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Our Ref: R22.0401/DRK

**POWER GENERATION PLANT (RRP) FACILITY AT MINERS ROAD, LLAY,
WREXHAM - PLANNING CONSENT LLA P/2022/0199**

Ref: Compliance with Condition 10 – Noise Attenuation Scheme

Technical Note (Noise)

This Noise Technical Note has been prepared to provide the information required to discharge Condition 10 of Planning Permission P/2022/0199 dated 26th April 2022.

Planning permission was granted for an extension to a reserve power plant and associated infrastructure in 2018 (originally consented under Planning Permission ref. P/2018/0517) on land off Miners Road within Llay Industrial Estate.

Following a review of the approved infrastructure, the developer submitted a Section 73 planning application to amend the internal configuration of the equipment to enable a revised site layout due to changes in technology and equipment. This was approved on 26th April 2022 (ref. P/2022/0199).

The approved revised layout and equipment technical data has been reviewed to produce this Technical Note and proposed noise attenuation details for the scheme.

1. Planning Consent P/2022/0199 Condition 10

Condition 10 of planning consent P/2022/0199 states:

“Prior to commencement of development, the noise attenuation for the scheme shall be identified along with supporting evidence to confirm its suitability. The details of which shall be submitted to and approved in writing by the Local Planning Authority. The evidence shall provide predicted noise levels at sensitive receptors in accordance with BS4142.”

2. Information Reviewed

The information provided by the Applicant and historical reports includes the following:

- NVC Noise Impact Report dated 9th May 2018 (ref. R18.0506/DRK)
- Planning Consent P/2022/0199 dated 26th April 2022
- Miners Road S.73 Phase 1 Drawing No. TFE1000/01/03
- Miners Road S.73 Phase 2 Drawing No. TFE1001/01/03
- Gas Generator Details Drawing No. TFE1001/01/04
- Battery Container Details Drawing No. TFE1001/01/05
- BS4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'
- BS8233: 2014 'Guidance on sound insulation and noise reduction in buildings'
- ISO 9613-2:1996 'Acoustics – Attenuation of Sound Propagation Outdoors'

3. Operation Hours

The plant would, for the majority of the year, operate between 0700-2300 hours (7 days per week). The only times it may operate outside of these hours would be during occasional Capacity Market Events (where National Grid calls for power in an emergency).

4. Prediction Methodology & Results

Operational Noise

Following a review of the revised layout and plant detail, we have carried out further noise predictions at the noise sensitive receptors (NSR) to establish the likely impact and provide details of the Noise Mitigation Scheme.

For site operational noise the assessment used ISO9613-2 prediction modelling and CadnaA software for producing a noise map of the highest likely generated noise during peak noise operations. The Input settings for the noise model include:

Ground factor (G) = 0.5 (mixed ground absorption) Temperature = 10degC

Relative humidity = 70%

Receptor height = Assumed to be 4m above ground for operations.

The methodology takes into account source position, distance and local screening relative to the site location and nearest sensitive receptors (NSRs). The noise modelling assumes that all plant is in operation and therefore the noise predictions provide an indication of the highest likely noise level.

The results of the CadnaA software prediction modelling noise contours for site operations are provided in Appendix 1.

Based on the proposed plant design levels, the predicted noise levels at the NSR positions are as shown in Table 1 and Noise Map 1 attached.

Table 1: Noise Predictions for Plant Operation (all plant running with proposed mitigation measures)

Receptor Position (Refer to Figure 1)	Period	Predicted highest rating noise level LAeq _{15mins/1hour} (dB)	Representative background sound level LA90 [LAeq] dB	Rating Noise Limit LAeq dB	Excess over limits LAeq dB
Residential Receptors					
R1. Nearest receptors South (Llay Road)	Daytime	29-30	39 [48]	39	-10 to -9
	Night-time	29-30	30 [40]	30-35*	-1 to 0
R2. Nearest receptors Northeast (Rackery Lane)	Daytime	28-29	48 [58]	48	-20 to -19
	Night-time	28-29	35 [51]	41	-7 to -6
Receptor Position (Refer to Figure 1)	Period	Predicted highest noise level inside (open window) [outside] LAeq _{8hrs} (dB)	BS8233:2014 Guidance for inside open plan offices [external with open window] LAeq dB	Typical Residual Noise Levels in the Area LAeq dB	Excess over guidance levels LAeq dB
R3. Nearest commercial	Daytime	40-45 [55-60]	45-50** [60-65]	58-59	-10 to 0

*Based on BS4142 guidelines for low impact or sleep disturbance limits when taking into account residual sound levels in respect of context.

