

# SANDY BROWN

Consultants in Acoustics, Noise & Vibration

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**Memo:** M027-A

**Date:** 22 January 2021

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**Project:** 19233

**Pages:** 10

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**From:** Jessica Wright

**Reviewer:** James Atha

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## Lampwick, Manchester Life

### *Planning condition 14 – Noise ingress to residential*

I provide the following assessment of commercial noise breakout which can be used to discharge Planning condition 14 from application number 116190/FO/2017.

#### **Planning condition 14**

The wording of Planning condition 14 has been taken from document *Lampwick - Decision Notice\_28.07.17* reference 116190/FO/2017 and is set out below,

*‘14) Notwithstanding the noise assessment prepared by Arup stamped as received by the City Council, as Local Planning Authority, on the 5 May 2017, prior to the first occupation of the residential accommodation hereby approved, the accommodation shall be insulated in accordance with a scheme submitted for approval in writing by the City Council, as Local Planning Authority. The approved scheme shall thereafter be retained and maintained in situ for as long as the development remains in use.*

*Reason: To secure a reduction in noise from traffic or other sources in order to protect future residents from noise disturbance pursuant to policies SP1, H1 and DM1 of the Core Strategy (2007) and saved policy DC26 of the Unitary Development Plan for the City of Manchester (1995).’*

#### **External noise levels**

The external noise levels predicted at the facades of the development are set out in Table 1. The external noise levels were predicted from a 3D environmental noise model based on measured noise survey data carried out by Arup in November 2016. It is understood that the noise levels received are detailed in report 116190\_FO\_2017-NOISE\_ASSESSMENT-732968.

A summary of the predicted external noise levels is set out in Table 1. A mark-up of the elevations are presented at the end of this memo.

Table 1 Predicted external noise levels

| Facade zone                                                                         | Predicted ambient noise level, Day<br>$L_{Aeq}$ (dB) | Predicted ambient noise level, Night<br>$L_{Aeq}$ (dB) | Max noise level not normally exceeded at night, $L_{AFmax}$ (dB) |
|-------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------------|
| A  | 68-70                                                | 64-65                                                  | 80-81                                                            |
| B  | 66-67                                                | 62-63                                                  | 78-79                                                            |
| C  | 61-65                                                | 57-61                                                  | 73-77                                                            |
| D  | 55-60                                                | 51-56                                                  | 67-72                                                            |
| E  | 50-54                                                | 45-50                                                  | 61-66                                                            |

From this the facade sound insulation requirements were assessed to meet the Manchester City Council (MCC) internal noise criteria.

## Internal noise criteria

The internal noise criteria for the development have been set based on the Employer's Requirements which are in line with guidance in Manchester City Council (MCC) *Planning and Noise Technical Guidance* document dated December 2015. This also references BS 8233:2014 *Sound insulation and noise reduction for buildings*.

The maximum internal noise levels in residential areas due to noise ingress via the facade and normally operating mechanical and electrical services are set out in Table 2.

Table 2 Maximum internal ambient noise criteria

| Internal space               | Maximum internal noise level                                                                         |
|------------------------------|------------------------------------------------------------------------------------------------------|
| Bedrooms                     | Night-time (23:00-07:00) $L_{Aeq}$ 30 dB and $L_{Amax}$ 45 dB (not normally exceeded 10 to 15 times) |
| Living rooms/diners/bedrooms | Daytime (07:00-23:00) $L_{Aeq}$ 35 dB                                                                |
| Circulation spaces           | $L_{Aeq}$ 45 dB                                                                                      |

Assuming equal contribution from noise ingress via the facade and from mechanical services noise, the following noise limits for each space shall be met.

