

**ENVIRONMENT**

Trammell Crow Company

Heywood Store Site,  
Heywood

**Noise Impact Assessment**

220785

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Heywood Store Site,  
Heywood

## **Noise Impact Assessment**

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## **EXECUTIVE SUMMARY**

BWB Consulting has been instructed by Trammell Crow Company to undertake a Noise Impact Assessment to support a planning application for a proposed new storage and distribution facility, known as the Heywood Stores site, on the site of a current storage facility, off Manchester Road in Heywood, Greater Manchester.

The main noise sources associated with the proposed development are expected to be HGVs and fixed external plant items.

This assessment presents the results of a baseline noise survey undertaken in the vicinity of the closest noise sensitive receptors to the site, predicts the likely noise emissions from the loading and unloading of HGVs, HGV movements to and from the site, and determines suitable noise limits for any fixed plant which will be installed as part of the scheme (details for which are currently unknown).

Noise emissions from HGV activity at the site have been assessed during daytime and night-time periods in accordance with the methodology outlined in BS 4142, and a potentially adverse impact has been predicted at the nearest existing receptors and at some adjacent land parcels which have approval for residential development.

Mitigation, in the form of acoustic barriers, has therefore been recommended to be incorporated into the proposed development.

As the details of proposed fixed plant items associated with the site are not known at this stage, noise level limits have been proposed at nearby sensitive locations based on the guidance within BS 4142. Provided these noise level limits are achieved a low impact would be predicted from the fixed plant items.

Given the results of this assessment, it is considered that noise need not be a determining factor in granting planning permission for the proposed development.

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## 1. INTRODUCTION

### Appointment & Background

- 1.1 BWB Consulting (BWB) has been instructed by Trammell Crow Company to undertake a Noise Impact Assessment to support a planning application for a proposed storage and distribution facility, known as the Heywood Stores site, off Manchester Road in Heywood, Greater Manchester.
- 1.2 The assessment draws on the results of a baseline noise survey undertaken in the vicinity of the site and has been undertaken in accordance with relevant British Standards and guidance relating to noise.
- 1.3 This report is necessarily technical in nature, so to assist the reader, a glossary of acoustic terminology can be found in **Appendix A**.

### Site Location and Layout

- 1.4 The development site is currently occupied by nine warehouse buildings and is used by the Department for Work and Pensions (DWP) as a storage facility. The site currently operates under a B8 consent since a certificate of lawful use of the site for its current use was issued in December 2018.
- 1.5 The site is located to the west of Manchester Road, just to the north of its junction with Hareshill Road. The site's north-eastern boundary is adjacent to the playing fields of Newhouse Academy. The site's eastern boundary is adjacent to dwellings off Oldbury Close, Whitehouse Close and Badger Drive. The southern site boundary is adjacent to a strip of land which is currently being developed as a new link road between J19 of the M62 and Pilsbury Road.
- 1.6 The southwest and northwest boundaries of the site are adjacent to open land, which is currently undeveloped, but which is within the red line boundary of the South Heywood masterplan application (planning ref:16/01399/HYBR). This application includes the construction of a new link road approximately 20m away from, and parallel to, the southern boundary of the site, acoustic barriers at various locations along the length of the new road and also includes residential development on the parcels of land around the western site corner.
- 1.7 The site location is shown in **Figure 1.1**.

### Proposed Development

- 1.8 The proposed development comprises three warehouse units spread across two structurally separate buildings, the largest of which will have a floor area of 35.1k m<sup>2</sup> and will have 44 HGV delivery bays on the northwest façade. The smaller building will have a floor area of 10.2k m<sup>2</sup> and will be split in half to operate as two units, each with 6 HGV delivery bays at opposite ends of the building.
- 1.9 The proposed development layout is shown in **Figure 1.2**.

**Figure 1.1: Site Location**



**RECYCLED GLASS TILES REQUIRED ALONG THIS FENCE**

**TURNING CIRCLES 20m**

**SPRINKLER TANKS AND PUMPHOUSE**

**SUB-STATION (Pole)**

**8m HIGH ACOUSTIC FENCE WITH GREEN WALL IN EXTERNAL FAGE NORTH END GRADUALLY SLOPING DOWN**

**RAISED AREA FROM YARD LEVEL TO BUILDING LEVEL**

**35 TRAILER PARKING SPACES IN SERVICE YARD**

**8m HIGH ACOUSTIC FENCE**

**WING SPACES AND 10 DISABLED-BICYCLE SPACES 3.5 SPACES**

**2nd BATTERY ENERGY STORAGE SYSTEM METAL CONTAINER 12.2x2.8x4m COLOUR WOOD GREEN RAL 6005**

**CYCLE SHELTER AND SPACES**

**STAIRCASE ACCESS TO BUILDING VIA BRIDGE**

**PEDESTRIAN BRIDGE FOR ACCESS TO OFFICES FROM CAR PARK**

**2nd LEVEL ACCESS DOORS**

**3rd LEVEL ACCESS DOORS**

**4th LEVEL ACCESS DOORS**

**5th LEVEL ACCESS DOORS**

**6th LEVEL ACCESS DOORS**

**7th LEVEL ACCESS DOORS**

**8th LEVEL ACCESS DOORS**

**9th LEVEL ACCESS DOORS**

**10th LEVEL ACCESS DOORS**

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## 2. STANDARDS AND GUIDANCE