**Based on typical residual sound levels and guidelines for levels within open plan offices in accordance with BS8233: 2014 (Table 2). Annex G1 of BS8233:2014 states 'If partially open windows were relied upon for background ventilation, the insulation would be reduced to approximately 15 dB'. With double glazed windows BS8233 advises approximately 30dB reduction is expected.

The following table provides an assessment of the highest likely impact at NSRs, assuming all plant in Phases 1 & 2 are operating under design operating load during night-time periods, in accordance with BS4142: 2014+A1:2019.

Table 2: BS4142:2014+A1:2019 Assessment of mitigated noise at Position R1 (all plant running i.e. highest impact) at Night-time

Results		Relevant	Commentary
Calculated Specific sound level	LAeq(15mins) = 30dB	7.3.6	Specific sound source calculated using ISO9613-2
Background sound level	LA90 = 30dB	8.1.3 8.2	Measured over weekend period deemed to be representative of the background sound.
Assessment during daytime, reference time interval is 15mins		7.2	
Acoustic feature correction	0dB	9.2	No acoustic feature expected due to site noise contribution and much higher residual sound levels.
Rating level	(30 + 0) dB = 30dB	9.2	No significant perceptible noise character predicted
Background sound level	LA90 = 30dB	8	Modal value determined using weekend background sound periods (2300-0700) providing a robust assessment of baseline.
Excess of rating over background sound level	(30 - 30) dB = 0dB	11	
Assessment indicates low impact		11	
Uncertainty	Not significant	10	The excess of the rating level over the background sound level is negative and residual levels are significantly higher (i.e. 40dB LAeq) and the uncertainty of the measurement does not have any significance to the outcome of the assessment. Appropriate standards used for the calculation. All instruments used Type 1, calibrated and in calibration limits for baseline.

5. Conclusions

The above table of results show no exceedance of representative background sound levels and therefore no adverse impacts according to BS4142:2014+A1:2019.

We conclude that the proposed mitigation scheme provided in section 6 would provide a noise attenuation scheme that would be suitable to comply with BS4142:2014+A1:2019, to ensure no adverse impacts would occur, in accordance with the requirements of Condition 10.

6. Noise Mitigation Scheme

Based on the revised layouts, the following noise level and mitigation measures would be introduced in terms of the design noise limits for the plant associated with the development:

- (i) The battery container (2 off) noise level for each unit not to exceed a design level of 75dB(A) Leq_{15mins} @ 1m at design operating load.
- (ii) The battery inverter container (1 off) would be designed to a level not exceeding 75dB(A) Leq_{15mins} @ 1m at design operating load.
- (iii) The switchgear container would be designed not to exceed 65dB(A) @ 1m Leq_{15mins} at design operating load.
- (iv) The transformers designed to a level not exceeding 65dB(A) @ 1m Leq_{15mins} at design operating load.
- (v) Heating/Cooling systems (HVAC) for the battery containerised plant would be designed to a noise level of 75dB(A) @ 1m Leq_{15mins}.
- (vi) Gas Engine Containers (total of 10 on site for both original and extension) with associated radiators, exhaust system and ventilation attenuators each designed to a noise level of 75dB(A) @ 1m Leq_{15mins} at design operating load.
- (vii) Gas Kiosk enclosure designed to a noise level of 65dB(A) @ 1m Leq_{15mins} at design operating load.

7. EV Charging Facility

The Applicant is also proposing to install an Electric Vehicle Charging Facility adjacent to the Power Generation Plant at the northwest corner of the Site. This is currently being determined by Wrexham County Borough Council. This facility will not generate any significant noise and would therefore not contribute to any cumulative impacts from the overall facility.