Table 3 Maximum internal noise levels based on equal contribution due to noise ingress and building services

| Internal space               | Maximum internal noise level                                                                            |                                             |
|------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------|
|                              | Noise ingress via the facade                                                                            | Mechanical services noise                   |
| Bedrooms                     | Night-time (23:00-07:00)<br>$L_{Aeq}$ 27 dB and $L_{Amax}$ 45 dB (not normally exceeded 10 to 15 times) | Night-time (23:00-07:00)<br>$L_{Aeq}$ 27 dB |
| Living rooms/diners/bedrooms | Daytime (07:00-23:00)<br>$L_{Aeq}$ 32 dB                                                                | Daytime (07:00-23:00)<br>$L_{Aeq}$ 32 dB    |
| Circulation spaces           | $L_{Aeq}$ 42 dB                                                                                         | $L_{Aeq}$ 42 dB                             |

## Assessment

### Facade sound insulation performance

#### *Overall facade performance*

The minimum facade sound insulation requirements for the facades are given in Table 4. These have been determined to achieve the internal noise criteria for bedrooms and living areas using predicted external noise levels at the facades. Facade zone mark-ups are presented at the end of this memo.

Table 4 Minimum overall facade sound insulation performance requirements – noise ingress

| Facade zone                                                                           | Minimum overall facade sound insulation performance, $R_w+C_{tr}$ (dB) |                 |
|---------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------|
|                                                                                       | Living rooms                                                           | Bedrooms        |
| A  | 37                                                                     | 38              |
| B  | 35                                                                     | 36              |
| C  | 33                                                                     | 34              |
| D  | 28 <sup>1</sup>                                                        | 29              |
| E  | 28 <sup>1</sup>                                                        | 28 <sup>1</sup> |

[1]  $R_w+C_{tr}$  28 dB is typically achievable with standard thermal double glazing (6 mm glass/16 mm cavity/6 mm glass). As such, facade sound insulation has been capped at a minimum requirement of  $R_w+C_{tr}$  28 dB as it is understood that all areas are to be mechanically ventilated with a sealed facade.

For apartments where there are dual facades, the non-glazed facade are rated to have a sound insulation performance of at least 10 dB higher than the glazed facade.

## Glazing requirements

In order to meet the overall facade requirements as set out above, the minimum glazing requirements have been calculated based on the typical glazed areas as taken from the drawings, and the predicted minimum external wall rating of  $R_w+C_{tr}$  48 dB:

- Bedrooms  $\leq$  30% glazed facade to each room
- Some duplex bedrooms have  $\leq$  60% glazed facade to each room
- Living rooms  $\leq$  60% glazed facade to each room

Based on the above glazed areas, the following minimum acoustic ratings for glazing shall be provided, as shown in Table 5.

Table 5 Minimum glazing sound insulation performance requirements to meet overall facade performance

| Facade zone                                                                           | Minimum glazing sound insulation performance $R_w+C_{tr}$ (dB) |                          |                          |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------|--------------------------|
|                                                                                       | Living rooms                                                   | Bedrooms                 |                          |
|                                                                                       |                                                                | $\leq$ 30% glazed facade | $\leq$ 60% glazed facade |
| A  | 35                                                             | 33                       | 36                       |
| B  | 33                                                             | 31                       | 34                       |
| C  | 31                                                             | 29                       | 32                       |
| D  | 28 <sup>1</sup>                                                | 28 <sup>1</sup>          | 28 <sup>1</sup>          |
| E  | 28 <sup>1</sup>                                                | 28 <sup>1</sup>          | 28 <sup>1</sup>          |

[2] Minimum glazing sound insulation rating has been capped at a minimum requirement of  $R_w+C_{tr}$  28 dB as it is understood that all areas are to be mechanically ventilated with a sealed facade.

Based on the external wall information, glazing information and ventilation strategy as set out in the following sections, the most onerous facade sound insulation performance requirements can be achieved.

## External wall

The external wall constructions and locations are set out on the following JM Architect drawings:

- External wall types - MLLW-JMA-ZZ-ZZ-DR-A-214002-A5-C04 dated October 2020
- External wall type elevations - MLLW-JMA-ZZ-ZZ-DR-A-212001-A5-C01 dated May 2020
- External wall type locations – drawing series 21 drawing numbers 4004 to 4013 dated May and October 2020.

## Constructions

From the above drawings, the following external and internal wall element combinations are used for the facade construction as set out in Table 6.