### National Planning policy Framework (NPPF)

- 2.1 Published in 2012, and most recently revised in July 2021, this document sets out the Government's planning policies for England. It makes the following reference to noise in the section entitled Conserving and enhancing the natural environment:

"174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

[...]

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans."

- 2.2 It also makes the following references to noise in the Section entitled *Ground conditions and pollution*:

"185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life<sup>60</sup>;
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

<sup>60</sup> See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010)."

### British Standard 4142: 2014+A1:2019: Methods For Rating And Assessing Industrial And Commercial Sound (BS 4142)

- 2.3 This British 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.
- 2.4 The method uses 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.
- 2.5 In accordance with the assessment methodology, the specific sound level ( $L_{Aeq,T}$ ) of the noise source being assessed is corrected by the application of penalties for characteristic features, such as tonal qualities and/or distinct impulses, to give a rating level ( $L_{A,r,T}$ ). The British Standard effectively compares the difference between the rating level and the typical background sound level ( $L_{A90,T}$ ) in the absence of the noise source being assessed.
- 2.6 It is advised 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) when the noise source in question is likely to operate or is proposed to operate in the future.
- 2.7 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."*

### **Rochdale's Core Strategy**

- 2.8 Rochdale borough's core strategy was adopted on 19 October 2016. It's the lead document in the Local Plan.
- 2.9 This strategic document sets out planning policies for Rochdale to guide the quality of the built environment, which is used to inform decisions on planning applications. Noise is addressed within Policy G9 'Reducing the impact of pollution, contamination and land instability' under Section 10 of the document, stating in general;

*"We will reduce all forms of pollution, contamination, and land instability in the borough, by:*

---

*(b) Requiring that development does not have impacts that lead to an unacceptable increase in air, water, noise, light, or other pollution"*

### 3. BASELINE NOISE SURVEY

- 3.1 A baseline noise survey has been undertaken to determine the prevailing noise climate at locations representative of the closest noise sensitive receptors to the site. Baseline noise monitoring was undertaken at two measurement locations, as shown in **Figure 3.1**, which are considered to be representative of the closest dwellings (both existing and proposed) to the north, south and east of the site.

**Figure 3.1: Baseline Noise Survey Measurement Location**



#### Measurement Location 1

- 3.2 Noise monitoring was undertaken at Measurement Location 1 (ML1) over a four-day period commencing at 12:30 on Thursday 19<sup>th</sup> May 2022. The microphone was in free-field conditions approximately 2 m above local ground level.
- 3.3 ML1 was selected to be representative of the prevailing noise climate at the nearest noise sensitive locations to the southern boundary of the site (i.e., dwellings off Hareshill Road). The noise climate at ML1 was noted to be dominated by local road traffic noise from vehicles on Manchester Road, and traffic on the M62 motorway 100 m to the southeast.

- 3.4 The locations for which ML1 is considered to be representative will be subject to a change in noise levels once the new link road to the south, which is currently under construction but not yet operational, becomes operational. However the extent of this potential change has not been considered as part of this assessment, which is considered to form a worst-case assessment.

### **Measurement Location 2**

- 3.5 Noise monitoring was undertaken at Measurement Location 2 (ML2) over a four-day period commencing at 12:30 on Thursday 19<sup>th</sup> May 2022. The microphone was in free-field conditions approximately 1.5 m above local ground level.
- 3.6 ML2 was selected to be representative of the prevailing noise climate at the nearest noise sensitive locations to the eastern boundary of the site, which are (and will continue to be) largely screened from the main local traffic routes. Namely, these are dwellings off Oldbury Close, Whitehouse Close and Badger Drive, and the land to the northwest of the site which has planning approval for residential development. The noise climate at ML2 was dominated by natural sounds and distant road traffic.

### **Measurement Equipment**

- 3.7 The baseline noise survey was undertaken using the Class 1 specification noise measurement equipment detailed in **Table 3.1**. The equipment was calibrated using a portable calibrator immediately before and after the measurements with no significant drift in calibration observed. The sound level meter, pre-amplifier and microphone were calibrated to traceable standards within the 24-months prior to the measurements. The portable calibrator was calibrated within the 12-months preceding the date of the survey.

