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Acorn House
314-320 Gray's Inn Road, London

Acoustic Design Review
Report 26359.ADR.01 RevA

MYCO

Report 26359.ADR.01 Revision History			
First Issue Date: 08/12/2023			
A	13/01/2025 Assessment of external building services.	D	
B		E	
C		F	
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1.0 INTRODUCTION

The aim of this report is to define the acoustic requirements for the proposed development at Acorn House, 314-320 Gray's Inn Road, London. Performance specifications will be established, reflecting a pragmatic approach without compromising on the building's intended use.

The following sections describe the acoustic recommendations for the different areas and the advantages that may be attained through implementation. The basis for all design recommendations within this report is Approved Document E (ADE) 2003 of the 2010 Building Regulations.

2.0 INTERNAL BUILDING FABRIC

2.1 Design Aspirations

The client has expressed a preference to provide sound insulation levels that would comfortably meet the Approved Document E (ADE) 2003 and Building Regulations requirements.

Approved Document E 2003 – Requirement E1

In order to satisfy the requirements of the Building Regulations, the minimum sound insulation performance criteria, as shown in Table 2.1, should be met by all wall constructions (i.e. separating elements between different residential dwellings).

Element	Design Criteria – Dwelling-houses and Flats	
	Airborne	Impact
Wall	$D_{nT,w} + C_{tr} \geq 45$ dB	N/A
Floor	$D_{nT,w} + C_{tr} \geq 45$ dB	$L'_{nT,w} \leq 62$dB

Table 2.1 Building regulations requirements for new-build party elements

Approved Document E 2003 – Requirement E2

Requirement E2 specifies that dwelling-houses, flats and rooms for residential purposes shall be designed and constructed in such a way that:

- internal walls between a bedroom or a room containing a water closet, and other rooms; and
- internal floors provide a reasonable resistance to sound.

Requirement E2 does not apply to:

- an internal wall which contains a door;
- an internal wall which separates and en-suite toilet from the associated bedroom; or
- existing walls and floors in a building which is subject to material change of use.

The requirement states that the walls and floors listed above must achieve a laboratory-rated sound insulation performance of at least 40 dB R_w.

On-site testing of internal partitions is not required by the Building Regulations.

2.2 Residential Criteria

We understand that a +5dB uplift of the criteria contained within ADE 2003 is to be targeted within the residential dwellings. Therefore, the following criteria are to be achieved by all wall and floor constructions:

Element	Airborne	Impact
Separating wall	$D_{nT,w} + C_{tr} \geq 50dB$	N/A
Separating floor	$D_{nT,w} + C_{tr} \geq 50dB$	$L'_{nT,w} \leq 57dB$
Internal walls/floors	$R_w \geq 45dB$	N/A

Table 2.2 Project criteria

2.3 Party Wall Constructions

It is understood that the proposed wall constructions to be used between residences are as follows:

Cavity Wall 300 (ref. Pty.1)

- 2No. 15mm SoundBloc on both sides
- 192mm cavity featuring:
  - 48mm I-stud with Isover Acoustic Partition Roll (APR 1200)
  - 144mm cavity with Isover Acoustic Partition Roll (APR 1200)
  - 48mm I-stud with Isover Acoustic Partition Roll (APR 1200).

Cavity Wall 300 to Smoke Shaft (ref. Pty.1a)

- 2No. 15mm SoundBloc
- 192mm cavity featuring:
  - 48mm I-stud with Isover Acoustic Partition Roll (APR 1200)

- 144mm cavity with Isover Acoustic Partition Roll (APR 1200)
- 48mm I-stud with Isover Acoustic Partition Roll (APR 1200)

- 2No. 15mm British Gypsum FireCase.

Cavity Wall 200 (Between bathrooms) (ref. Pty.2)

- 2No. 15mm SoundBloc
- 196mm cavity featuring:
  - 48mm I-stud with Isover Acoustic Partition Roll (APR 1200)
  - 100mm cavity with Isover Acoustic Partition Roll (APR 1200)
  - 48mm I-stud with Isover Acoustic Partition Roll (APR 1200)
- 2No. 15mm British Gypsum FireCase.

Each of the above constructions would be expected to meet the project requirements. It should be noted however, that there would be scope to reduce the amount of proposed mineral wool to the following and still achieve the requirements (i.e. +5dB uplift above ADE 2003):

Pty.1 and Pty.1a:

- Remove the 2No. 48mm APR1200
- Retain the 144mm Isover Acoustic Partition Roll (APR 1200)

Pty.2:

- Remove the 2No. 48mm APR1200
- Retain the 100mm Isover Acoustic Partition Roll (APR 1200)

2.4 Internal Wall Constructions

It is understood that the proposed wall constructions to be used between residences are as follows:

Partition 100mm (ref. Int.1a)

- 1No. 15mm SoundBloc on both sides
- 70mm cavity featuring:
  - 22.5mm metal C-stud
  - 25mm metal C-stud with Isover Acoustic Partition Roll (APR 1200)
  - 22.5mm metal C-stud.