Table 6 Facade constructions – external and internal element combinations

| Element  | Wall type ref.                              | Build-up                                                                                                                                                                                              |
|----------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| External | EWT_01, EWT_02, EWT_02A, EWT_03, EWT_03A    | Cladding system comprising 0.8 mm thick zinc as a minimum.<br>290-250 mm cavity (225 mm cavity to feature reveals) with 200 mm Rockwool cavity insulation (assumed min density 33 kg/m <sup>3</sup> ) |
|          | EWT_04, EWT_04A                             | 102.5 brickwork<br>275-250 mm cavity with 200 mm Rockwool cavity insulation (assumed min density 33 kg/m <sup>3</sup> )                                                                               |
| Internal | SFT_01A, SFT_01B, SFT_01D, SFT_01E, SFT_01F | 9 mm Y-wall, 281 to 380 mm cavity with 225 mm RWA45 insulation to 12.5 mm WallBoard                                                                                                                   |

## Acoustic performance

For each facade construction, it is expected that this will achieve at least  $R_w + C_{tr}$  48 dB which is 10 dB over the highest facade requirement,  $R_w + C_{tr}$  38 dB.

## Glazing

The glazing build-ups and locations are set out in the following Aire Valley documents:

- Location elevations - MLLW-AIR-ZZ-ZZ-DR-X-000091 C01, MLLW-AIR-03-ZZ-DR-X-000092 C01, MLLW-AIR-03-ZZ-DR-X-000093 C01, MLLW-AIR-ZZ-ZZ-DR-X-000094 C01, MLLW-AIR-01-ZZ-DR-X-000095 C03, MLLW-AIR-01-ZZ-DR-X-000096 C03, MLLW-AIR-03-ZZ-DR-X-000097 C01, MLLW-AIR-01-ZZ-DR-X-000098 C01
- Technical Note 38
- P15147-03 - PUnRe Casement
- 8mm-16mm-8.8mm Acoustic Laminate 42dB(-1\_-5).

## Acoustic ratings

The proposed acoustic ratings for each zone are set out in the location elevation drawings with a summary provided by Aire Valley via email on 14 July 2020. A screenshot of the proposed values are set out in Figure 1.

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| Location | Required    | Proposed              |
|----------|-------------|-----------------------|
| Blue     | 28dB Rw+Ctr | 30dB Rw+Ctr (33dB Rw) |
| Green    | 28dB Rw+Ctr | 30dB Rw+Ctr (33dB Rw) |
| Yellow   | 32dB Rw+Ctr | 33dB Rw+Ctr (38dB Rw) |
| Red      | 34dB Rw+Ctr | 35dB Rw+Ctr (41dB Rw) |
| Purple   | 36dB Rw+Ctr | 37dB Rw+Ctr (42dB Rw) |

Figure 1 Screenshot of email from Aire Valley on 14 July 2020 showing proposing glazing sound insulation ratings

Example test data from the manufacture is set out in document *P15147-03 - PURe Casement and 8mm-16mm-8.8mm Acoustic Laminate 42dB(-1\_-5)*. It is noted in an email dated 14 July 2020 from Aire Valley that this is a guide and does not include all the proposed glazing specifications.

Further discussion on the glazing sound insulation performance in regards to framing is provided by Aire Valley via email on 31 July 2020. This email proposes that as a worst case, the glazing performance is expected to reduce by 1 dB due to the framing and therefore the overall glazing rating would still be met.

The glazing rating values proposed by Aire Valley, as presented in Figure 1, are consistent with the glazing requirements presented in Table 5 with a 1 to 2 dB tolerance to the worst case glazing requirements (ie bedrooms with a 60 % glazed facade) for framing and size.

### Ventilation strategy

Natural ventilation is not relied upon to provide background ventilation to all areas. The minimum overall sound insulation requirements should be able to be achieved with the windows closed. The internal MEP noise criteria is set out in Table 3.