**Table 3.1: Noise Measurement Equipment**

| Location  | Equipment         | Make and Model | Serial Number | Calibration Due Date |
|-----------|-------------------|----------------|---------------|----------------------|
| ML1       | Sound Level Meter | SVAN 971       | 80342         | 27/08/2022           |
|           | Microphone        | ACO 7052E      | 71683         |                      |
|           | Pre-amplifier     | SV18           | 71576         |                      |
| ML2       | Sound Level Meter | 01 dB Fusion   | 12079         | 11/02/2023           |
|           | Microphone        | Grass 40DC     | 331890        |                      |
|           | Pre-amplifier     | 01 dB PRE 22   | 171082        |                      |
| ML1 & ML2 | Calibrator        | B&K DB0311     | 449050        | 19/08/2022           |

### **Weather Conditions**

- 3.8 The weather during the noise survey was conducive to environmental noise measurement, it being dry with negligible winds (<5 ms<sup>-1</sup>).

## Measurement Results

- 3.9 A summary of the sound pressure levels measured during daytime and night-time periods is included in **Table 3.2**. Full measurement results are presented in **Appendix B**.

**Table 3.2: Summary of Measured Sound Pressure Levels at ML1**

| Start Date                                                                                   | Period                     | ML1                   |                                    | ML2                   |                                    |
|----------------------------------------------------------------------------------------------|----------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|
|                                                                                              |                            | dB L <sub>Aeq,T</sub> | dB L <sub>A90,T</sub> <sup>2</sup> | dB L <sub>Aeq,T</sub> | dB L <sub>A90,T</sub> <sup>2</sup> |
| Thursday 19 <sup>th</sup>                                                                    | Night-time (23:00 – 07:00) | 54                    | <b>46</b>                          | 49                    | <b>40</b>                          |
| Friday 20 <sup>th</sup>                                                                      | Daytime (12:30 – 23:00)    | 57                    | 54                                 | 51                    | 46                                 |
|                                                                                              | Night-time (23:00 – 07:00) | 55                    | 48                                 | 49                    | 43                                 |
| Saturday 21 <sup>st</sup>                                                                    | Daytime (07:30 – 23:00)    | 53                    | <b>50</b>                          | 48                    | <b>42</b>                          |
|                                                                                              | Night-time (23:00 – 07:00) | 52                    | 48                                 | 52                    | 41                                 |
| Sunday 22 <sup>nd</sup>                                                                      | Daytime (12:30 – 23:00)    | 56                    | 53                                 | 50                    | 44                                 |
|                                                                                              | Night-time (23:00 – 07:00) | 56                    | 49                                 | 54                    | 42                                 |
| Monday 23 <sup>rd</sup>                                                                      | Daytime (12:30 – 23:00)    | 55                    | 50                                 | 51                    | 44                                 |
| <sup>2</sup> Taken to be the mean average L <sub>A90,15min</sub> value during survey period. |                            |                       |                                    |                       |                                    |

## 4. ASSESSMENT

- 4.1 At this stage of the scheme design it is reasonable to assume that the main noise sources associated with the operation of the site will be HGV movements to and from delivery bays, noise from the delivery bays during loading and unloading, and noise emissions from fixed plant items serving the buildings. These likely noise sources are discussed in further detail below.

### Noise From HGVs

- 4.2 The assessment of noise emissions from HGVs making deliveries to and from the units has been based on noise data measured at a similar site.
- 4.3 It is assumed that HGVs will arrive at the site via the access point on Manchester Road, where HGVs visiting Unit 1 will immediately turn right into Unit 1's delivery yard, and all other HGVs will turn left and travel on the access road parallel to the site boundary to either Unit 2 or Unit 3. Once in the respective delivery yards, the HGVs will each travel to a loading bay, manoeuvre, reverse into a delivery bay, unloading/loading for 30mins (with no engine idling), and then drive away via the same route. The noise source data for these activities, which has been used in this assessment, is shown in **Table 4.1**.

