



## PROJECT TECHNICAL MEMORANDUM

**JOB TITLE** : Hotel Southampton Row, London  
**PROJECT NO** : 18390  
**DATE** : 18 March 2016  
**FROM** : Andrew Jameson  
**ISSUED TO** : Veronica Cassin (Harper Downie)

## Hann Tucker Associates

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### RE: 2-6 SOUTHAMPTON ROW, LONDON KITCHEN EXTRACT AHU ACOUSTICS

As part of the redevelopment of the above building, a new air handling unit (AHU) is required to extract air from the main hotel kitchen. This AHU will be located in the courtyard on the second floor chapel roof space and it will, by its nature, generate noise.

Early in design we undertook a baseline environmental noise survey to establish existing noise levels in the courtyard (representative of those at the windows of neighbouring properties that overlook the courtyard) in order to set future noise limits for new plant. These limits were set in line with Local Authority requirements to minimise the noise impact on existing noise sensitive buildings.

Since then, we received plant proposals from the project's mechanical engineers, include the kitchen extract AHU, which were reviewed to ensure the cumulative noise output from all new plant could meet the noise limits set early in the project at the nearest noise sensitive buildings.

The kitchen extract AHU was found to be too noisy and additional noise attestation measures were required to ensure compliance. Various possible solutions were reviewed (e.g. repositioning the unit, reselecting it for quieter models, and screening). However, the unit selected is understood to be the quietest available on the market for the required duty (air flow rates). It is also positioned in the only suitable location and cannot be easily screened.

Consequently, an additional acoustic package was specified. The size of the acoustic package (which is an enhanced casing and a silencer installed on the exhaust air path) is dictated entirely by the required degree of sound reduction. In this case, the smallest package capable of meeting the required sound reduction has been proposed.

The calculations to determine the acoustic package sound reduction performance are enclosed. Without this package, noise levels are likely to exceed the Local Authority compliant noise limits at the nearest neighbouring properties.



We trust this brief overview is clear and of assistance. Should you have any further queries on this matter, please do not hesitate to contact the undersigned directly.

For and on behalf of  
Hann Tucker Associates

**Andrew Jameson**

14/12/2015 HT: 18390 Eng: 0

Project: Southampton Row

System Description: Kitchen Extract

Receiving Room: Windows over Courtyard

# Ventilation Systems Analysis - Breakout

## Kitchen Extract Breakout to Windows over Courtyard

### Breakout Details

|                                               | 63                                 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
|-----------------------------------------------|------------------------------------|-----|-----|-----|----|----|----|----|
| Enter node number after which breakout occurs | 0                                  |     |     |     |    |    |    |    |
| Fan Sound Power Level                         | 88                                 | 85  | 89  | 87  | 82 | 78 | 73 | 68 |
| Duct Wall/Fan Casing Loss Description         | Other Treatment                    |     |     |     |    |    |    |    |
|                                               | 1.0/1.6mm steel, ins (double skin) |     |     |     |    |    |    |    |
| Enter Loss                                    | 12                                 | 15  | 19  | 24  | 28 | 30 | 33 | 33 |
| Smallest Duct/Fan Dimension                   | 2000 mm                            |     |     |     |    |    |    |    |