Partition 130mm (ref. Int.1b)

- 1No. 15mm SoundBloc on both sides

- 100mm cavity featuring:
  - 37.5mm metal C-stud
  - 25mm metal C-stud with Isover Acoustic Partition Roll (APR 1200)
  - 37.5mm metal C-stud.

Partition with FireLine 100mm (ref. Int.2a)

- 2No. 12.5mm FireLine on both sides
- 50mm cavity with metal C-stud.

Partition with FireLine 155mm (ref. Int.2b)

- 2No. 15mm FireLine on both sides
- 95mm cavity with metal C-stud.

The above constructions would be expected to meet the project requirements.

2.5 Shaftwalls/Wall Linings

The following linings have been reviewed and their suitability determined within the following table:

Configuration	KPA Recommendations (If required)
Int.3a (boxing) + Ext.9 (external wall)	Suitable.
Int.4 (lining) + Int.7b (core concrete wall)	Suitable.
Int.5 (lining) + Int.9a (core concrete wall)	Suitable.
Int.8	Suitable.

Table 2.3 Assessment of shaftwalls/wall linings

2.6 Separating Floor Constructions

The following separating floor construction configurations have been reviewed and their suitability determined within the following table. Full construction details are enclosed within Appendix B.

Configuration (Floor + Ceiling)	Description	KPA Recommendations (If required)
RAF1 + Exposed concrete soffit	GF Office to Basement Office	Suitable.
FL.9 + Exposed concrete soffit	GF Bike Store to Basement Office	Suitable.
Fl.1/.2/.3 + CL.1	L1 Residential to Retail/Refuse/Bike Store/Substation	Suitable to achieve ADE+5dB.

Configuration (Floor + Ceiling)	Description	KPA Recommendations (If required)
Fl.1/.2/.3 + CL.1	Typical separating floor between residential units	Suitable to achieve ADE+5dB.
Fl.2 + CL.2	Typical separating floor between residential bathrooms	Suitable to achieve ADE+5dB.
Fl.1/.2/.3 + CL.4	L5 Flat 22 to L4 Flat 17/18	Suitable to achieve ADE+5dB.
F1.10 + CL.1	L9 Communal Room to L8 Residential	Suitable to achieve ADE+5dB.

Table 2.4 Floor configurations and recommendations

It has been noted that flanking strips have been proposed to lap up at the separating wall and under the floor finish. This is incorrect, however, and we would recommend that the resilient layer is lapped up under the skirting board and above the floor finish.

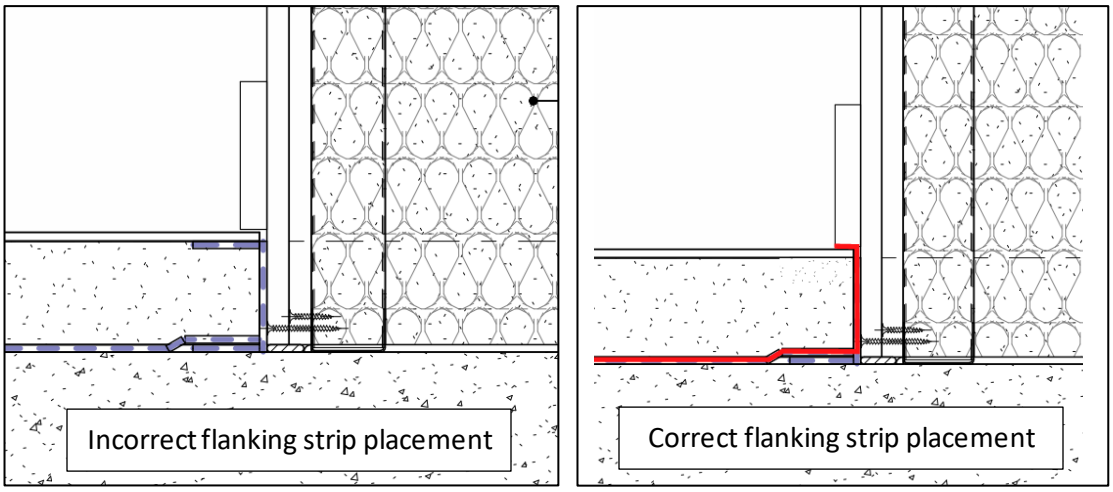


Figure 2.1 Ideal flanking strip placement

2.7 Wall Junctions and Penetration Details

Interfaces between walls and all other adjacent elements should be built to ensure that the sound insulation performance of the wall is not compromised. All gaps should be tightly packed with mineral wool and all joints should be sealed with a flexible sealant, such as silicone caulk.

