these do not provide further attenuation. This is therefore considered a robust approach where any uncertainties are inherently biased towards a worst case assumptions.

Noise levels for external sources have been provided by ICT. Noise levels of exhausts can be controlled with a great degree of certainty towards a targeted level with the attenuation methods specified by ICT, and a such this elements considered to have a low degree of uncertainty.

The noise levels for the HGVs have been derived from a relevant British Standard (BS 5228) which again provides a good degree of certainty.

8.3 Noise modelling results

The noise predictions were undertaken utilising the SoundPLAN noise modelling software and a validated calculation method (the algorithms contained in BS EN ISO 12354-4:2017 and BS EN ISO 9613-2:1996); therefore, it is considered the predicted levels are as accurate as reasonably practicable i.e., ± 3 dB.

8.4 Impact of Uncertainties

The majority of elements of the BS 4142 assessment are considered to have a low degree of uncertainty. Where the greatest source of uncertainties have been identified in the modelling process, these are biased towards worst-case assumptions, which is considered a robust approach in reducing uncertainty. It is therefore considered that the uncertainties would not have a significant impact on the conclusions of the BS 4142 assessment.

9.0

Personnel

9.0 Personnel

In accordance with BS 4142 requirements, the assessment has been undertaken by a suitably qualified acoustic consultant holding a recognised acoustic qualification and membership of an appropriate professional body.

This noise report was authored by Simon Everett. All work was checked by Michael Pimlott and verified by Colin O'Connor. Andrew Parkin is the Project Partner in overall responsibility for acoustics. Credentials are provided below:

- Simon Everett: Senior. Acoustics consultant for 7 years; BSc(Hons), MSc, Member of the IOA (MIOA);
- Michael Pimlott: Principal. Acoustics consultant for 10 years; BSc(Hons) Acoustics , Member of the IOA (MIOA);
- Colin O'Connor: Associate. Acoustics consultant for 15 years; BEng(Hons) Acoustical Engineering, Incorporated Engineer (IEng), Member of the IOA (MIOA), Chartered Environmentalist (CEnv), Member of the Institution of Environmental Sciences (MIEnvSc); and
- Andrew Parkin: Partner for Acoustics. Acoustics consultant for 25 years; BEng(Hons) Electroacoustics, Chartered Engineer (CEng), Fellow of the IOA (FIOA).

Cundall are also full members of the Association of Noise Consultants.

Appendices

Appendices

Appendix A Proposed site layout plan Phase 1 + 2

Schedule of Accommodation

Zone	Ground Floor GIA	First Floor GIA	Roof Access GIA	Total GIA	Total GEA	Car Parking including (Acc.) [EVCP]	Cycle Parking / Motorcycle Parking
Phase 1							
Office	635m² / 6,830ft²	629m² / 6,770ft²	15m² / 160ft²	*1,279m² / 13,760ft²*	*1,352m² / 14,553ft²*	97 (7) [5]	20 5
Drivers Gatehouse	90m² / 960ft²	-	-	*90m² / 960ft²*	*110m² / 1,184ft²*	-	-
Entrance Gatehouse	120m² / 1,290ft²	-	-	*120m² / 1,290ft²*	*138m² / 1,486ft²*	-	-
Main Facility	45,010m² / 484,480ft²	2,905m² / 31,260ft²	-	*47,915m² / 515,740ft²*	*48,334m² / 520,263ft²*	158 (8) [8]	50 3
High Bay Warehouse	14,950m² / 160,920ft²	69m² / 740ft²	-	*15,019m² / 161,660ft²*	*15,195m² / 163,557ft²*	-	-
Water Treatment	1,382m² / 14,875ft²	121m² / 1,300ft²	-	*1,503m² / 16,175ft²*	*1,563m² / 16,824ft²*	-	-
Mill Station	107m² / 1,150ft²	-	-	*107m² / 1,150ft²*	*117m² / 1,259ft²*	-	-
TOTAL PHASE 1 ACCOMMODATION				***66,033m² / 710,735ft²***	***66,809m² / 719,126ft²***	*255 (15) [13]*	70 8
Phase 2							
Office	-	-	-	-	-	-	-
Drivers Gatehouse	-	-	-	-	-	-	-
Entrance Gatehouse	-	-	-	-	-	-	-
Main Facility	15,865m² / 170,760ft²	948m² / 10,200ft²	-	*16,813m² / 180,960ft²*	*16,885m² / 181,748ft²*	-	-
High Bay Warehouse	-	-	-	-	-	-	-
Water Treatment	-	-	-	-	-	-	-
Mill Station	107m² / 1,150ft²	-	-	*107m² / 1,150ft²*	*117m² / 1,259ft²*	-	-
TOTAL PHASE 2 ACCOMMODATION				***16,920m² / 182,110ft²***	***17,002m² / 183,007ft²***	-	-
TOTAL ACCOMMODATION				***82,953m² / 892,845ft²***	***83,811m² / 902,133ft²***	***255 (15) [13]***	***70 8***