We trust the above and attached details provides sufficient information to discharge condition 10 of planning permission P/2022/0199.

Yours sincerely,



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Managing Director
Principal Acoustic Consultant

Figure 1: Site Location, Baseline Monitoring Locations and Nearest Sensitive Receptors



Figure 2: Layout of Original Phase 1 Development



Figure 3: Layout of Phase 2 Development

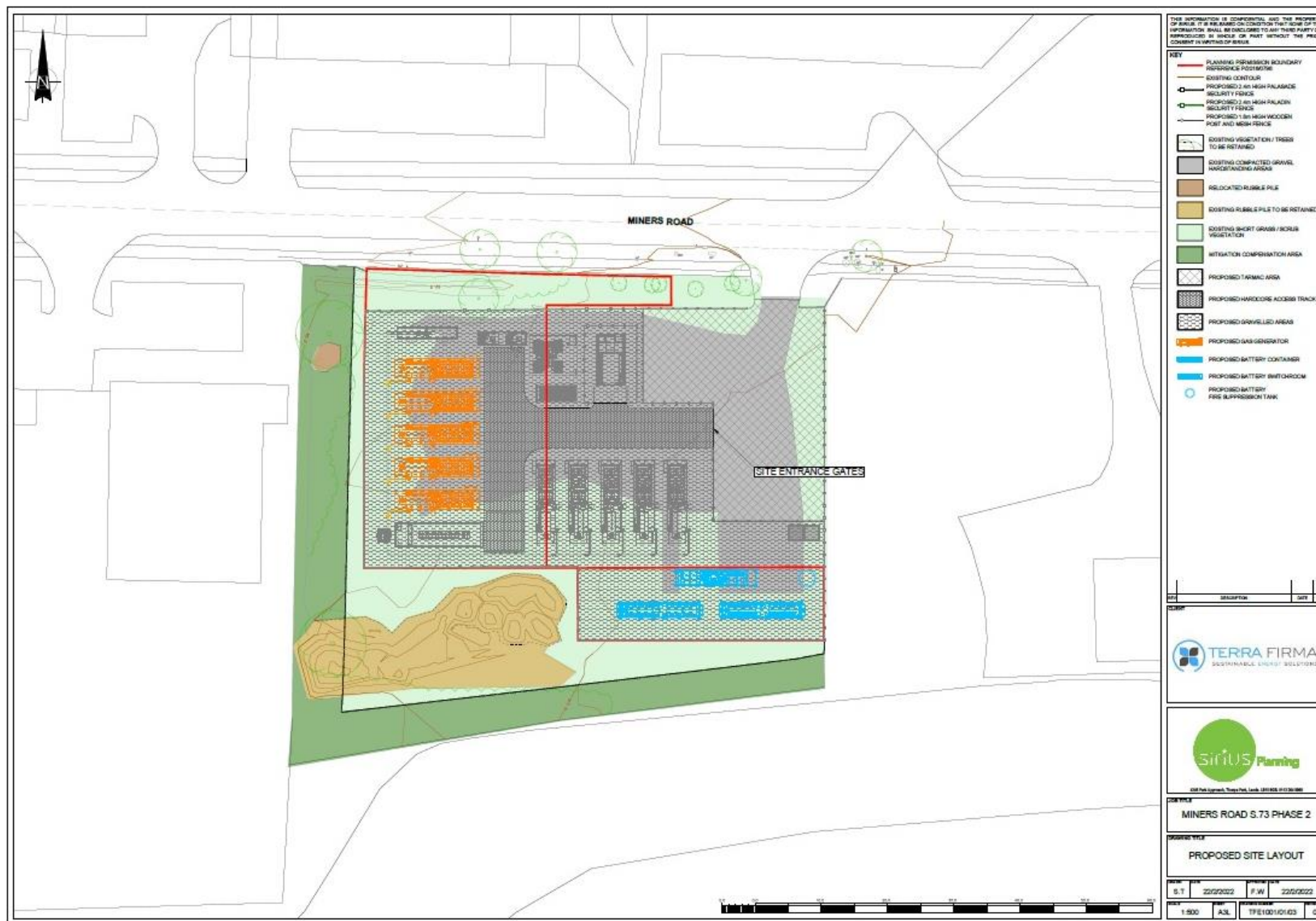


Figure 4: Gas Engine Design Detail – 75dB(A) @ 1m