Blockwork Walls

All blockwork walls should be built up from an isolating strip such as Regupol 6010XHT, or similar. In addition, the isolating strip should be placed at the junction of any party walls and external walls.

Ideally, a gap between the head of the wall and the underside of the soffit should not be greater than 10mm. A polyethylene backing rod could be inserted in the gap with tightly

packed mineral wool while silicone caulk is used to seal the joint. When constructing cavity walls, care should be taken not to drop debris into the cavity, which may bridge the leaves of construction. The aforementioned detail is illustrated in DWG.1.

Timber/Metal Stud Walls

Timber/Metal Stud walls should be built using the correct deflection head to minimise flanking transmission of noise. The correct detail is illustrated in DWG.2.

Proposals

The proposed junctions have been reviewed and the following should be adhered to (where applicable):

Party Wall to Party Wall 'T' Junction Plan (ref. dl.04)

In order to prevent flanking through the wall cavities, we would recommend that the SoundBloc is continuous as presented in the following detail:

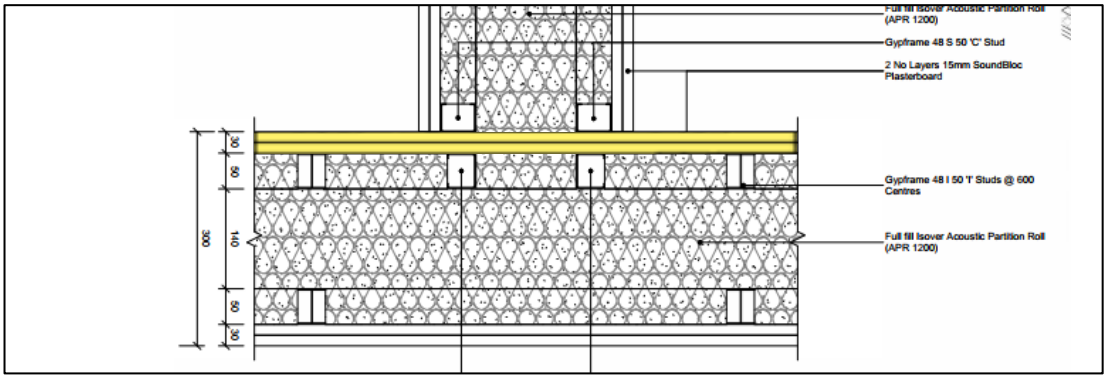


Figure 2.2 KPA proposed junction detail

2.8 Pipes and Penetrations

Where any ducts, pipes, conduits or other services penetrate the wall, provide an air-tight seal between the service and partition using a flexible sealant. All gaps should be tightly packed with mineral wool and sealed with plasterboard pattress and mastic seal.

2.9 Door Requirements

In order to comply with the requirements of Approved Document E, residential front doors should have a minimum sound rating of 26dB R_w.

We would recommend that ancillary spaces (such as lobbies, stores, water closets) should have a minimum rating of 18dB R_w. Doors opening into meeting rooms and conference rooms should have a minimum rating of 32dB R_w.

Applicable areas	Door Specification	Requirement?
Residential front doors	29 dB R_w	Required by ADE2003
Ancillary spaces (lobby, store, WC)	18-22 dB R_w	N/A
Meeting/conference rooms	32-35 dB R_w	N/A

Table 2.5 Door specification

Some general points that should be followed regarding the acoustic performance of doors are as follows.

- Non-hardening caulk should be used to seal joints airtight
- If hollow metal frames are used, they should be fibre- or grout-filled
- Doors should be gasketed around the entire perimeter to be airtight when closed
- Seals should be adjustable to compensate for wear, thermal movement, settlement of building structure and other factors that cause misalignment of the doors
- Good quality hydraulic closers should be fitted on all doors likely to be subjected to heavy use.

2.10 Reverberation Control in Common Spaces

Approved Document E Requirement E3 of the Building Regulations states that for entrance halls, corridors, and hallways, an area equal to or greater than the floor area should be covered with a Class C absorber or better.