Notes:
- Electric vehicle car charging to be 5% delivered of total number of car parking spaces and 5% ducted for future installation.
- Areas shown subject to confirmation

Min. 8m maintenance access required to Shotwick Brook and Northern Drain as required by NRW. Note that this maintenance zone falls outside the planning application boundary

AREA TO BE SEEDED WITH GRASS BUT SAFEGUARDED FOR FUTURE POTENTIAL EXTERNAL PLANT - NOT INCLUDED IN THIS PLANNING PERMISSION

HBW FOOTPRINT = 11,169 m² / 120,222 ft²

RED LINE PLOT BOUNDARY 23.86 HA / 58.96 ACRES

ELECTRIC VEHICLE CAR PARKING SPACES SHOWN AS 'E'. SPACES TO BE DUCTED SHOWN 'D'.

Min. 8m maintenance access required to Shotwick Brook and Northern Drain as required by NRW. Note that this maintenance zone falls outside the planning application boundary

Min. 8m maintenance access required to Shotwick Brook and Northern Drain as required by NRW. Note that this maintenance zone falls outside the planning application boundary

SUB STATION AND ASSOCIATED LANDSCAPING AND ENABLING WORKS ARE ALL OFF PLOTS WORKS SUBJECT TO SEPARATE PLANNING APPLICATIONS AND OR APPROVALS BY CHEL

GAS METER

EMERGENCY ACCESS ONLY

WELSH GOVERNMENT COMMERCIAL SPINE ROADS 2 AND 3 AND ASSOCIATED INFRASTRUCTURE IS SUBJECT TO SEPARATE RESERVED MATTERS APPLICATIONS APP. REF: 063191 AND 063187

HBW_L1
173000

DISPATCH_M
7980

TW
24153

COGENERATION_1
61997

COGENERATION_2
61997

REWINDER_E

B2B_E

RAW MATERIALS_G1

PULP STORAGE_A1

BALE HANDLING_B1

PM HALL_B1

PULP STORAGE_A2

BALE HANDLING_B2

PM HALL_B2

JUMBO ROLLS STORAGE_F1
501851

JUMBO ROLLS STORAGE_F2
100888

CONVERTING_G1
175400

mill station

Firefighting

PM Spare Parts

CIVIL (OFFICES) REFUSE AREA
INDUSTRIAL REFUSE AREA

NOTES AEWTP026C

- All dimensions and levels are to be checked on site.
- Any discrepancies are to be reported to the architect before any work commences
- This drawing shall not be scaled to ascertain any dimensions. Work to figured dimensions only.
- This drawing shall not be reproduced without express written permission from AEW.
- Title overlay drawings and ownership boundaries are produced using all reasonable endeavors. AEW cannot be responsible for the accuracy or scale discrepancy of base plans supplied to them.
- All works are to be undertaken in accordance with Building Regulations and the latest British Standards.
- All proprietary materials and products are to be used strictly in accordance with the manufacturers recommendations.

CDM 2015

Client notified of duties: **Yes**

Principal Designer: **TBC**

Unless noted below, all known hazards have been highlighted on the drawing:

0 20 40 60 80 100m

Scale 1:2500 @ A1

Fletcher Rae Plot boundary and infrastructure underlay taken from drawing ref: 13001_SK222_Plot C Boundary Plan - Additional Land - Option 1.

REV	Date		
P9	22/10/21	TF	DOH
Min 8m maintenance zone reserved to Shotwick Brook			
P8	21/10/21	TF	DOH
Dimensions from the boundary to the bottom bank of Shotwick Brook shown.			
P7	17/09/2021	MB	DOH
Dims updated, Mill station 2-3 added.			
P6	14/09/2021	MB	DOH
Additional dims added. HBW footrpint noted.			
P5	24/08/2021	TF	DOH
Schedule of accommodation updated to Lichfields comments. References to off-plot infrastructure by others added.			
P4	20/08/21	MB	DOH
Layout updated based on client's comments. Areas updated			
P3	09/08/21	MB	DOH
Layout updated to latest Client layout.			
P2	28/07/21	TF	DOH
Layout updated to latest Client layout. Red line updated to correct base information.			
P1	20/07/2021	MB	DOH
Initial issue			