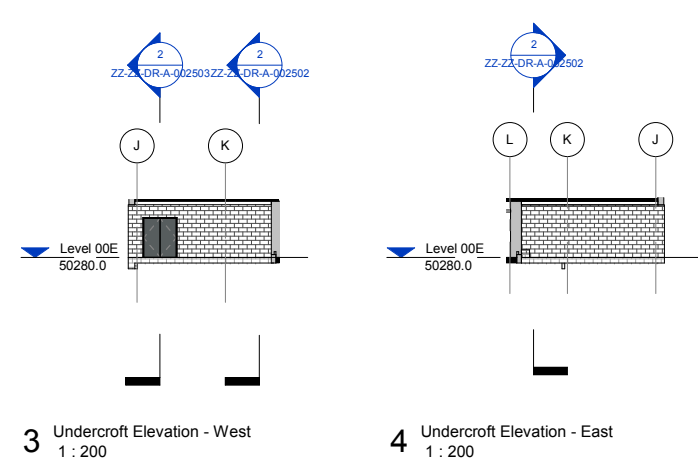
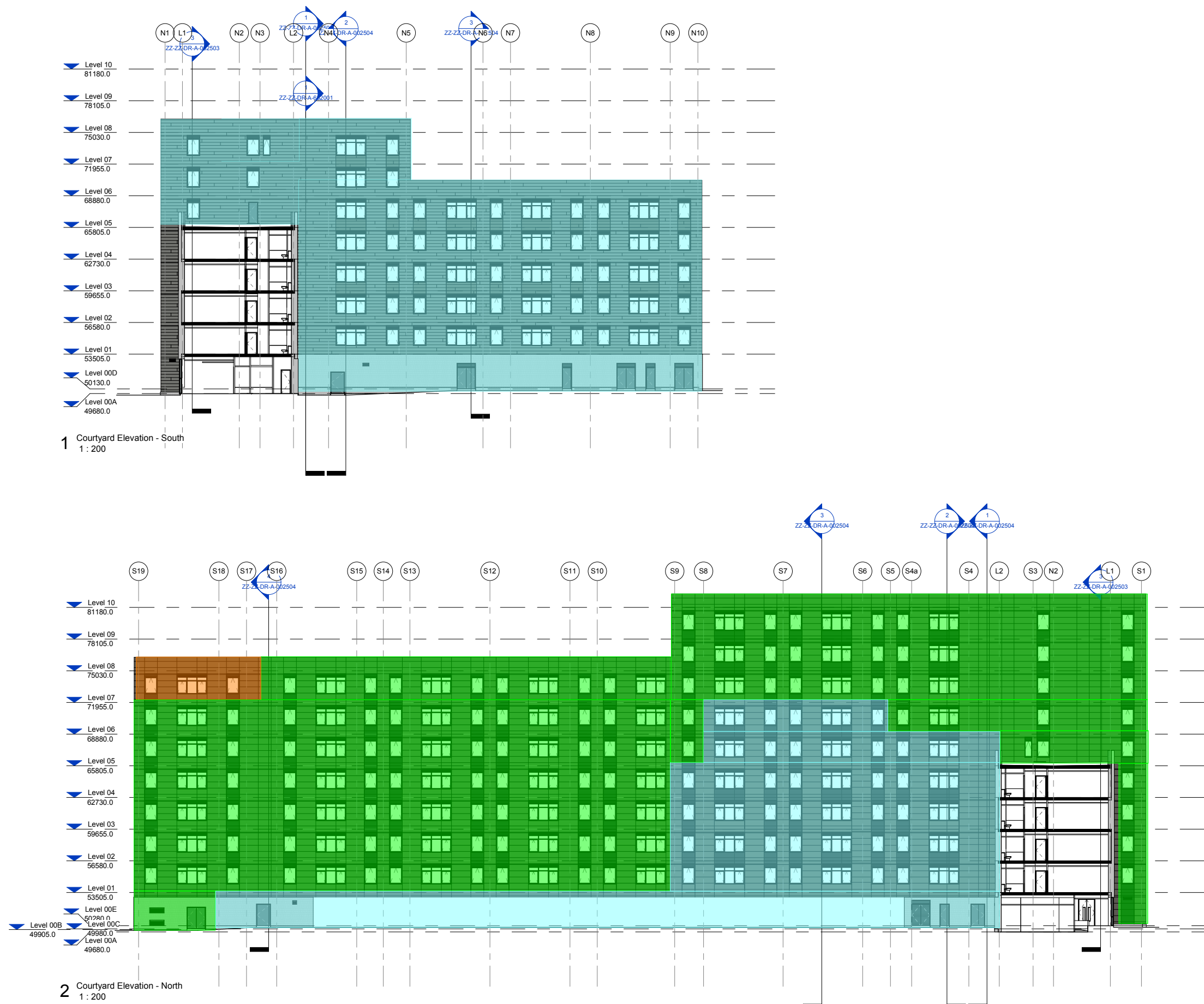
### **Conclusion**