We would therefore recommend one of the following Gypsum ceiling systems:

Gypsum Quick-Lock Grid System		
Product	**Ceiling Void Depth**	**Absorption Class**
Gyptone Point 11	100mm	C
	200mm	C
	300mm, with min. 75mm mineral wool insulation (density 45kg/m³)	C
Gyptone Line 4	100mm, with min. 50mm mineral wool insulation (density 45kg/m³)	C
	200mm	C
	300mm, with min. 75mm mineral wool insulation (density 45kg/m³)	C
Gyptone Sixto 60	100mm	C
	100mm, with min. 75mm mineral wool insulation (density 45kg/m³)	B
	300mm, with min. 75mm mineral wool insulation (density 45kg/m³)	B
Gyptone Quattro 20	200mm	C
	300mm, with min. 75mm mineral wool insulation (density 45kg/m³)	B
Gyptone Quattro 50	200mm	C
Gyptone Quattro SS Plank	100mm, with min. 50mm mineral wool insulation (density 45kg/m³)	C

Gypsum Quick-Lock Grid System		
	100mm	C
	200mm	C
Gyptone Point 15 Plank	100mm	C
Gyptone Line 8 Plank	200mm	C

Table 2.6 Gypsum Quick-Lock reverberation treatment options

Alternatively, should a monolithic ceiling be deemed more appropriate, we would recommend one of the perforated Gypsum boards outlined in Table 2.7.

Product	Absorber Class
Gyptone Quattro 41	C
Gyptone Quattro 43	C
Gyptone Sixto 63	C

Table 2.7 Gypsum reverberation treatment options

2.11 Reverberation Control in Offices

The following assessment of reverberation within offices has been based upon the following proposed room finishes:

Space	Finishes		
	Floor	Ceiling	Walls
Basement Office	RAF on screed and insulation	Exposed concrete soffit	Plasterboard
Ground Floor Office	RAF on slab	Exposed concrete soffit	Plasterboard

Table 2.8 Gypsum reverberation treatment options

We would recommend that the following surface area (m^2) should be placed to evenly cover the ceiling, ideally above desk areas:

- Basement Office – 105m^2 of Class A absorptive finish coverage
- Ground Floor Office – 60m^2 of Class A absorptive finish coverage

If the above would not be desirable, or practicable, we would recommend that KPA undertake a more detailed reverberation investigation.

3.0 External Building Fabric

3.1 Internal Ambient Noise Level Criteria

BS8233:2014 *'Sound insulation and noise reduction for buildings'* describes recommended internal noise levels for residential spaces. These levels are shown in Table 3.1.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Rooms	35 dB(A)	-
Dining	Dining Room/area	40 dB(A)	-
Sleeping (daytime resting)	Bedrooms	35 dB(A)	30 dB(A)

Table 3.1 BS8233 recommended internal background noise levels

It should be noted that the recommended internal noise levels outlined above are not applicable under "purge ventilation" conditions as defined by Approved Document F of the Building Regulations, as this should only occur occasionally (e.g. to remove odour from painting or burnt food). However, the levels above should be achieved whilst providing sufficient background ventilation, either via passive or mechanical methods.

Internal noise levels (including building services and external noise intrusion) within offices and the Level 9 Community Room should be designed to achieve the following NR Levels:

Room type	Noise rating (NR)
Open-plan offices	38
Ancillary spaces	40
Toilets, lift lobbies	40-45
Level 9 community room	40

Table 3.2 Acoustic design criteria for building services noise

3.2 Non-Glazed Building Fabric

The proposed external walls would be commensurate with achieving the internal noise levels above (provided that the glazing specification in the following section is adhered to).

3.3 Glazing

Glazing specifications are enclosed within Appendix A of this report.

Please note that our glazing specifications are based upon the survey measurements and façade noise level predictions from Sandy Brown's *Acoustic Planning Report (19 Aug 2020; 19373-R03-C).*

4.0 EXTERNAL BUILDING SERVICES

4.1 Planning Condition 5

We understand the following Planning Condition 5 has been imposed by the Local Authority:

"Prior to installation of the relevant plant/ machinery/ equipment, details shall be submitted to and approved in writing by the Council, of the external noise level emitted from that plant/machinery/ equipment and acoustic and anti-vibration mitigation measures as appropriate.

The mitigation measures shall ensure that the external noise level emitted from plant, machinery/ equipment will be lower than representative/typical existing background noise level by at least 10dBA, by 15dBA where the source is tonal, as assessed according to BS4142:2014 at the nearest and/or most affected noise sensitive premises, with all machinery operating together at maximum capacity.

The mitigation measures shall ensure that the plant/equipment are mounted with proprietary anti-vibration isolators and fan motors are vibration isolated from the casing and adequately silenced.

All mitigation measures as approved shall be installed prior to first use of the equipment, and the equipment and mitigation measures shall thereafter be retained and maintained in accordance with the manufacturer's recommendations."