REV Date Drawn by: - Checked by: -

Status: S2 — Purpose of Issue: For Information

drawing stage: **Stage 3**

client: **Industrie Cartarie Tronchetti SpA**

project: **ICT Paper Mill Deeside**

drawing title: **Proposed Site Layout Plan Phases 1 and 2**

date 20/07/2021 drawn MB

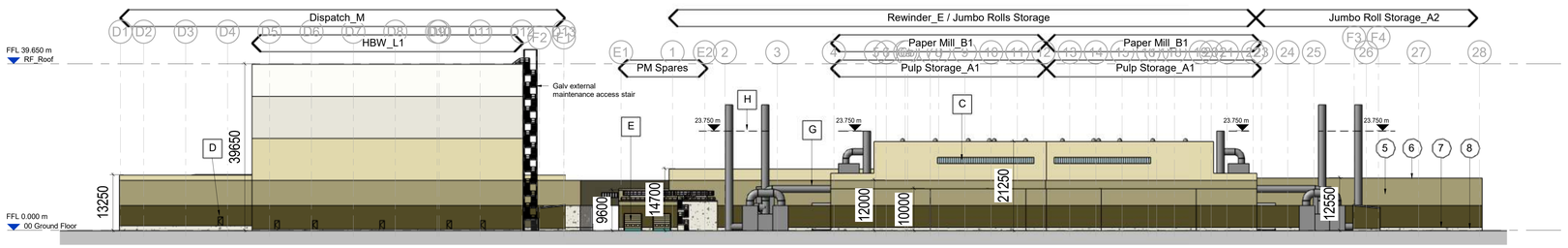
scale@A1 1:1250 checked DOH

Rev **P9**

Job No **12500-AEW-SI-XX-DR-A-0508**

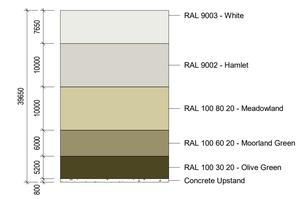
aew architects
0161 214 4370
www.aewarchitects.com

Appendix B Proposed site elevations



Phase 2 - West Elevation GA

Scale @ 1 : 500



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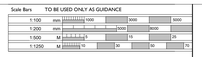

NOTES

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- All works are to be undertaken in accordance with Building Regulations and the latest British Standards.
- All proprietary materials and products are to be used strictly in accordance with the manufacturers recommendations.

This drawing contains the following model files: -

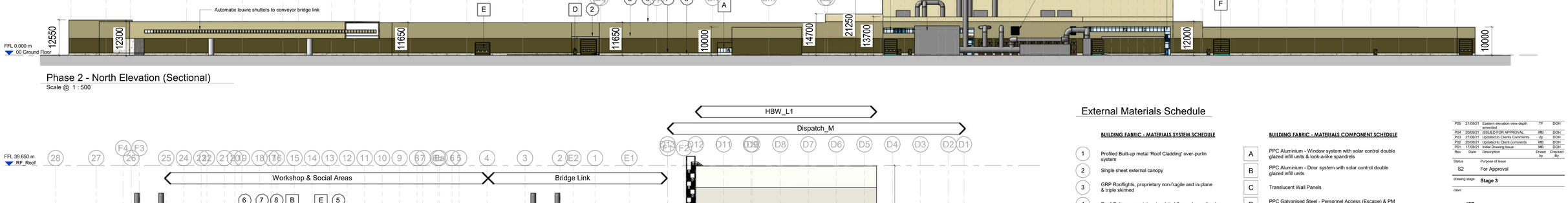
12500-AEW-B1-XX-M3-A-0001

CDM 2015

Client notified of duties: **YES**

Principal Designer: **ICT**

Unless noted below, all known hazards have been highlighted on the drawing:



Phase 2 - South Elevation GA

Scale @ 1 : 500

Phase 2 - North Elevation

Scale @ 1 : 500

Phase 2 - North Elevation (Sectional)

Scale @ 1 : 500

Phase 2 - East Elevation GA

Scale @ 1 : 500

External Materials Schedule

BUILDING FABRIC - MATERIALS SYSTEM SCHEDULE

1	Profiled Built-up metal 'Roof Cladding' over-purlin system
2	Single sheet external canopy
3	GRP Rooflights, proprietary non-fragile and in-plane & triple skinned
4	Roof Gutters, proprietary insulated & membrane lined
5	Profiled Built-up metal 'Wall Cladding' vertically laid system
6	PPC Aluminium 'Parapet Coping' flashing
7	PPC Aluminium 'Base Drip' flashing
8	Concrete Wall Plinth

BUILDING FABRIC - MATERIALS COMPONENT SCHEDULE

A	PPC Aluminium - Window system with solar control double glazed infill units & look-a-like spandrels
B	PPC Aluminium - Door system with solar control double glazed infill units
C	Translucent Wall Panels
D	PPC Galvanised Steel - Personnel Access (Escape) & PM Facade Doorset
E	Sectional Insulated Shutter
F	External Louvre
G	Exhaust Stack/Roof Ventilators
H	Indicative External Plant to ICT requirements

Rev	Date	Description	Drawn by	Checked By
P05	21/09/21	Eastern elevation view depth amended	TF	DOH
P04	20/09/21	ISSUED FOR APPROVAL	MB	DOH
P03	27/08/21	Updated to Clients Comments	dp	DOH
P02	20/08/21	Updated to Client comments	MB	DOH
P01	17/08/21	Initial Drawing Issue	MB	DOH

