

## Design note.

To: Liz Black

Cc: Mark Pallett

From: Al Plail, Senior Acoustics Engineer

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Project: GMP SOCH Building

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## External plant noise commissioning.

Acoustic commissioning measurements were undertaken at the new Greater Manchester Police SOCH building, Openshaw on 27 November 2020 to assess noise emissions from rooftop plant. Details of the measurements and assessment of noise egress levels to the nearby sensitive premises are provided below.

The commissioning measurements and subsequent assessment demonstrate compliance with the relevant Planning Conditions.

### 1. Criteria.

#### 1.1 Planning conditions.

Condition 12 is provided below for reference.

12) (a) prior to the first use of the development, details of any externally mounted ancillary plant, equipment and servicing shall be submitted for approval. (b) The approved scheme shall be implemented and prior to the first use of the development and post construction survey (including appropriate mitigation measures and timescales for implementation if necessary) shall be submitted for approval in writing by the City Council, as Local Planning Authority. The measures agreed thereafter retained and maintained in situ.

Reason - To minimise the impact of plant on the occupants of the development pursuant to policies SP1 and DM1 of the Manchester Core Strategy (2012) and saved policy DC26 of the Unitary Development Plan for the City of Manchester (1995).

#### 1.2 Plant noise limits.

An environmental noise survey and noise impact assessment was undertaken by Peter Brett Associates (PBA) in January 2018, as detailed in the report *43251\_NIA\_19012018\_DT\_MM\_ER*.

In accordance with the above Planning Condition and findings of the PBA report, the overall maximum sound pressure levels for the newly installed plant should not exceed the levels presented in Table 1 at the nearest dwellings on Railway Street.

Table 1 Maximum permissible sound pressure levels at the nearest noise sensitive premises

| Time of day          | Maximum sound pressure level at the nearest noise sensitive premises ( $L_{Aeq}$ , dB) |
|----------------------|----------------------------------------------------------------------------------------|
| 07:00 to 23:00 hours | 46                                                                                     |
| 23:00 to 07:00 hours | 38                                                                                     |

## 2. Commissioning measurements.

### 2.1 Proposed plant.

The following noise generating plant has been installed to the roof of the building:

- 1x AHU
- 2x supply fans
- 2x extract fans
- 5x condenser units.

### 2.2 Measurement results.

A sample of noise measurements were undertaken in the vicinity of the rooftop plant to establish the level of noise emissions from each unit.

For each item of plant, measurements were carried out while it was understood be operating at design duty, then repeated with all units switched off. This allows for the plant noise levels to be corrected for background noise, which was generally driven by distant traffic and general industrial noise from the surrounding area. Further details of the measurements and equipment used are provided in Appendix A.

A summary of the noise levels measured are provided in Table 2.

Table 2 Noise measurements of plant room emissions

|                                                         | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | $L_{Aeq}$ |
|---------------------------------------------------------|------|-------|-------|-------|------|------|------|------|-----------|
| <i>Air Handling Unit</i>                                |      |       |       |       |      |      |      |      |           |
| Unit ON (measured at 3 m from atmospheric terminations) | 65   | 67    | 67    | 62    | 61   | 58   | 53   | 47   | 65        |
| Unit OFF                                                | 67   | 56    | 51    | 47    | 43   | 37   | 27   | 17   | 49        |
| Corrected noise contributions due to AHU, 3 m           | 61   | 67    | 67    | 62    | 61   | 58   | 53   | 47   | 65        |
| <i>Supply fans (x2 units operating simultaneously)</i>  |      |       |       |       |      |      |      |      |           |
| Fans ON (measured at 3 m from atmospheric terminations) | 61   | 68    | 52    | 47    | 44   | 41   | 34   | 26   | 54        |
| Fans OFF                                                | 61   | 57    | 49    | 42    | 42   | 34   | 26   | 20   | 47        |
| Corrected noise contributions due to supply fans, 3 m   | 44   | 67    | 49    | 46    | 39   | 39   | 33   | 25   | 53        |