4.2 External Plant Noise Emissions Criteria

An environmental noise survey has been conducted by Sandy Brown. The methodology and results are presented within their *Acoustic Planning Report (dated 19-08-2020; ref. 19373-R03-C).*

Based upon the results of the survey and Planning Condition 5, the following external plant noise emissions criteria should not be exceeded:

Period	Maximum plant noise emissions (dBA) to be achieved at 1 metre from the nearest noise sensitive residential receiver
Noise sensitive receivers along Swinton Street:	
Daytime (0700-2300)	47
Night-time (2300-0700)	43
Noise sensitive receivers along Grays Inn Road:	
Daytime (0700-2300)	45
Night-time (2300-0700)	41

Table 4.1 Plant noise emissions criteria

4.3 Nearest Noise Sensitive Receptors

The nearest noise sensitive receivers (NSR1) have been identified as follows. The approximate distances from the plant (comprising both vertical and horizontal distance) are presented int the following figure.

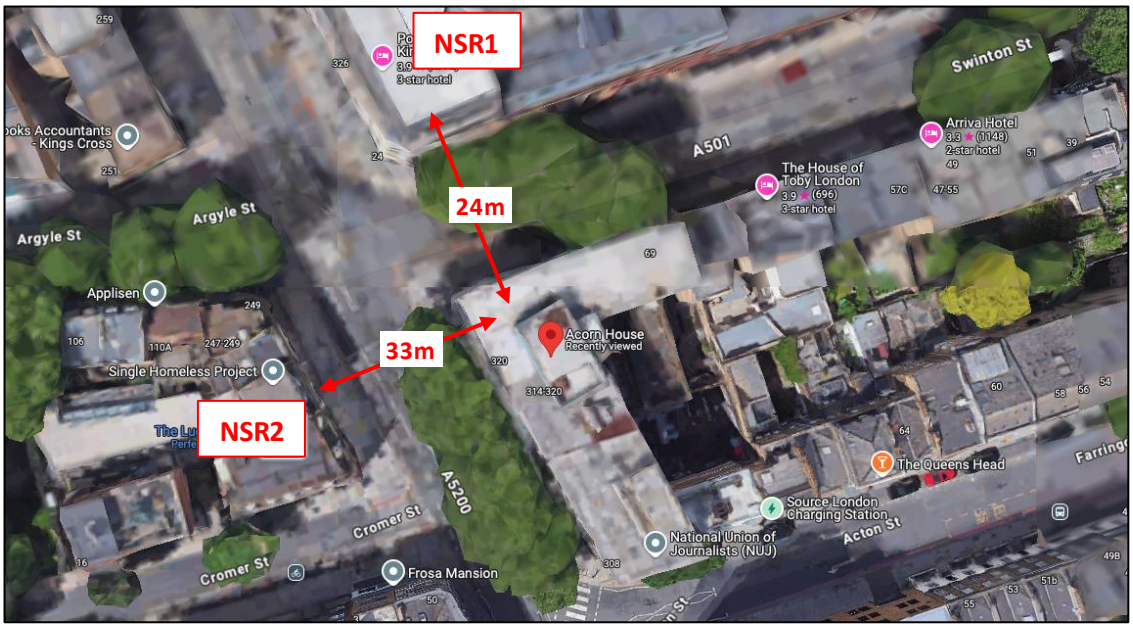


Figure 4.1 Nearest noise sensitive receptors

4.4 Proposed Plant

We understand that the following plant (including the stated manufacturer's noise levels) have been proposed within the development:

- (1No.) Generator M138 – 95dBA L_w
- (4No.) ASHP TS-M-32 – 61dBA L_w

- (2No.) Twin Fans EST19H & EST20H – 84 dBA L_w (induct inlet), 89 dBA L_w (induct outlet) and 79 dBA L_w (breakout)
- (3No.) Outdoor AC Units – 75dBA L_w (PUMY-P300YBM2), 73dBA L_w (PUMY-P250YBM2), 69dBA L_w (SUZ-KA71VA6).