Status: S2 — For Approval

drawing stage: **Stage 3**

client: **ICT**

project: **ICT Paper Mill Deeside**

drawing title: **Process Buildings - Proposed GA Elevations - Phase 1 & 2**

date: 08/02/21 drawn: MB

scale @ A0: As indicated checked: DOH

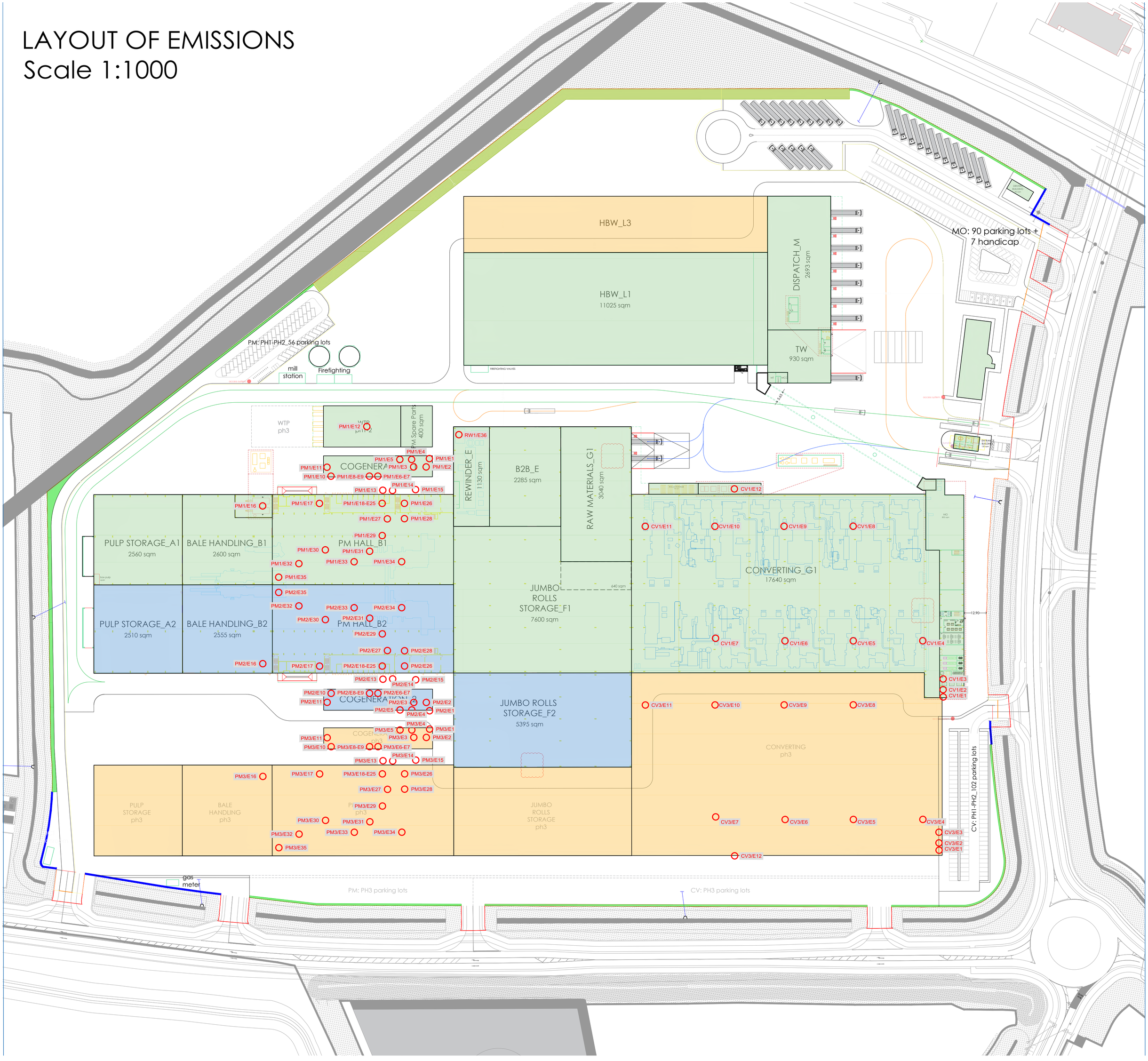
Rev: **P05**

Dwg No: **12500-AEW-B1-XX-DR-A-0534**

aew architects
0161 214 4370
www.aewarchitects.com

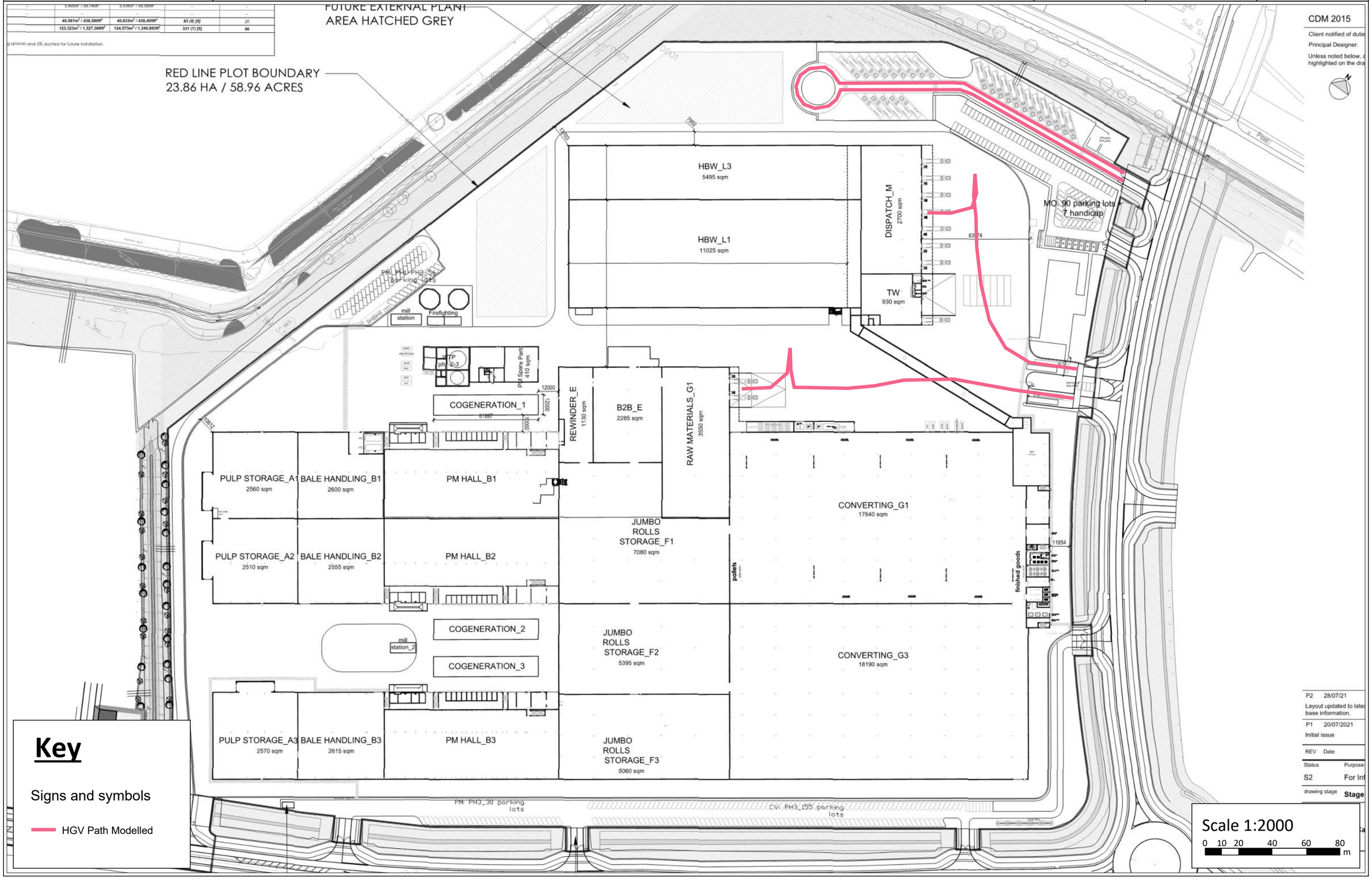
Appendix C Emissions layout plan

LAYOUT OF EMISSIONS
Scale 1:1000



Appendix D Modelled HGV pathway

CUNDALL	Project. ICT Paper Mill	Revision. P01	Job no. 1022988	Made by. SCE
	Title. Modelled HGV Path	Date. 21/03/2023	Scale. As Indicated	Page No. 1 of 1



Appendix E Noise sensitive receptors plan

1022988 | A2

DO NOT SCALE FROM THIS DRAWING

Receptor Key

- (A) Noise sensitive receptor
- Future residential land use
- Existing residential land use

Receptor labelling

A - Residential, Garden City

B - Future residential

C - Future residential

Issue	Date	Description	By	Chkd	Verfd
P1	24/02/23	First Issue	SE	MP	MP

Project

ICT Paper Mill, Northern Gateway

Client

Industrie Cartarie Tronchetti UK Ltd

