

Technical Note: Discharge of Condition 13

Project	70 Great Bridgewater Street, Manchester		
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1 INTRODUCTION

1.1 BWB Consulting Ltd has been appointed by Bridgewater Manchester (Luxembourg) Holding SARL to undertake a noise impact assessment work in support of the application to partially discharge Planning Conditions 13 relating to noise, attached to the planning permission (application ref: 129081/FO/2021) for the redevelopment of 70 Great Bridgewater Street, Manchester.

1.2 Planning Condition 13 states that:

"a) Prior to the installation of any externally mounted ancillary equipment, this equipment shall be acoustically insulated in accordance with a scheme submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the equipment.

Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.

b) Upon completion of the development and within 6 months of the equipment becoming operational, a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that above criteria is met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the noise criteria. This report shall be submitted to and approved in writing by the City Council as local planning authority within 6 months of the equipment becoming operational along with a timescale that confirms when any necessary changes will be implemented.

Reason - To safeguard the amenities of the occupiers of nearby residential accommodation, pursuant to saved policy DC26 of the Unitary Development Plan for the City of Manchester and policies SP1 and DM1 of the Core Strategy".

1.3 This note is intended to be read alongside the Noise Impact Assessment (BWB Document Number: 'MCP2390_70 Great Bridgewater St. Manchester - Discharge of Condition -

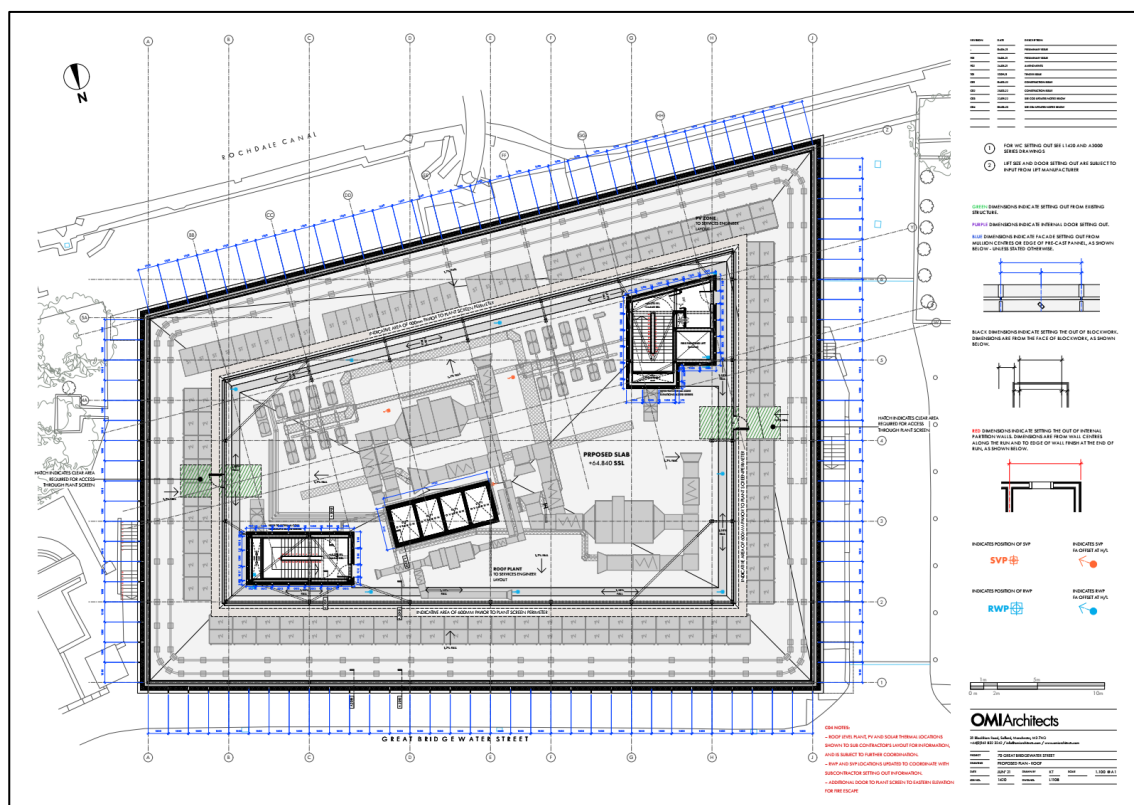
210924_v1.0_Issue'). Since issuing this report, the rooftop plant scheme has developed since then, and a subsequent reassessment has been undertaken.

- 1.4 It is worth noting that the full discharge of planning condition 13 is pending submission of the completion test reports.