The plant is proposed to be located at the following positions:

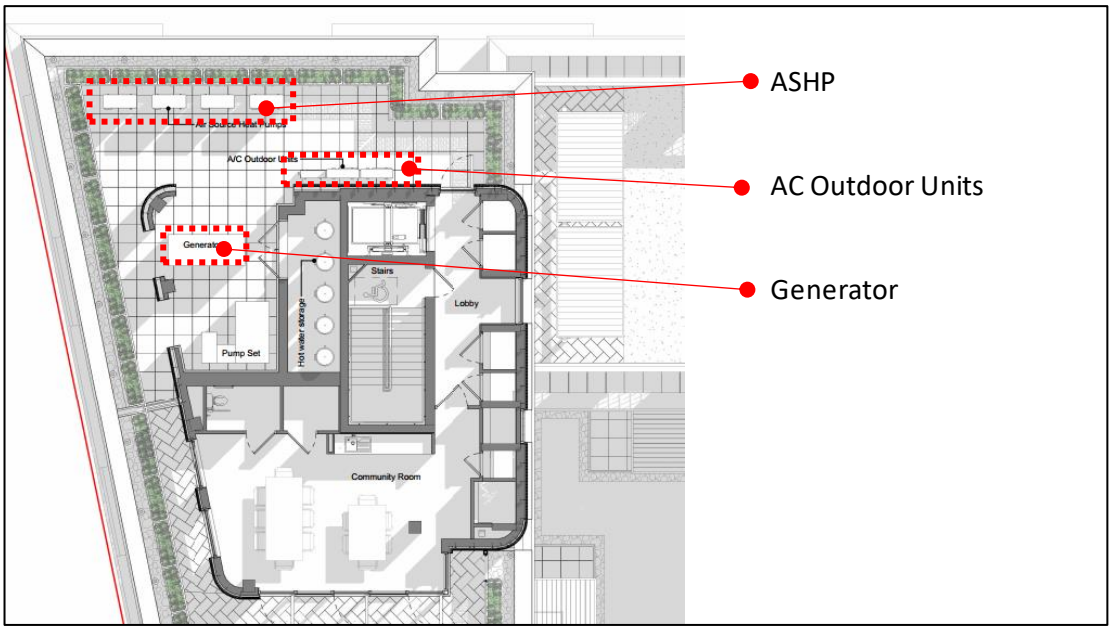


Figure 4.2 Plant layout (9th Floor)

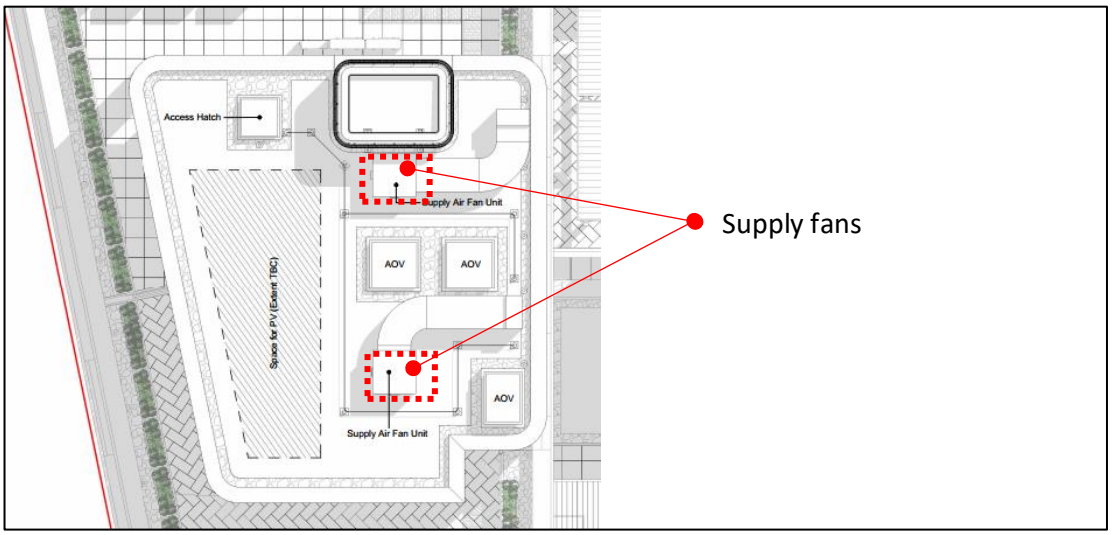


Figure 4.3 Plant layout (Roof)

4.5 Resultant Noise Levels

The following noise levels have been calculated at each noise sensitive receptor. Full acoustic calculations are enclosed within Appendix C.

Noise Sensitive Receptor	Criteria	Resultant Noise Level
NSR1 (Swinton Rd.)	≤47dBA Daytime ≤43dBA Night-time	42dBA
NSR2 (Grays Inn Rd.)	≤45dBA Daytime ≤41dBA Night-time	40dBA

Table 4.2 Resultant noise levels

Based upon the current proposals, our calculations indicate that no mitigation measures would be required in order to achieve the requirements of the Local Authority. Therefore, the criteria of Planning Condition 5 have been met and should therefore be discharged.