**Table 4.1: Noise Source Data Adopted for Assessment of HGV Movements**

| Activity               | Duration | dB, LAeq at 10 m | dB, SEL at 10m |
|------------------------|----------|------------------|----------------|
| HGV Pass-by            | 00:00:25 | 64               | 78             |
| HGV Reversing into bay | 00:00:54 | 61               | 78             |
| HGV Loading/unloading  | 00:05:00 | 54               | 79             |
| HGV pulling away       | 00:00:12 | 66               | 77             |

- 4.4 It has been assumed that during a worst case (busiest) 1-hour period during the daytime and night-time, 50% of the delivery bays at each unit would be used, and the assessment has therefore assumed that 28 HGVs will arrive at the site and 28 HGVs will leave the site, all of which will be evenly spaced throughout the hour.
- 4.5 The location and layout of the proposed site buildings will result in a significant degree of acoustic screening being provided between the on-site vehicle movements and the nearest noise sensitive locations (both existing and proposed). This will vary significantly however between receptors, and so to account for these differences, an assessment has been undertaken at 5 separate locations which are considered representative of the worst affected receptors. These assessment locations are shown in **Figure 3.1**.
- 4.6 To predict the noise emissions from HGVs using the site, a digital noise model of the site has been developed using modelling software CadnaA®. The following assumptions and calculation parameters have been adopted in the development of the model:
- First order reflections have been considered;
  - Buildings and barriers are assumed to be acoustically reflective;
  - To reflect local ground cover, ground absorption was set to G=0 (100% hard, reflective ground);

- The proposed Site layout is based on Ashton Smith's 'Proposed Site Layout (Rev P4)' drawing dated 11/07/22;
  - Predicted daytime noise levels at ground floor level have been calculated at a height of 1.5 m above local ground level;
  - Predicted daytime and night-time noise levels at first floor level have been calculated at a height of 3.5m above local ground level; and
  - All predicted noise levels should be assumed to be free-field unless stated otherwise.
- 4.7 Locations AL2 and AL5 represent the closest unscreened locations to the site with residential planning permission. Although residential development is permitted in these areas up to the boundary, no detailed layout plans have been available during the preparation of this report. For the purposes of this assessment, it has been assumed that any dwellings will be set back from the site boundary by 15 m or more.
- 4.8 Using the source data shown in **Table 4.1** and the assumptions stated above, the predicted noise levels due to HGV movements at the site during a worst-case daytime hour/night-time 15-minute period are shown in **Table 4.2**.
- 4.9 Given the nature of the noise from HGV deliveries it is not appropriate to apply penalties for tonality, intermittency or impulsivity when determining a rating noise level in accordance with BS 4142. However, it is recognised that the noise from HGV deliveries may be readily distinctive against the residual acoustic environment and a penalty of 3 dB is appropriate to apply in accordance with guidance from BS 4142. The derived rating levels are also shown in **Table 4.2** together within the difference between the rating level and the representative background noise level at each location.

**Table 4.2: Predicted Noise Levels from HGV movements**

| Assessment Location | Predicted Specific Noise Level (dB L <sub>Aeq,T</sub> ) | Predicted Rating Level (dB L <sub>Ar,T</sub> ) | Background (day/night) (dB L <sub>A90,T</sub> ) | Difference (day/night) |
|---------------------|---------------------------------------------------------|------------------------------------------------|-------------------------------------------------|------------------------|
| AL1                 | 39                                                      | 42                                             | 50 / 46                                         | -8 / -4                |
| AL2                 | 48                                                      | 51                                             | 42 / 40                                         | +9 / +11               |
| AL3                 | 25                                                      | 28                                             | 42 / 40                                         | -14 / -12              |
| AL4                 | 42                                                      | 45                                             | 42 / 40                                         | +3 / +5                |
| AL5                 | 55                                                      | 58                                             | 50 / 46                                         | +8 / +12               |

- 4.10 At AL1 and AL3 the predicted noise rating levels from HGV movements on the site are 8 dB and 10 dB below the background noise levels during the daytime, and 4 dB and 12 dB below the background sound level during the night-time. Therefore, a low impact would be predicted in accordance with BS 4142 for both daytime and night-time periods at this location, and no mitigation is warranted.
- 4.11 Comparing the predicted rating levels against the measured background sound levels at AL2, AL4 and AL5, the rating levels are predicted to be between 3 dB and 12 dB above the background during the daytime, and between 5 dB and 12 dB above the background sound level during the night-time. Therefore, an adverse impact would be predicted in accordance with BS 4142 for both daytime and night-time periods, and additional mitigation will therefore be required to reduce this potential impact.