Based on the above information, the facade strategy and building services noise limits, the overall internal noise criteria is expected to be met and as such Planning condition 14 can be discharged.

**Facade zone mark-ups**

Notes :  
1. This drawing should not be scaled, figured dimensions only to be taken  
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | External noise level mark-ups |
| Project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Lampwick, Manchester Life     |
| Project no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 19233                         |
| Version                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | B                             |
| Marked-up by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Jessica Wright                |
| Reviewed by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Matthew Robinson              |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 30 September 2019             |
| <b>Mark-up key</b> <div><div>Day: <math>L_{Aeq}</math> 70-68 dB<br/>Night: <math>L_{Aeq}</math> 65-64 dB <math>L_{A_{Fmax}}</math> 81-80 dB</div><div>Day: <math>L_{Aeq}</math> 67-66 dB<br/>Night: <math>L_{Aeq}</math> 63-62 dB <math>L_{A_{Fmax}}</math> 79-78 dB</div><div>Day: <math>L_{Aeq}</math> 65-61 dB<br/>Night: <math>L_{Aeq}</math> 61-57 dB <math>L_{A_{Fmax}}</math> 77-73 dB</div><div>Day: <math>L_{Aeq}</math> 60-55 dB<br/>Night: <math>L_{Aeq}</math> 56-51dB <math>L_{A_{Fmax}}</math> 72-67 dB</div><div>Day: <math>L_{Aeq}</math> 54-50 dB<br/>Night: <math>L_{Aeq}</math> 50-45 dB <math>L_{A_{Fmax}}</math> 66-61 dB</div></div> |                               |
| <b>SANDY BROWN</b><br>Consultants in Acoustics, Noise & Vibration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                               |