Proposed Development

- 1.5 The Proposed Development is understood to comprise the partial demolition and reconfiguration of 70 Great Bridgewater Street to create a new office building (Use Class E), including replacement of building facades, 2-storey extension and alterations to the internal layout including servicing and cycle parking, access, and associated works.
- 1.6 **Figures 1.1 and 1.2** illustrate the details of the rooftop plant type, number, and location associated with the proposed development.

Figure 1.1: Proposed Rooftop Plan



* SOURCE: Rooftop plan drawing produced by OMI Architects Limited (Title: Proposed Plan – Roof – Drawing Ref: L1108).

[illegible]

1.7 It is worth noting that **Figure 1.2** illustrating the 3D roof arrangements highlight that there is a 1500mm parapet at the perimeter and, in board of this a 3000mm high louvre screen.

1.8 The information provided in **Table 1.1** presents the proposed external plant items associated with the development.

Fixed Plant			
Quantity	Manufacturer	Model	Location
19	Mitsubishi	PUHY-P000	Roof Level
1	Mitsubishi	PUMY-P200	Roof Level
2	-	Smoke Shafts	Atmospheric Discharge
3	AHU-TempAir	TempAir 9 7T-EXT	Roof Level
2	Supply/Extract Fans	PureAir PTS-7	Atmospheric Discharge

- 1.9 The anticipated hours of operation are understood to be during standard office working hours between 7am and 7pm.

Noise Sensitive Receptor

- 1.10 The closest existing Noise Sensitive Receptors (NSRs) have been identified as The Bridgewater Hall concert venue, located to the north of the site, Chepstow House, the residential complex to the northeast aspect of the site, the Jurys Inn Hotel to the west, and the Hacienda apartment building to the southwest. These receptors are listed below in **Table 1.2**.

Table 1.2: Nearest Noise Sensitive Receptors

NSR	Description	Direction
NSR 1	Bridgewater Hall Venue	North
NSR 2	Chepstow House; Residential Complex	Northeast
NSR 3	Jurys Inn Hotel	West
NSR 4	Hacienda Apartment Building	Southwest

- 1.11 An impact may be experienced at other receptors, however, given the greater distance, any impact is likely to be less than at those stated above.

2 STANDARDS AND GUIDANCE

BS 4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound

2.1 The BS 4142¹ Standard describes methods for rating and assessing the following:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train movements on or around an industrial and/or commercial site.

2.2 The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. The Standard advises the purpose of the methodology includes the assessment of sound from any plant and activities associated with existing industrial and/or commercial uses at proposed residential dwellings.

2.3 If appropriate, the specific sound level of the source ($L_{Aeq,T}$) is corrected, by the application of one or more corrections for acoustic features such as tonal qualities and/or distinct impulses, to give a 'rating' level ($L_{Ar,Tr}$). The Standard effectively compares and rates the difference between the rating level of the specific sound and the typical background sound level ($L_{A90,T}$) in the absence of the specific sound.

2.4 The Standard advises that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background sound level at the time(s) the source in question operates or is proposed to operate in the future.

2.5 Comparing the rating level with the background sound level, BS 4142 states:

"Typically, the greater this difference, the greater the magnitude of 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."

¹ British Standard (BS) 2014, BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound', British Standards Institution (BSI).

Manchester City Council: Planning and Noise Technical Guidance document

- 2.6 Manchester City Council's (MCC) Planning and Noise Technical Guidance document (Dec 2015) states the following regarding noise and vibration from fixed plant:

'Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location'.

3 Baseline Noise Survey

- 3.1 A baseline noise survey was undertaken at the Site in November 2020 in support of the planning stage noise impact assessment works and is fully documented in the noise assessment, which accompanied the planning submission (BWB Document Number: 'MCP2390_70 Great Bridgewater St. Manchester - Discharge of Condition - 210924_v1.0_Issue').
- 3.2 The measured background sound pressure levels (L_{A90}) at NSRs have been considered to inform Condition 13 criteria relating to fixed plant associated with the development.

4 Noise Assessment

- 4.1 To ascertain the level of noise attenuation required for external fixed plant and discharge Condition 13, noise levels associated with fixed plant have been predicted and assessed against the noise limits at NSRs as detailed in Condition 13.
- 4.2 With the application of MCC's policy on plant noise requiring that external building services plant should achieve a rating level of 5dB ($L_{Ar,T}$) below the typical background (L_{A90}) level at the nearest noise sensitive location. It follows that the maximum plant emission levels ($L_{Ar,T}$) for fixed mechanical plant presented in **Table 1.1** must be met 1m from the façade of the closest noise sensitive properties, as set out in **Table 4.1**.