|                                                         | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | L <sub>Aeq</sub> |
|---------------------------------------------------------|------|-------|-------|-------|------|------|------|------|------------------|
| <i>Extract fans (x2 units operating simultaneously)</i> |      |       |       |       |      |      |      |      |                  |
| Fans ON (measured at 3 m from atmospheric terminations) | 70   | 66    | 68    | 58    | 62   | 55   | 50   | 43   | 65               |
| Fans OFF                                                | 63   | 57    | 54    | 47    | 47   | 41   | 33   | 27   | 51               |
| Corrected noise contributions due to extract fans, 3 m  | 69   | 65    | 68    | 57    | 62   | 55   | 50   | 43   | 65               |
| <i>Condensers (x5 units operating simultaneously)</i>   |      |       |       |       |      |      |      |      |                  |
| All units ON (measured at 3 m from units)               | 61   | 56    | 52    | 50    | 46   | 41   | 36   | 31   | 52               |
| All units OFF (measured at 3 m from units)              | 61   | 57    | 49    | 42    | 42   | 34   | 26   | 20   | 47               |
| Corrected noise contributions due to condensers, 3 m    | 56   | 48    | 50    | 50    | 45   | 40   | 35   | 31   | 50               |

### 2.3 Assessment.

The calculations have been based on continuous operation of the proposed items during the day and night. Appropriate distance and screening corrections have been taken based on the relative locations of the plant and commissioning measurement position in relation to the nearest residential dwelling. This considers the following:

- The rooftop plant area is approximately 300 m from the nearest dwelling on Railway St
- All units do not have a direct line of sight to the dwelling due to the relative heights of the buildings and parapet at the end of the roof.

Based on the measured noise levels and distance / screening corrections, the predicted noise levels at the worst affected dwelling on Railway St are set out in Table 3.

**Table 3** Calculated noise levels at the nearest dwellings

|                          | Calculated plant noise levels at nearest dwellings |           |           |           |           |           |          |          |                  |
|--------------------------|----------------------------------------------------|-----------|-----------|-----------|-----------|-----------|----------|----------|------------------|
|                          | 63Hz                                               | 125Hz     | 250Hz     | 500Hz     | 1kHz      | 2kHz      | 4kHz     | 8kHz     | L <sub>Aeq</sub> |
| AHU                      | 13                                                 | 19        | 19        | 14        | 12        | 10        | 5        | -1       | 17               |
| Supply fans              | 21                                                 | 17        | 19        | 9         | 14        | 7         | 2        | -5       | 17               |
| Extract fans             | -4                                                 | 19        | 0         | -2        | -9        | -9        | -15      | -23      | 5                |
| Condensers               | 8                                                  | 0         | 1         | 1         | -3        | -8        | -13      | -17      | 2                |
| <b>Total noise level</b> | <b>22</b>                                          | <b>23</b> | <b>22</b> | <b>15</b> | <b>16</b> | <b>12</b> | <b>7</b> | <b>0</b> | <b>20</b>        |

The calculated noise levels are compliant with the criteria set out in Section 1.

## Appendix A - Measurement & equipment details.

### Measurements.

Attended noise measurements were carried out in the vicinity of the new plant on 27 November 2020.

Measurements were conducted over 3x 30 second periods per measurement with a RION NL-52 sound level meter (SLM). The SLM was mounted approximately 1.2 m above ground level and at least 3 m from any other reflective surface. The microphone of the SLM was fitted with a windshield. The meter was calibrated before and after the survey and no significant drift was noted.



### Equipment details.

Table B1 summarises the details of the equipment used during the environmental noise survey. All equipment used was within dates of calibration and calibration certificates are available on request.

**Table B1 Equipment used during environmental noise survey**

| Item              | Description                                                                                | Serial Number              | Calibration Date |
|-------------------|--------------------------------------------------------------------------------------------|----------------------------|------------------|
| Sound Level Meter | Rion - Sound Level Meter: NL-52<br>Rion - Microphone: UC-59<br>Rion - Pre-amplifier: NH-25 | 00297868<br>14887<br>88079 | 08/04/2019       |