5.0 INTERNAL BUILDING SERVICES

5.1 Internal Plant Noise

Criteria

Mechanical ventilation systems should be designed to meet the internal noise levels as defined in CIBSE Guide A (2015), as shown in Table 5.1 within residential spaces:

Room Type	L_{Aeq}, dB	NR Level
Bedrooms	30	25
Living Rooms	35	30
Kitchen	45-50	40-45

Table 5.1 CIBSE Guide A 2015 guidance levels for mechanical building services

Noise level criteria have been determined for offices in Table 3.2.

Where passing through, or above habitable spaces, air velocities within ducts should be controlled to the values shown in Table 5.2, in parallel to the installation of a suitably selected silencer schedule, or via the installation of lagging.

Description	NR Criterion	
	NR35	NR30
Main Branch	5 m/s	4 m/s
Grille	2.5 m/s	2 m/s

Description	NR Criterion	
	NR35	NR30
Diffuser	2 m/s	1.5 m/s
Return air stub duct in ceiling	3 m/s	2 m/s

Table 5.2 Maximum airflow velocities

5.2 MVHR Limiting Noise Level Specification

Internal MVHR should be selected and mitigated in order to achieve the following limiting noise level specifications:

Description	Limiting induct sound power level (dB)							
	63	125	250	500	1k	2k	4k	8k
Residential MVHR:								
Roomside MVHR Supply	48	48	44	49	32	27	23	21
Roomside MVHR Extract	50	50	43	39	32	26	22	20
Office MVHR:								
Roomside MVHR Supply	59	59	55	60	43	38	34	32
Roomside MVHR Extract	61	61	54	50	43	37	33	31
Level 9 Community Room MVHR:								
Roomside MVHR Supply	62	62	58	63	46	41	37	35
Roomside MVHR Extract	64	64	57	53	46	40	36	34

Table 5.3 Limiting MVHR Specs

5.3 Fan Coil Units Limiting Noise Level Specification

Internal FCUs (comprising both inlet/casing radiated and discharge noise levels) should be selected and mitigated in order to achieve NR Levels presented within Table 3.2.

5.4 Fan Coil Unit Cupboard Doors

Doors to the FCU cupboards should be acoustically rated to R_w30 dB and should consist of a minimum 40mm thick solid-core timber door with acoustic compression seals all round.

5.5 Lighting and Electrical Services

Downlighters or recessed lighting may be installed at no more than one unit per $2m^2$ of ceiling area, at centres not less than 0.75m and into openings not exceeding 100mm diameter.

Back-to-back recesses/cut-outs, e.g. for wall sockets and light switches, shall be avoided in walls separating apartments or habitable spaces wherever possible. If unavoidable, acoustic detailing shall be agreed with the acoustic consultant, such that the sound insulation of the wall is maintained. We would recommend a minimum spacing of 600mm between staggered sockets on opposite sides of a party wall, with back-boxes made out of 2No. 12.5mm FireLine boards or sealed with PuttyPad (or similar).

5.6 Hydraulic Systems

Hydraulic systems shall be designed and installed to minimise audibility of water/waste noise within the residential areas of the apartments.

The following controls shall be adopted to minimise noise emissions from hydraulic systems.

- Avoid hard grouting and chasing of water pipes in walls, particularly where walls are common with noise sensitive areas
- In noise sensitive areas, support pipes with clamps having a soft neoprene sleeve.
- Route all rainwater down pipes outside the building or, alternatively, via service cupboards or risers boxed-in by means of 2x12.5mm layers of FireLine. Avoid bends and T-junctions in ceiling spaces above noise sensitive areas
- Do not support pipework from lightweight constructions.

Where it is unavoidable that hydraulic systems pass through residential spaces, they must be concealed. As a minimum, bulkheads shall consist of minimum two layers of 12.5mm plasterboard with staggered and sealed joints. When concealing waste systems, the bulkhead shall also be lined internally with 50 mm mineral fibre insulation (30 – 40 kg/m^3)

Where pipework passes through floors, penetrations shall ensure effective acoustic sealing around the pipes. This would be achieved by initially providing all pipework with a resilient sleeve detail. Large floor openings can be in-filled using a proprietary cementitious fire-stopping compound to the depth of the slab, whilst smaller openings can be loosely packed with mineral fibre insulation and closed-off with plasterboard pattresses above and below the slab. If using fire-stopping compound, it must be ensured that pipework holes in the formwork are cut oversize to prevent contact with the pipes. Any gaps remaining around pipework penetrations must be sealed with a continuous bead of non-hardening mastic.

General principles with regards to waste systems behind lightweight constructions within apartments are shown in Table 5.4.

Pipework Construction	Typical Door Construction
Cast iron pipework	No treatment necessary.
Copper pipework	Wrapped in minimum 25mm thick acoustic insulation/foam and lag with 5kg/m^2 loaded vinyl sound barrier material, or similar.