P01  
Rev

Final Issue for Design Team Review  
Description

2019.09.17  
Date

SK  
Dm By

SW  
Ck By

Project  
Lampwick, Ancoats

Title  
Proposed Courtyard Elevations

Client  
John Sisk Ltd

Purpose  
For Design Team Review

Scale  
1 : 200 @ A1

Project - Originator - Volume - Level - Type - Role - Class - Number

MLLW-JMA-ZZ-ZZ-DR-A-002003

Status  
S4 P01

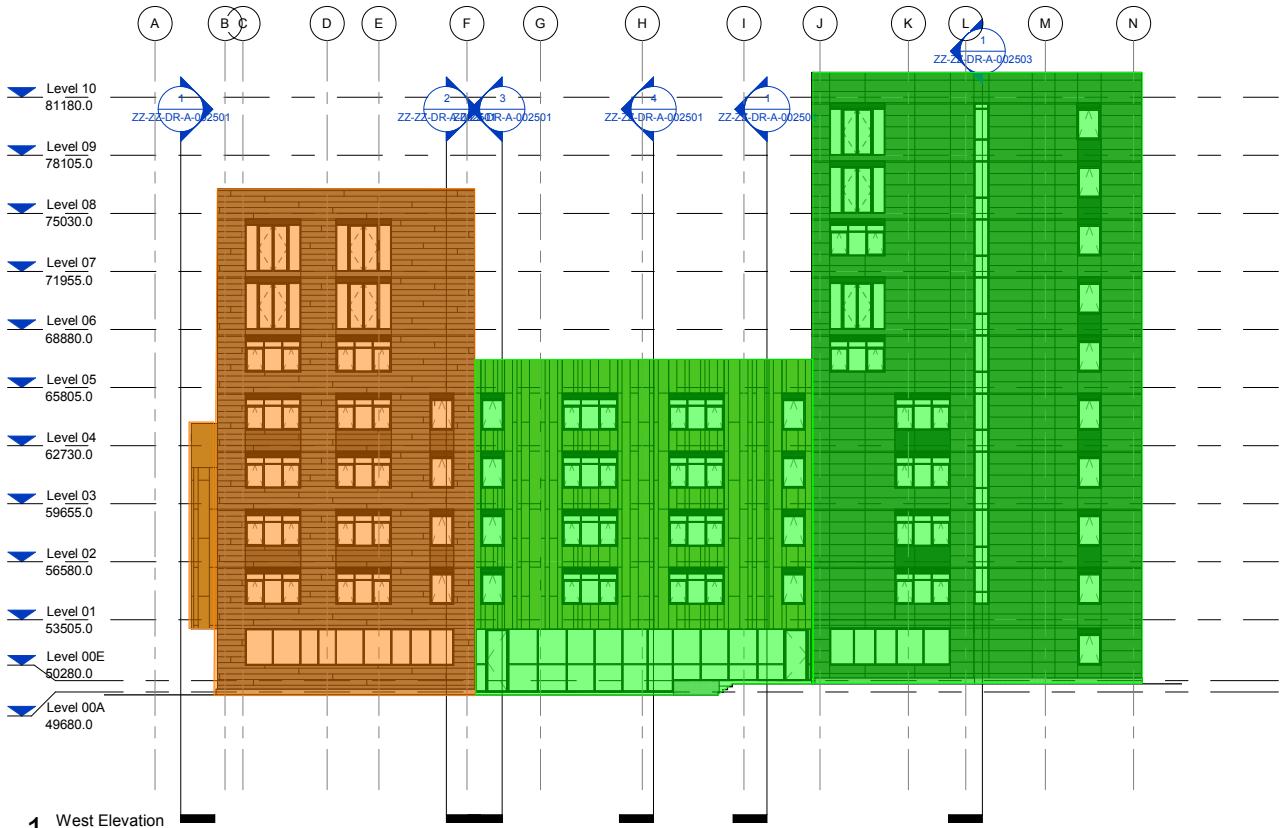
Revision

54 Princess Street  
Manchester  
M1 6HS

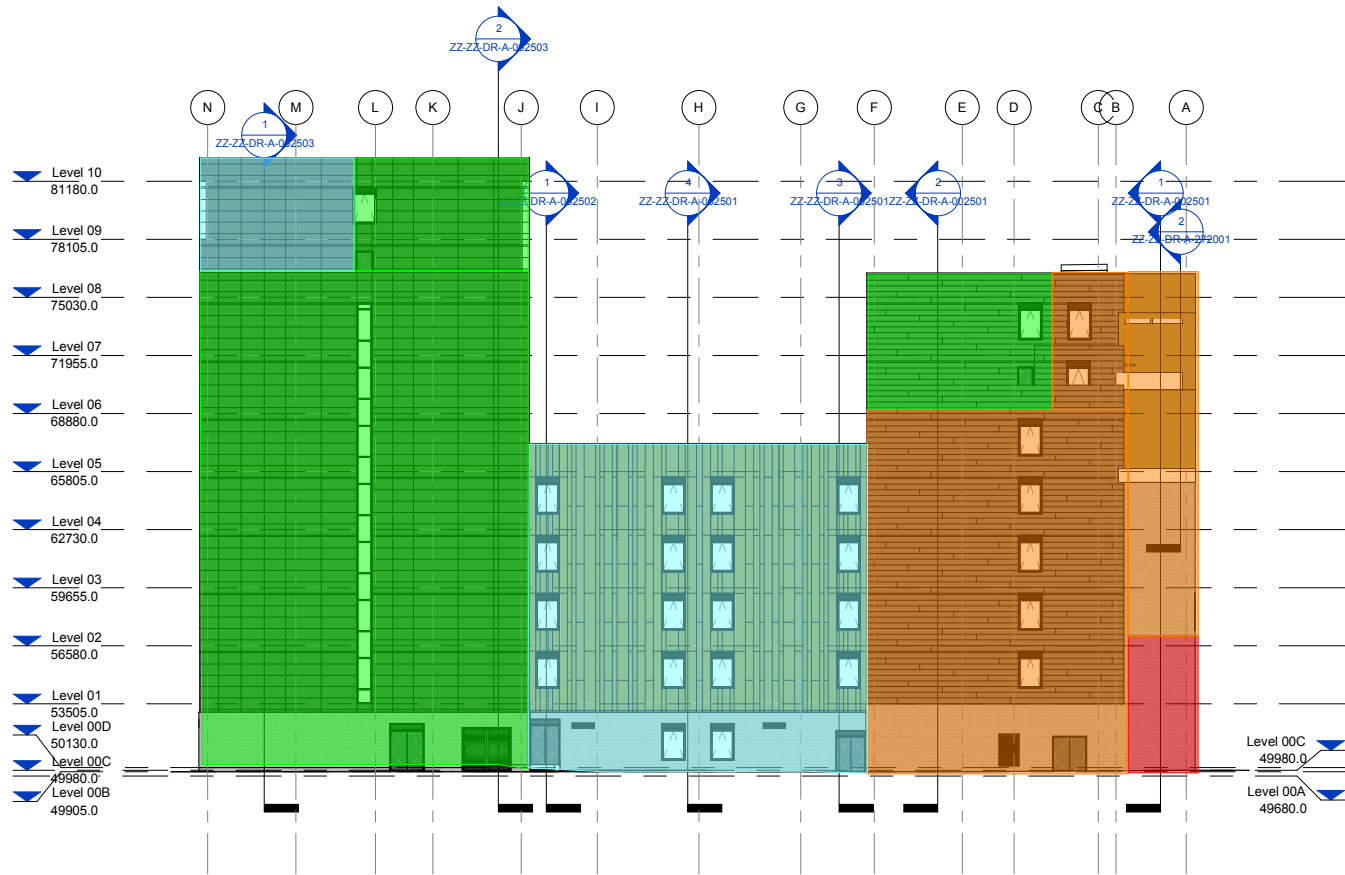
T : 0161 200 6300

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1 West Elevation  
1 : 200



2 East Elevation  
1 : 200

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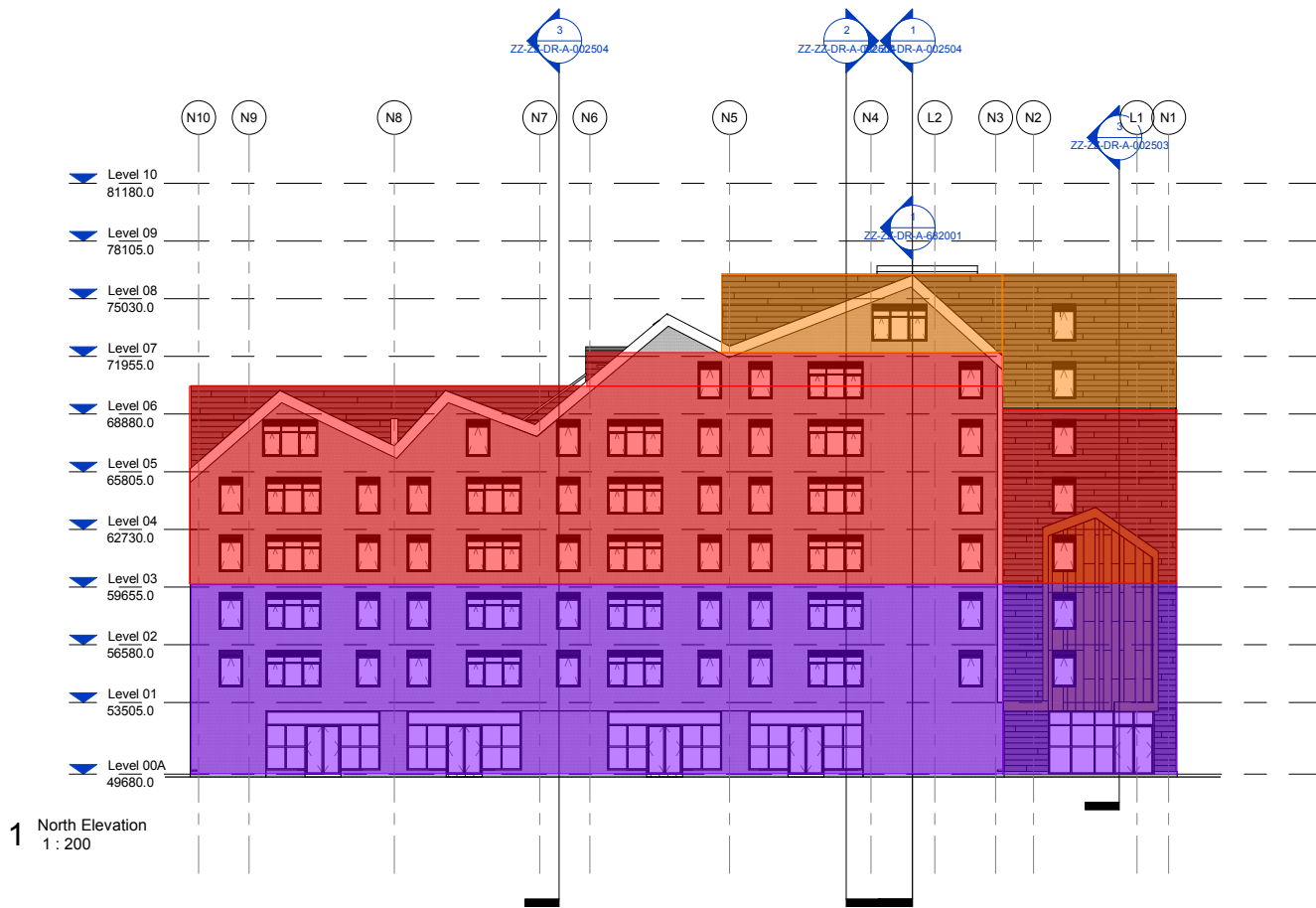
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| Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | External noise level mark-ups |
| Project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Lampwick, Manchester Life     |
| Project no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 19233                         |
| Version                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | B                             |
| Marked-up by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Jessica Wright                |
| Reviewed by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Matthew Robinson              |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 30 September 2019             |