Title

Permitting Noise Receptor Plan

Drawing No.	Drawing Status
ASXX(80)4002	S2
Job No.	**Scale**
1022988	NTS

Originator	Checker	Verified	Issue
SE	MP	MP	P1

CUNDALL

Fourways House, 57 Hilton Street, Manchester,
M1 2EJ
Telephone: +44 (0)161 244 5660

Website: www.cundall.com

True scale at 1:1

Appendix F Calibration certificates

CERTIFICATE OF CALIBRATION

Date of Issue: 22 July 2021

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Certificate Number: TCRT21/1508

Approved Signatory

K. Mistry

CUSTOMER	Cundall 4th Floor Partnership House Regent Farm Road Gosforth Newcastle upon Tyne NE3 3AF
ORDER No	5412
Job No	TRAC21/07299
DATE OF RECEIPT	21 July 2021
PROCEDURE	Calibration Engineer's Handbook, section 25
IDENTIFICATION	Sound level meter Casella CEL type 633C serial No 1211405 connected via a preamplifier type 495 serial No 001211 to a half-inch microphone type 251 serial No 02626. Associated calibrator Casella CEL type 120/1 serial No 3574169 with a half-inch housing.
CALIBRATED ON	22 July 2021
PREVIOUS CALIBRATION	Calibrated on 17 July 2020, Certificate No. TCRT20/1391 issued by this laboratory.