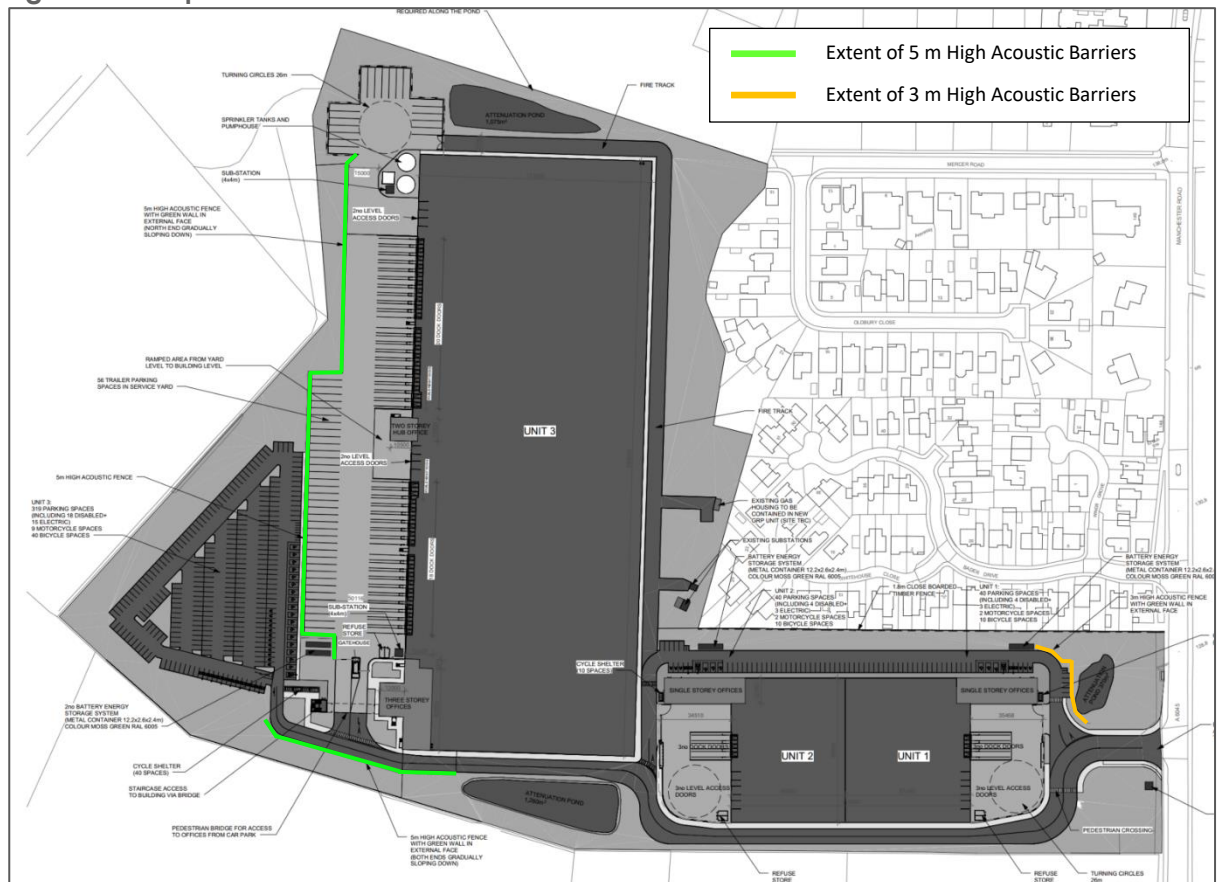
## Noise from Fixed Plant items

- 4.12 It is anticipated that there may be fixed plant and equipment associated with the proposed development that may have the potential to generate noise. At this stage however, the exact details of any proposed plant items are not known. In the absence of detailed information, it is appropriate to specify suitable noise level limits to which any proposed plant should conform. These limits should include any appropriate corrections for acoustic characteristics.
- 4.13 It is considered appropriate that the cumulative effect of all external plant and noise breakout from the development should be controlled so that the rating level is no greater than lowest background sound levels ( $L_{A90}$ ) from **Table 3.2** at the nearest noise sensitive locations, namely:
- A rating level limit of 50 dB during the daytime and 46 dB during the night-time at the nearest noise sensitive receptors to the south and southwest of the site; and
  - A rating level limit of 42 dB during the daytime and 40 dB during the night-time at the nearest noise sensitive receptors to the north and east of the site.
- 4.14 Achieving a rating level equal to or less than the prevailing background sound level indicates a low impact in accordance with BS 4142. Therefore, provided the limits are achieved, a low impact would be anticipated.
- 4.15 In accordance with BS 4142, assessments of plant noise emissions should include appropriate rating corrections for tonal, irregular, or intermittent plant where applicable, before comparison with the above limits.
- 4.16 It should be noted that the derived rating level limits would be applicable to the total noise from the simultaneous operation of all external plant serving the proposed development. As such, noise emissions from individual items of plant will need to be lower than the given limits, although the exact limit for each individual item of plant will be dependent upon its type, noise characteristics, location etc. This issue is best addressed during the detailed design stage.