### Receive Room Details

|                                                       | 63                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 125       | 250       | 500       | 1k        | 2k        | 4k        | 8k        |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------|--------|-----|-------|--------|-----|--------|--------|-----|-------|----|----|----|----|----|----|----|----|-------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----|----|----|----|----|----|----|----|--------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Criterion                                             | dBA [Note: dBA = NR - 10]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |           |           |           |           |           |           |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| Enter Level                                           | 47                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |           |           |           |           |           |           |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| No. of additional nearby systems                      | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |           |           |           |           |           |           |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| Distance from source                                  | 9 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |           |           |           |           |           |           |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| Ceiling Loss                                          | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |           |           |           |           |           |           |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| Room Dimensions:                                      | <table border="1"> <tr> <td>Length</td> <td>100000</td> <td>m</td> </tr> <tr> <td>Width</td> <td>100000</td> <td>m</td> </tr> <tr> <td>Height</td> <td>100000</td> <td>m</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |           | Length | 100000 | m   | Width | 100000 | m   | Height | 100000 | m   |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| Length                                                | 100000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | m         |           |           |           |           |           |           |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| Width                                                 | 100000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | m         |           |           |           |           |           |           |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| Height                                                | 100000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | m         |           |           |           |           |           |           |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| Room Type                                             | Hard Room                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |           |           |           |           |           |           |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| Duct/Fan location                                     | Edge - junction of wall and ceiling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |           |           |           |           |           |           |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
|                                                       | <table border="1"> <tr> <td>Lprev</td> <td>-13</td> <td>-19</td> <td>-21</td> <td>-28</td> <td>-37</td> <td>-44</td> <td>-52</td> <td>-57</td> </tr> <tr> <td>Lpdir</td> <td>52</td> <td>46</td> <td>47</td> <td>40</td> <td>32</td> <td>26</td> <td>18</td> <td>13</td> </tr> <tr> <td><b>Total Sound Pressure Level at Receiver (42dBA)</b></td> <td><b>52</b></td> <td><b>46</b></td> <td><b>47</b></td> <td><b>40</b></td> <td><b>32</b></td> <td><b>26</b></td> <td><b>18</b></td> <td><b>13</b></td> </tr> <tr> <td>Criterion</td> <td>65</td> <td>54</td> <td>46</td> <td>41</td> <td>37</td> <td>34</td> <td>32</td> <td>30</td> </tr> <tr> <td><b>INSERTION LOSS REQUIRED</b></td> <td><b>0</b></td> <td><b>0</b></td> <td><b>1</b></td> <td><b>0</b></td> <td><b>0</b></td> <td><b>0</b></td> <td><b>0</b></td> <td><b>0</b></td> </tr> </table> |           |           |           |           |           |           |           | Lprev  | -13    | -19 | -21   | -28    | -37 | -44    | -52    | -57 | Lpdir | 52 | 46 | 47 | 40 | 32 | 26 | 18 | 13 | <b>Total Sound Pressure Level at Receiver (42dBA)</b> | <b>52</b> | <b>46</b> | <b>47</b> | <b>40</b> | <b>32</b> | <b>26</b> | <b>18</b> | <b>13</b> | Criterion | 65 | 54 | 46 | 41 | 37 | 34 | 32 | 30 | <b>INSERTION LOSS REQUIRED</b> | <b>0</b> | <b>0</b> | <b>1</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> |
| Lprev                                                 | -13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -19       | -21       | -28       | -37       | -44       | -52       | -57       |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| Lpdir                                                 | 52                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 46        | 47        | 40        | 32        | 26        | 18        | 13        |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| <b>Total Sound Pressure Level at Receiver (42dBA)</b> | <b>52</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>46</b> | <b>47</b> | <b>40</b> | <b>32</b> | <b>26</b> | <b>18</b> | <b>13</b> |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| Criterion                                             | 65                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 54        | 46        | 41        | 37        | 34        | 32        | 30        |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |
| <b>INSERTION LOSS REQUIRED</b>                        | <b>0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>0</b>  | <b>1</b>  | <b>0</b>  | <b>0</b>  | <b>0</b>  | <b>0</b>  | <b>0</b>  |        |        |     |       |        |     |        |        |     |       |    |    |    |    |    |    |    |    |                                                       |           |           |           |           |           |           |           |           |           |    |    |    |    |    |    |    |    |                                |          |          |          |          |          |          |          |          |

14/12/2015

HT: 18390

Eng:

Project: Southampton Row

System Description: Kitchen Extract

Receiver: Windows overlooking courtyard

# Ventilation Systems Analysis - Atmospheric

## Kitchen Extract to Windows overlooking courtyard

### Fan Details

Sound Power Data Manufacturer's Data

63 125 250 500 1k 2k 4k 8k

Volume Flow (cu.m/sec) 3.28

Manufacturer's In-Duct Sound Power Levels (dB) 88 85 87 86 82 77 71 64

Verification: Empirical In-Duct Sound Power Levels (dB) 93 92 91 88 83 78 73 68

Total Pressure (Pa) 550

Fan Type Centrifugal (b/curved)

?

Installation Effects Gives 88 85 87 86 82 77 71 64

### Losses

#### Loss Table

| Node                   | Type   | Details                           | 63       | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
|------------------------|--------|-----------------------------------|----------|-----|-----|-----|----|----|----|----|
| 1:                     | Other  | Description: Manu. Attenuator     | Losses 8 | 13  | 23  | 37  | 37 | 26 | 18 | 13 |
| 2:                     | Grille | Height (mm): 600 Width (mm): 1200 | 5        | 2   | 0   | 0   | 0  | 0  | 0  | 0  |
| I Power Level @ Grille |        |                                   | 75       | 70  | 64  | 49  | 45 | 51 | 53 | 51 |

**Receiver Details**

**63 125 250 500 1k 2k 4k 8k**

Criterion at Receiver **47** dBA [Note: dBA = NR - 10]

**47dBA** 65 54 46 41 37 34 32 30

Enter Level **47** dBA

Distance from Source **9** m

No. of nearby systems   
**0**

Directivity: Horizontal **0** °  
Vertical **0** °

**Directivity** +2 +3 +4 +5 +6 +6 +6 +6

Radiation: **Quarter-spherical**

**Divergence** 24 24 24 24 24 24 24 24

**Noise Level at Receiver (42dBA)** 53 49 44 30 27 33 35 33

**INSERTION LOSS REQUIRED** 0 0 0 0 0 0 3 3