Table 0.1: Plant Noise Limits at Nearest Noise Sensitive Receptors

Location	Period	Typical Measured $L_{A90,T}$	Plant Noise Emission Limit ($L_{Ar,T}$)
All NSRs	Daytime (07:00 – 23:00)	49	44
	Night-time (23:00 – 07:00)	41	36
Notes: ¹ The background noise levels measured at measurement location ST2 (as detailed in the original noise impact assessment) was used as the most representative levels to determine the plant emission limits at the NSRs.			

- 4.3 An assessment has been undertaken based on the rooftop plant drawing illustrated in **Figure 1.2**. A 3-dimensional (3D) noise model of the Site has been prepared using the

acoustic software package Cadna-A®, which uses the methodology set out in ISO 9613-2², to predict potential noise impact upon the NSRs.

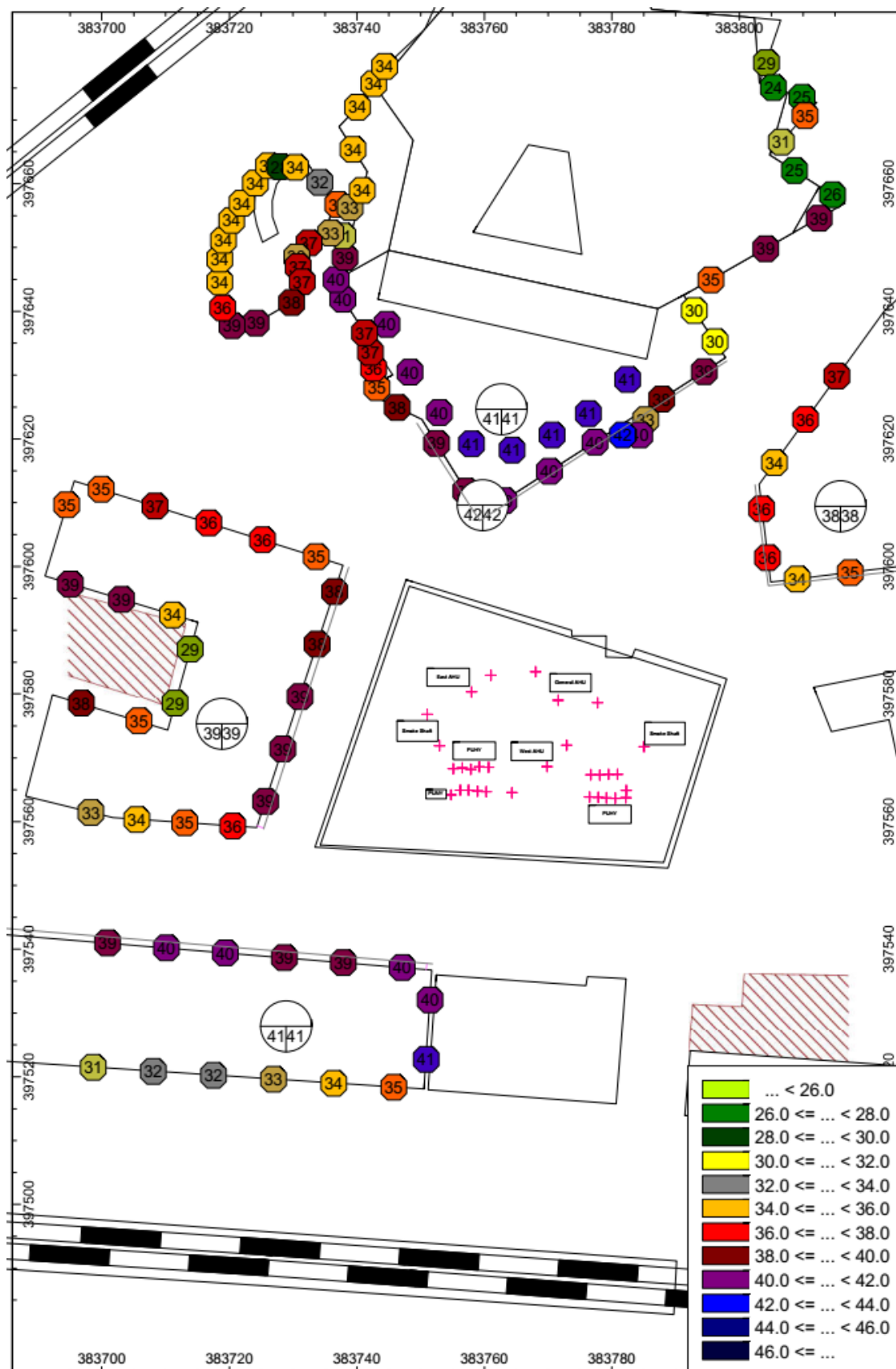
4.4 The assumptions used in the model include:

- Mapping Information from Google Maps, with topographic data via light detection and ranging (LIDAR), and proposed rooftop plan layout drawings;
- Surfaces absorption characteristics have been set as $\alpha = 0.05$;
- Two (2) number of orders for reflection;
- To reflect the local ground cover, ground absorption was set to $G = 0.5$ (50% acoustically reflective ground);
- The site layout plan was incorporated into the noise model in order to account for screening;
- There is a 1500mm parapet proposed at the perimeter of the roof, as per discussions and from the design team; and
- The receptor points have been modelled at the height of the nearest facades to the proposed plant.

4.5 The resultant levels at the façades of the NSRs are shown in **Figure 4.1**.

² BS EN ISO 9613-2 - Attenuation of sound during propagation outdoors – Part 2: General method of calculation, GB

Figure 0.1: Noise Contour of Noise Levels at NSRs (dB, $L_{Aeq,T}$) 1.5m grid Height



- 4.6 The assessment has been completed for a worst-case scenario in that it has been assumed all plant would be operating simultaneously and at full-duty (i.e., 100% on-time and capacity) during the quietest daytime periods without mitigation. It should be noted that a night-time assessment has not been undertaken as it is understood that the plant equipment is not expected to operate during the night-time period. The assessment summary of specific noise levels at the NSRs is shown in **Table 4.2**.
- 4.7 In the context of the existing noise climate and limiting criteria, and the plant units presenting no tonal noise elements, an acoustic penalty correction has not been applied.

Table 0.2: Summary of Assessed Specific Noise Levels at the NSR – No Mitigation, dB

Assessment Parameter	NSR 1 (Daytime Period)	NSR 2 (Daytime Period)	NSR 3 (Daytime Period)	NSR 4 (Daytime Period)	Relevant BS 4142 Clause
Specific sound level at NSR ($L_{Aeq,T}$)	42	38	39	41	7.3.5
Acoustic feature correction	0 ¹	0 ¹	0 ¹	0 ¹	9.2
Rating Level ($L_{A,r,T}$)	42	38	39	41	9.2
Background sound level, dB $L_{A90,1hr}$	49	49	49	49	8
Rating Level above Background Sound level, dB	-7	-11	-10	-8	
BS 4142 Impact	Low Impact	Low Impact	Low Impact	Low Impact	-
Meets Adopted MCC criteria? (-5dB)	Yes	Yes	Yes	Yes	-
Notes: * Calculation based upon modelling, which takes into consideration any short and long-distance attenuation, and site-specific screening attenuation. Assessment based on the typical representative measured $L_{A90,1hr}$ levels whilst source data derived from source noise levels stipulated in supplier/manufacturers data sheet. 1 Based on previous experience of the type of speed-controlled plant utilised on similar schemes, it is known that they emit noise that is broadband in nature and therefore no acoustic feature correction/penalty has been applied.					

- 4.8 From a review of **Table 4.2**, it can be seen that, for a worst case scenario, a cumulative plant rating noise level of 42 dB $L_{A,r,T}$ is predicted during the daytime periods at NSR1 and 41 dB $L_{A,r,T}$ is predicted NSR4. The plant noise level is -7 and -8 dB below the daytime criteria. The assessment therefore demonstrates a 'low impact' in accordance with BS 4142, MCC requires that the rating level at the NSR be -5dB. The assessment also therefore highlights that this criterion is achieved in accordance with MCC's Planning and Noise Technical Guidance document.
- 4.9 Given that the assessment demonstrates compliance with Condition 13 without the requirement for further mitigatory measures. As such, it is considered that there is sufficient information provided to allow the partial discharge of Planning Conditions 13, pending submission of the completion reports.

5 Conclusion

- 5.1 An assessment of external fixed building services plant noise associated with the proposed development has been undertaken to support the partial discharge of Planning Condition 13 associated with planning permission (application ref: 129081/FO/2021) for the redevelopment of 70 Great Bridgewater Street, Manchester.
- 5.2 The results of the assessment predict that noise from fixed building services plant is below the adopted criteria, without the requirement for further mitigatory measures. Based on the information provided in this technical note, it is considered that there is sufficient information provided to allow the partial discharge of Planning Conditions 13, pending submission of the completion test reports to fully discharge the Planning Conditions.

We trust the content of this Technical Note to be clear and of assistance at this stage. Should you wish to discuss any aspect in further detail, please do not hesitate to contact us and we will be happy to help.

For and On Behalf of BWB Consulting Limited