## 5. MITIGATION

- 5.1 As identified in **Table 4.2** and paragraph 4.11 of this report, noise from HGV movements and loading / unloading operations at the proposed site is predicted to result in an adverse impact at the areas adjacent to the site where residential development is permitted, and at some existing noise sensitive locations adjacent to the site.
- 5.2 Notwithstanding the details (layouts, and exact locations of dwellings etc) of the permitted development(s), which are not known at this time, mitigation measures are likely required as part of the proposed development to ensure that noise emissions from HGVs and loading/unloading activities can be suitably controlled.
- 5.3 It is recommended that allowance is made as part of the proposed development for acoustic barriers of between 3 m and 5 m in height. The recommended placement and height of these barriers is shown in **Figure 5.1**.

**Figure 5.1: Proposed Acoustic Barrier Locations**



- 5.4 With the recommended acoustic barriers in place, the predicted noise levels due to HGV movements at the site during a worst-case daytime hour/night-time 15-minute period are shown in **Table 5.1**.

**Table 5.1: Predicted Noise Levels from HGV movements with Mitigation**

| Assessment Location | Predicted Specific Noise Level (dB L <sub>Aeq,T</sub> ) | Predicted Rating Level (dB L <sub>A,r,T</sub> ) | Background (day/night) (dB L <sub>A90,T</sub> ) | Difference (day/night) |
|---------------------|---------------------------------------------------------|-------------------------------------------------|-------------------------------------------------|------------------------|
| AL1                 | 38                                                      | 41                                              | 50 / 46                                         | -9 / -5                |
| AL2                 | 37                                                      | 40                                              | 42 / 40                                         | -2 / 0                 |
| AL3                 | 23                                                      | 26                                              | 42 / 40                                         | -16 / -14              |
| AL4                 | 34                                                      | 37                                              | 42 / 40                                         | -5 / -3                |
| AL5                 | 41                                                      | 44                                              | 50 / 46                                         | -6 / -2                |

- 5.5 The results in **Table 5.1** demonstrate that with the mitigation in place, rating levels are predicted to be no greater than the respective background sound levels during daytime and night-time periods at the assessment locations. Therefore, a low impact would be predicted in accordance with BS 4142 for both daytime and night-time periods at these locations.
- 5.6 To perform effectively, all the proposed acoustic barriers at the site should be continuous along their length, imperforate, sealed at their base with the ground and have a minimum mass of 15 kg/m<sup>2</sup>. The barriers shall be installed such that the top height of the barrier is at the appropriate height (i.e., 3 m or 5 m depending on the location) relative to the ground level in the delivery yard of the relevant unit.
- 5.7 It is understood that the proposed acoustic barrier which runs adjacent to the south of the access road will consist of a 4m high retaining wall with a 1.1m high acoustic fence on the top.
- 5.8 Prior to the acoustic barrier design being finalised, it is also recommended that consideration be given to any new information which may be forthcoming regarding the proposed layouts of the adjacent residential sites, particularly building heights and set back distances from the boundaries.

## **6. CONCLUSION**

- 6.1 BWB Consulting (BWB) has been instructed by Trammell Crow Company to undertake a Noise Impact Assessment to support a planning application for a proposed warehousing facility on a site off Manchester Road in Heywood.
- 6.2 This report presents an assessment of the potential noise impacts of HGV movements associated with the proposed development at nearby noise sensitive receptors and draws upon the results of a baseline noise survey. This assessment has been undertaken with due consideration to relevant British Standards and guidance relating to noise.
- 6.3 Noise emissions from HGV deliveries to and from the site have been assessed at the worst affected nearby noise sensitive receptors during daytime and night-time periods in accordance with methodology from BS 4124. A low impact has been predicted at existing receptors, and a potentially adverse impact has been predicted at the adjacent land which has approval for residential development.
- 6.4 Mitigation has therefore been recommended in the form of acoustic barriers, which should be incorporated into the proposed development. With the proposed mitigation measures in place, a low impact has been predicted at all nearby noise sensitive receptors.
- 6.5 As the details of proposed fixed plant items associated with the site are not known at this stage, noise level limits have been proposed at nearby sensitive locations based on the guidance within BS 4142. Provided these noise level limits are achieved a low impact would be predicted from the fixed plant items.
- 6.6 Given the results of this assessment, provided the recommended mitigation is incorporated into the scheme, it is considered that noise need not be a determining factor in granting planning permission for the proposed development.