The sound level meter was set up using the type 120/1 sound calibrator supplied; it was set to frequency weighting A, and initially read 114.3 dB. It was then adjusted to read 114.1 dB (corresponding to 114.1 dB at standard atmospheric pressure). This reading was derived from Calibration Certificate no. TCRT21/1506 supplied by this laboratory and manufacturers' information on the free-field response of the sound level meter. The calibration check frequency was 1 kHz.

Procedures based on IEC 61672-3:2006 (BS EN 61672-3:2006) were used to perform the periodic tests.

RESULTS

The sound level meter submitted for testing has successfully completed the class 1 periodic tests carried out, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2 : 2003 (BS EN 61672-2 : 2003), to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1 : 2002 (BS EN 61672-1 : 2003), the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1 : 2002 (BS EN 61672-1 2003).

The self-generated noise recorded with the microphone replaced by the electrical input device was:

14.5 dB (A) 20.0 dB (C) 23.6 dB (Z)

The environmental conditions recorded at the start and end of testing were:

Start: 24 to 25 °C, 41 to 51 %RH and 101.2 to 101.3 kPa
End: 24 to 25 °C, 40 to 50 %RH and 101.1 to 101.2 kPa

Technical information including adjustment data specified in the User Manual HB3356-03 and additional manufacturer's information has been used to carry out this verification. These data include manufacturer-specified uncertainties.

Publicly-available evidence has been found that the Casella CEL 630 Series sound level meter design has successfully undergone pattern evaluation in accordance with IEC 61672-2:2002 (BS EN 61672-2:2003) by Physikalisch-Technische Bundesanstalt (PTB), an independent testing organisation responsible for pattern approvals.

All measurement data are held at ANV Measurement Systems for a period of at least six years.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with the *Guide to the Expression of Uncertainty in Measurement* published by the International Organisation for Standards (ISO).

NOTES

1 The instrument was running firmware version 129-02.17

2 It should be noted that the meter is not equipped with an under-range indicator, and care should therefore be taken to restrict measurements to the linearity ranges specified in the User Manual.

3 The data provided by the manufacturer headed "Free field response" have been taken as the effect of the case on the frequency response of the meter, and have been included in the overall frequency response test.

4 No suitable microphone frequency response information was supplied with the instrument. It was therefore measured by this laboratory using the electrostatic actuator method.

END

CERTIFICATE OF CALIBRATION

Date of Issue: 22 July 2021

Certificate Number: TCRT21/1507

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

K. Mistry

CUSTOMER	Cundall 4th Floor Partnership House Regent Farm Road Gosforth Newcastle upon Tyne NE3 3AF
ORDER No	5412 Job No TRAC21/07299
DATE OF RECEIPT	21 July 2021
PROCEDURE	Procedure TP 1 Calibration of Sound Calibrators
IDENTIFICATION	Sound Calibrator Casella CEL type 120/1 serial number 4921893 with half-inch housing
CALIBRATED ON	22 July 2021
PREVIOUS CALIBRATION	Calibrated on 05 February 2021, Certificate No. TCRT21/1095 issued by this laboratory.

CERTIFICATE OF CALIBRATION

MEASUREMENTS

The sound pressure level generated by the Sound Calibrator in its half-inch configuration was measured using a B&K type 4134 microphone with the protective grid in position. The microphone sensitivity was traceable to National Standards.

RESULTS

The mean level of the calibrator output and its fundamental frequency and total distortion were:

Nominal Setting dB	Mean Level	Frequency	Distortion
94	94.14 ± 0.1 dB rel 20 µPa	1000 Hz ± 0.06 %	(0.40 ± 0.04) %
114	114.13 ± 0.1 dB rel 20 µPa	999.99 Hz ± 0.06 %	(0.16 ± 0.03) %

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by ISO.

During the measurements the laboratory environmental conditions were:

Setting dB	Temperature	Atmospheric pressure	Relative Humidity
94	24 to 25 °C	101.3 to 101.4 kPa	41 to 53 %
114	24 to 25 °C	101.3 to 101.4 kPa	42 to 52 %

The tests carried out were as specified in Annex B of BS EN 60942:2003, but with five determinations of sound pressure level, and limited to the above level(s) & freq(s). As public evidence was available from a testing organisation responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the reqirements for pattern evaluation decribed in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2003.