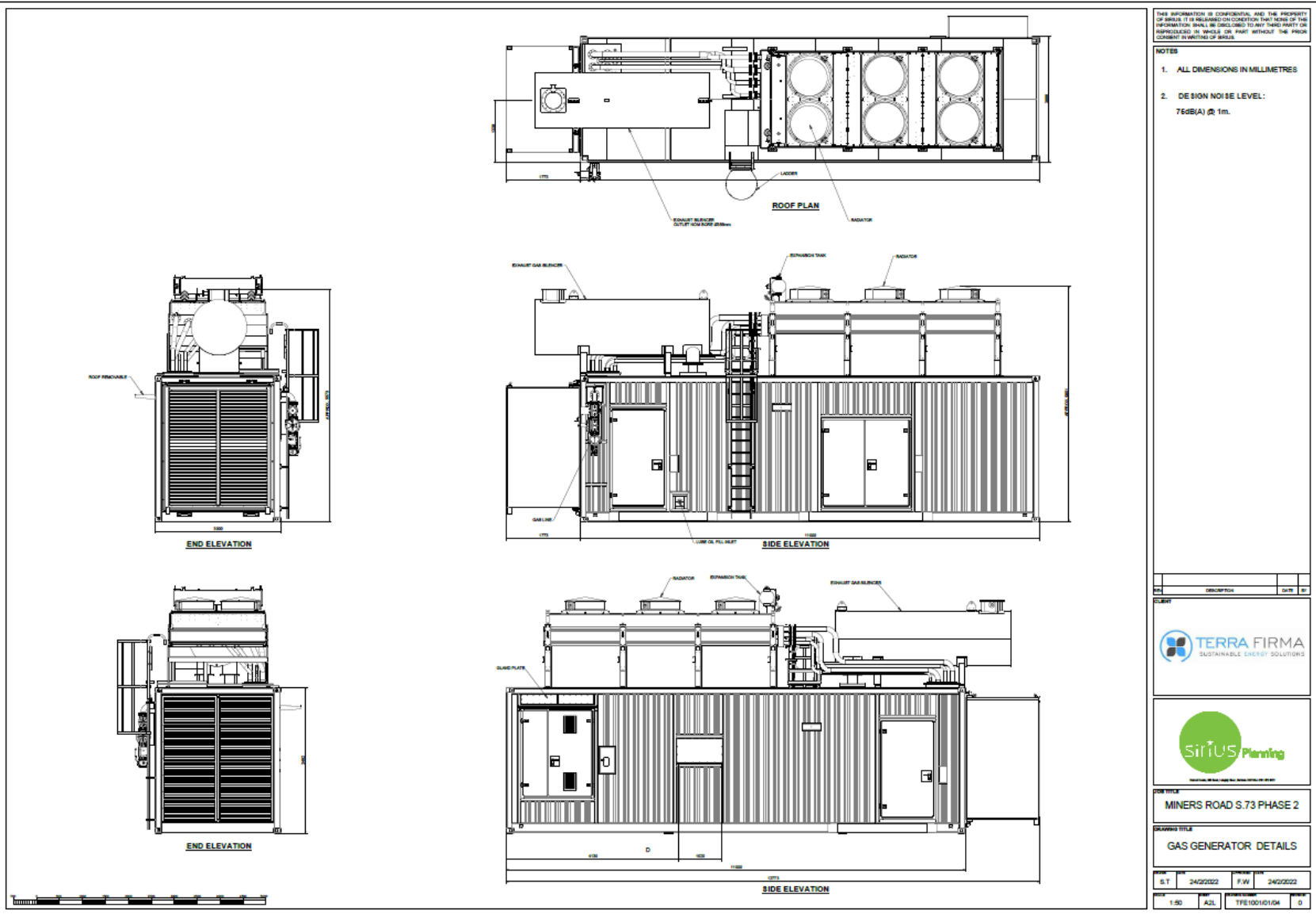
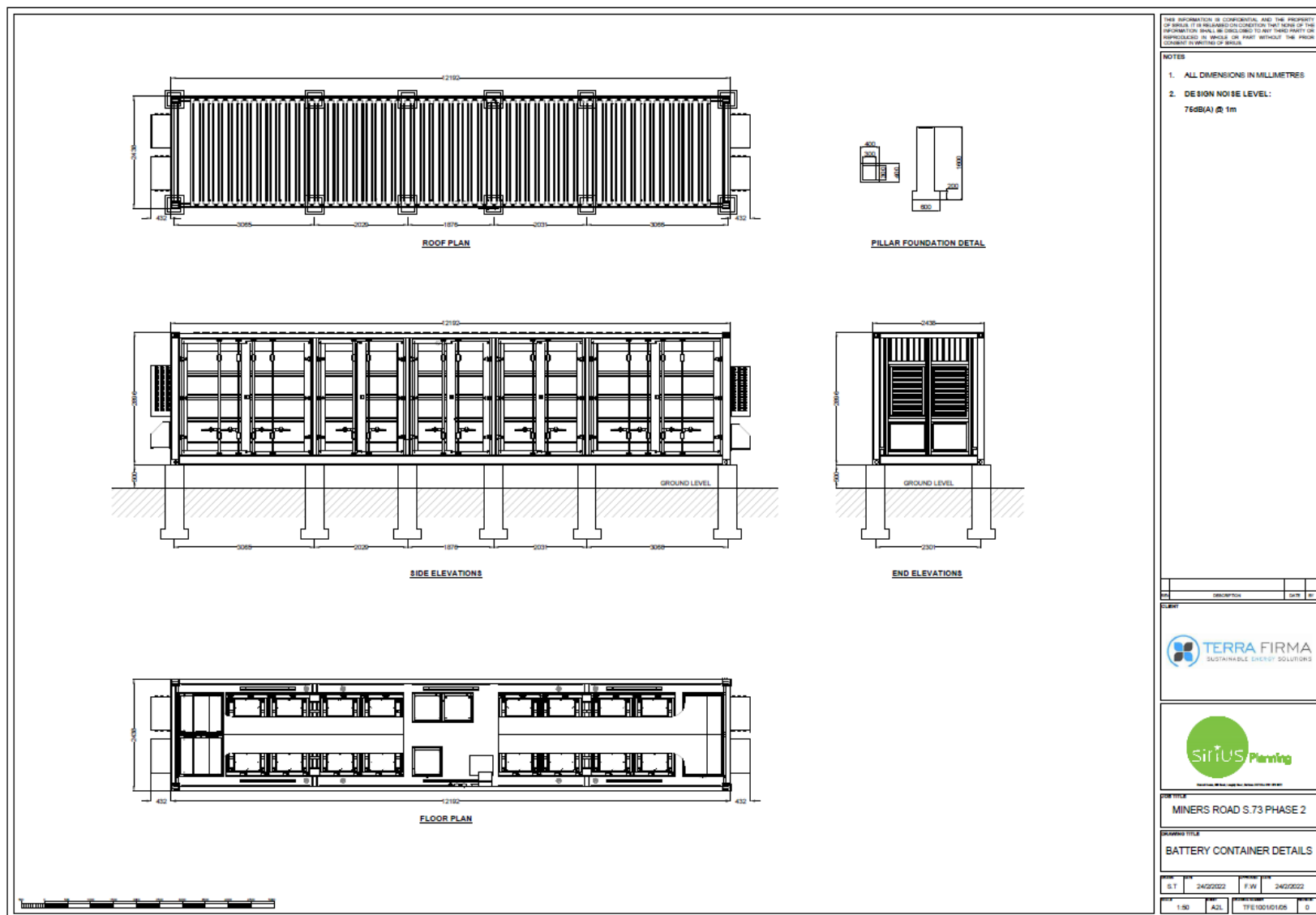


Figure 5: Battery Container Design Detail – 75dB(A) @ 1m



Appendix 1:

Noise Prediction Mapping Results

Noise Map 1: Noise Prediction Model Noise Contour Results (all plant operating Phase 1 & 2)