## ***APPENDICES***

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## **APPENDIX A: Glossary of Terms**

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| Term                               | Descriptions                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sound Pressure                     | Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.                                                                                                                                                                                                                                                                                          |
| Sound Pressure Level (Sound Level) | The sound level is the sound pressure relative to a standard reference pressure of 20 $\mu$ Pa (20x10 <sup>-6</sup> Pascals) on a decibel scale.                                                                                                                                                                                                                                      |
| Decibel (dB)                       | A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds S1 and S2 is given by 20 log <sub>10</sub> (S1 / S2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20 $\mu$ Pa. |
| A-weighting, dB(A)                 | The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.                                                                                                                                                                                                                                  |
| Noise Level Indices                | Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.                                                                                                       |
| L <sub>eq,T</sub>                  | A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.                                                                                                                                |
| L <sub>max,T</sub>                 | A noise level index defined as the maximum noise level during the period T. L <sub>max</sub> is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L <sub>eq</sub> noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.             |
| L <sub>90,T</sub>                  | A noise level index. The noise level exceeded for 90% of the time over the period T. L <sub>90</sub> can be considered to be the "average minimum" noise level and is often used to describe the background noise.                                                                                                                                                                    |
| Free-Field                         | Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5 m.                                                                                                                                                                                                                                                                          |
| Façade                             | At a distance of 1 m in front of a large sound reflecting object such as a building façade.                                                                                                                                                                                                                                                                                           |
| Fast/Slow Time Weighting           | Averaging times used in sound level metres.                                                                                                                                                                                                                                                                                                                                           |
| Octave Band                        | A range of frequencies whose upper limit is twice the frequency of the lower limit.                                                                                                                                                                                                                                                                                                   |

## **APPENDIX B: Full Survey Results**

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Table B-1: Noise Levels at Measurement Location 1