NOTE
The measured sound pressure level given is valid under the environmental conditions stated above. The output of many sound calibrators varies a little with ambient air pressure; however the manufacturer has not supplied a precise correction for this device, stating only that the pressure coefficient is < 0.004 dB/kPa . Additional corrections may be necessary when calibrating a sound level meter fitted with a free-field response microphone; see manufacturers' information for details.

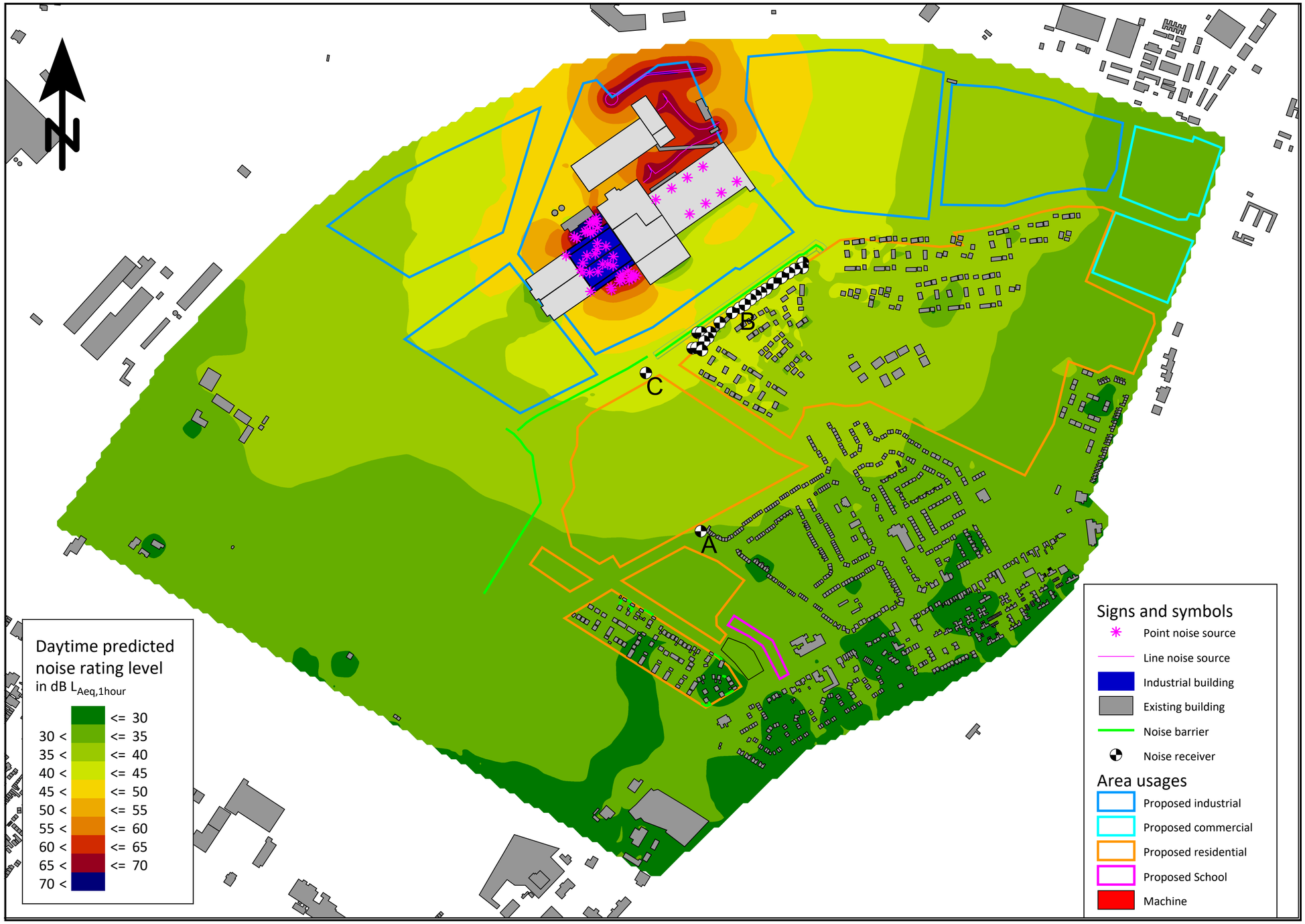
Calibrator adjusted No R 3

END

Appendix G Phase 1 + 2 grid noise maps at 4m

1022988 | A2

DO NOT SCALE FROM THIS DRAWING



Issue	Date	Description	By	Chkd	Verfd
P1	24/02/23	First Issue	SE	MP	MP

Project

ICT Paper Mill, Northern Gateway

Client

Industrie Cartarie Tronchetti UK Ltd

Title

Phase 1 + 2 Grid Noise Map @ 4m - Day-time

Drawing No.	Drawing Status
ASXX(80)4003	S2

Job No.	Scale
1022988	NTS

Originator	Checker	Verified	Issue
SE	MP	MP	P1

CUNDALL

Fourways House, 57 Hilton Street, Manchester, M1 2EJ
Telephone: +44 (0)161 244 5660