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|     |                                    |            |        |        |
|-----|------------------------------------|------------|--------|--------|
| P01 | Final Issue for Design Team Review | 2019.09.17 | SK     | SW     |
| Rev | Description                        | Date       | Des By | Chk By |

|                |                                                                      |                                              |
|----------------|----------------------------------------------------------------------|----------------------------------------------|
| Project        | Lampwick, Ancoats                                                    | 54 Princess Street<br>Manchester<br>M1 6HS   |
| Title          | Proposed Short Elevations                                            | T : 0161 200 6300                            |
| Client         | John Sisk Ltd                                                        | man@jmarchitects.net<br>www.jmarchitects.net |
| Purpose :      | For Design Team Review                                               | Scale :<br>1 : 200 @ A1                      |
| Drawing Number | Project - Originator - Volume - Level - Type - Role - Class - Number | Status - Revision                            |
|                | MLLW-JMA-ZZ-ZZ-DR-A-002002                                           | S4 P01                                       |

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| Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | External noise level mark-ups |
| Project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Lampwick, Manchester Life     |
| Project no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 19233                         |
| Version                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | B                             |
| Marked-up by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Jessica Wright                |
| Reviewed by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Matthew Robinson              |
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| <b>SANDY BROWN</b><br>Consultants in Acoustics, Noise & Vibration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                               |



|     |                                    |            |        |        |
|-----|------------------------------------|------------|--------|--------|
| P01 | Final Issue for Design Team Review | 2019.09.17 | SK     | SW     |
| Rev | Description                        | Date       | Drn By | Chk By |



Project  
**Lampwick, Ancoats**

Title  
**Proposed Long Elevations**

Client  
**John Sisk Ltd**

Purpose :  
**For Design Team Review**

Drawing Number  
**MLLW-JMA-ZZ-ZZ-DR-A-002001**

54 Princess Street  
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Status  
**S4 P01**