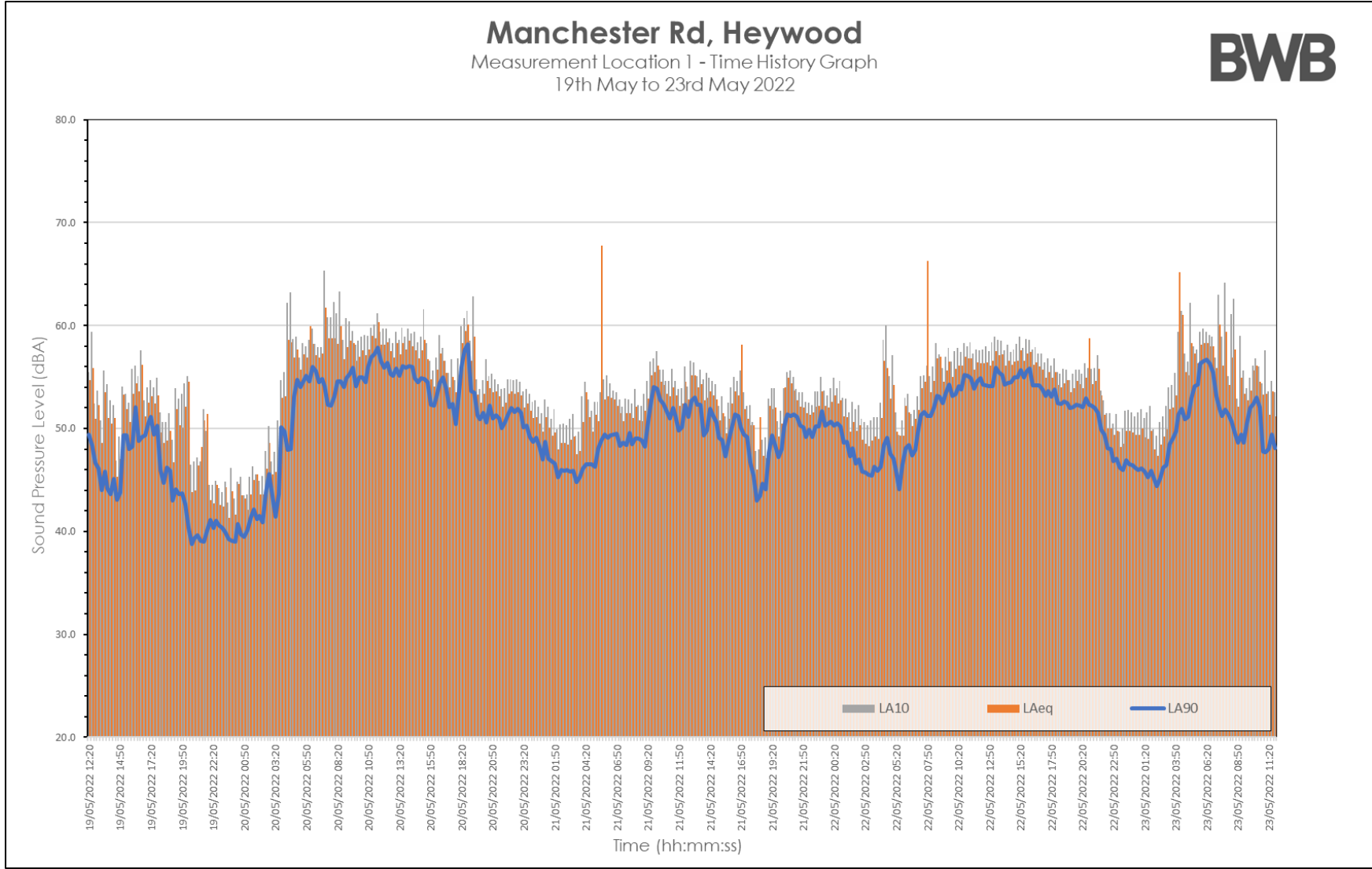
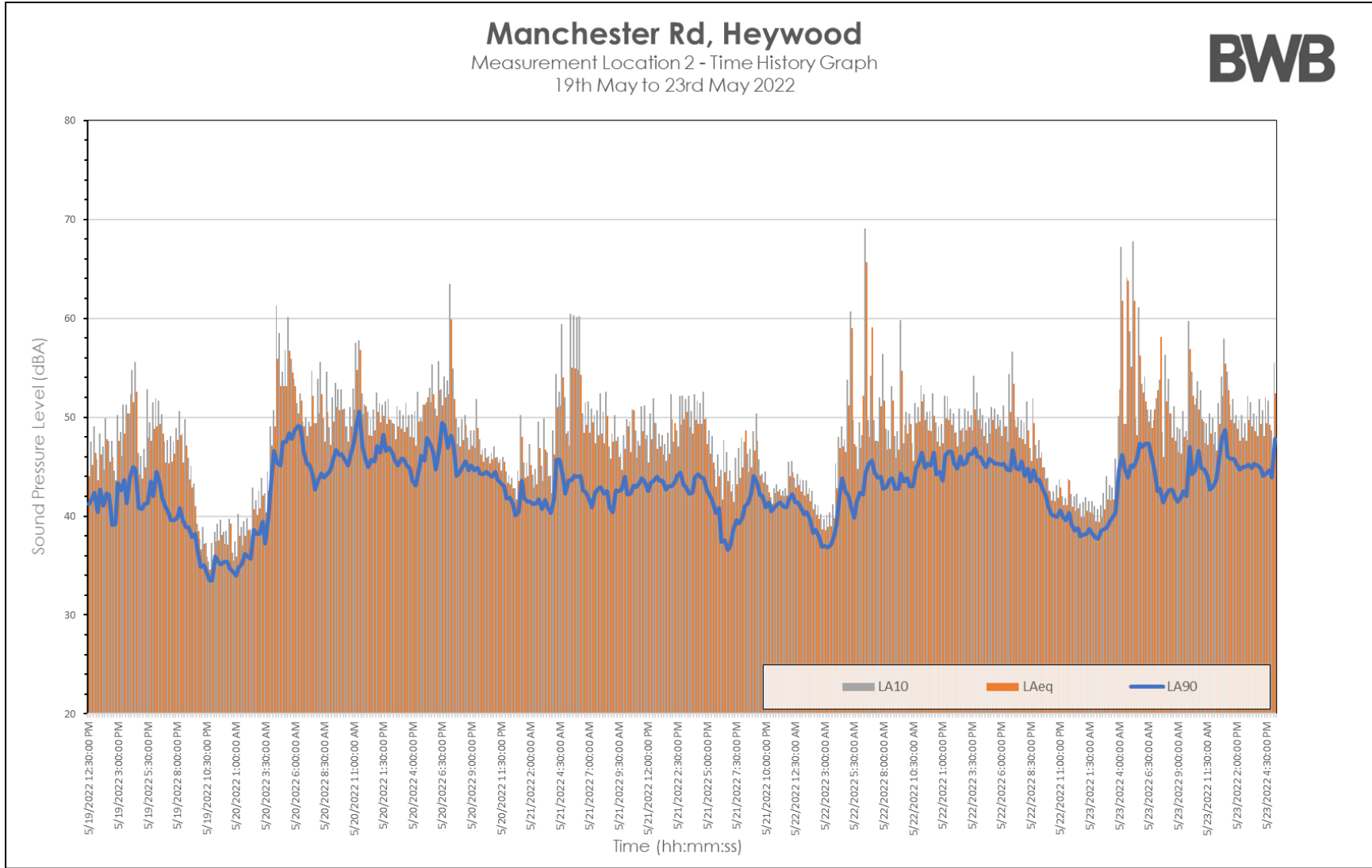


Table B-2: Noise Levels at Measurement Location 2



## **APPENDIX C: Amended Layout**

**PROPOSED SITE LAYOUT**  
1 : 1000