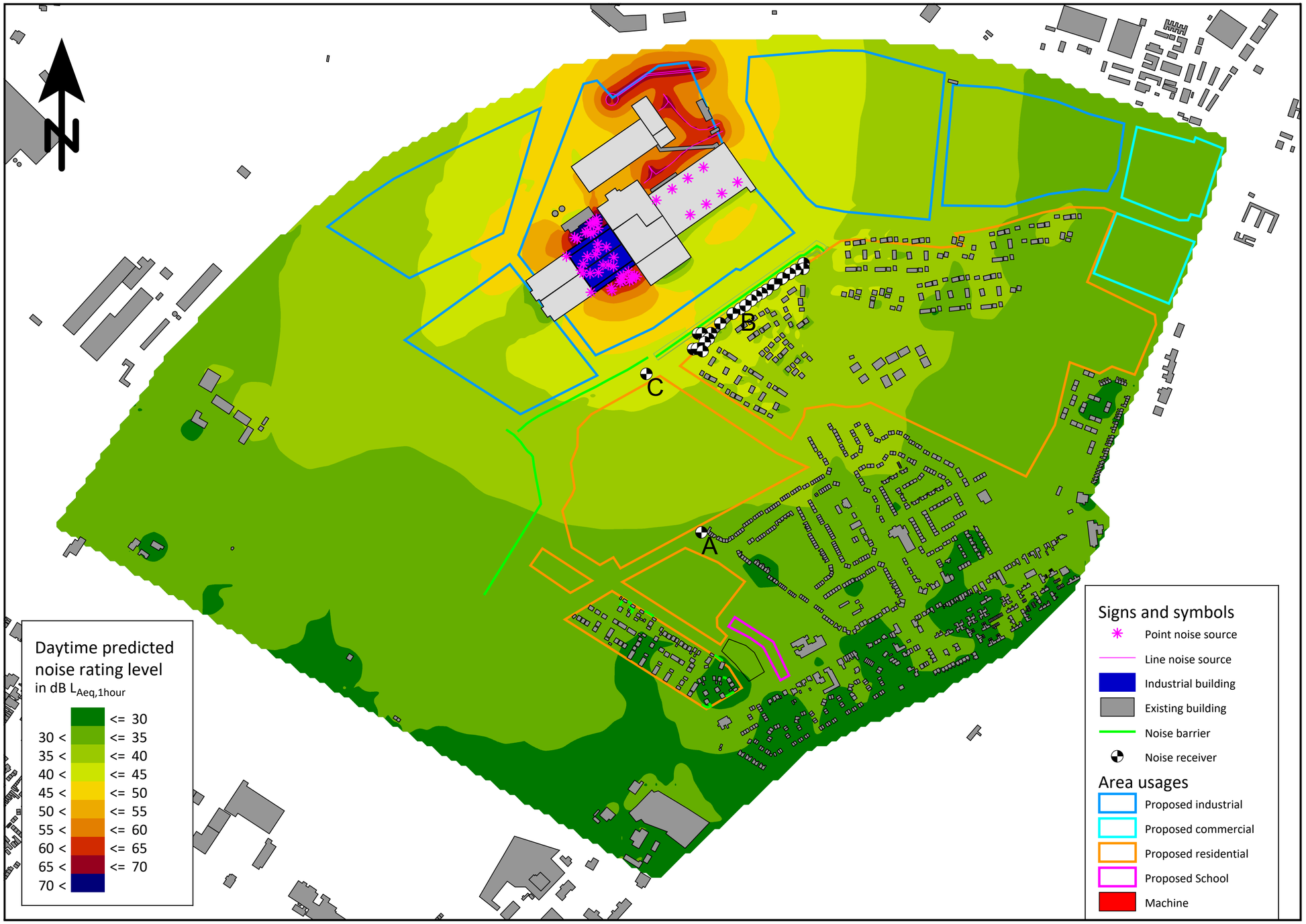
Website: www.cundall.com

True scale at 1:1

1022988 | A2

DO NOT SCALE FROM THIS DRAWING

A



Issue	Date	Description	By	Chkd	Verfd
P1	24/02/23	First Issue	SE	MP	MP

Project

ICT Paper Mill, Northern Gateway

Client

Industrie Cartarie Tronchetti UK Ltd

Title

Phase 1 + 2 Grid Noise Map @ 4m - Night-time

Drawing No.	Drawing Status
ASXX(80)4004	S2

Job No.	Scale
1022988	NTS

Originator	Checker	Verified	Issue
SE	MP	MP	P1

CUNDALL

Fourways House, 57 Hilton Street, Manchester,
M1 2EJ
Telephone: +44 (0)161 244 5660

Website: www.cundall.com

True scale at 1:1

Cundall Johnston & Partners LLP
Fourways House 57 Hilton St Manchester M1 2EJ
Tel:+44 (0)161 244 5660
Asia Australia Europe MENA UK and Ireland
www.cundall.com

ZERO CARBON DESIGN 2030