Pipework Construction	Typical Door Construction
Plastic pipework	Wrapped in minimum 50mm thick acoustic insulation/foam and lag with 5kg/m^2 loaded vinyl sound barrier material, or similar.
Plastic pipework to taps	No treatment necessary.
Drainage systems	Wrapped in minimum 25mm thick acoustic insulation where concealed by lightweight constructions within residential areas

Table 5.4 Acoustic specification of SVP

5.7 Control Panels

Where located within party walls, recessed control panels should be backed with two layers of 12.5mm SoundBloc plasterboard, or similar. The control panel should be fitted within the wall such that periphery gaps are minimal (less than 5mm width). The control panel fascia should incorporate a rubber gasket all round to ensure an effective acoustic seal with the plastered face of the wall. Control panels on either side of a wall should be offset by at least 500mm.

5.8 Access Panels

Where access panels are required, a proprietary access panel solution would be suitable, such as the following:

- http://www.ceildoorproducts.co.uk/wp-content/uploads/2014/03/CTMP_dB.pdf
- https://www.accesspanels.co.uk/access-panels/acoustic-rated

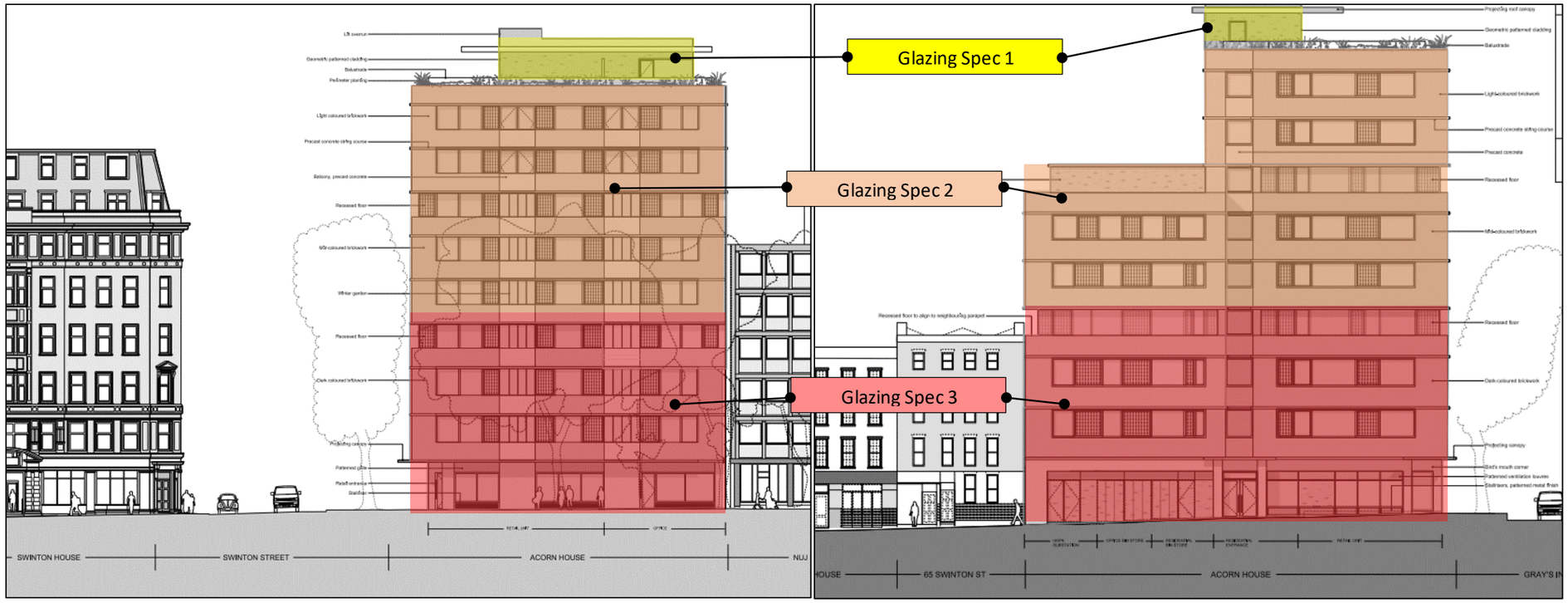
Another option would be a hinged door with rebated meeting stile, with compression seals to the perimeter. This would likely need to be constructed from timber, such as 18mm MDF, of greater mass per unit are than 12.5mm SoundBloc (10.6kg/m^2) and, when closed, the latch should be set to ensure that the door exerts positive pressure on the compression seals to maintain the acoustic integrity of the panel.

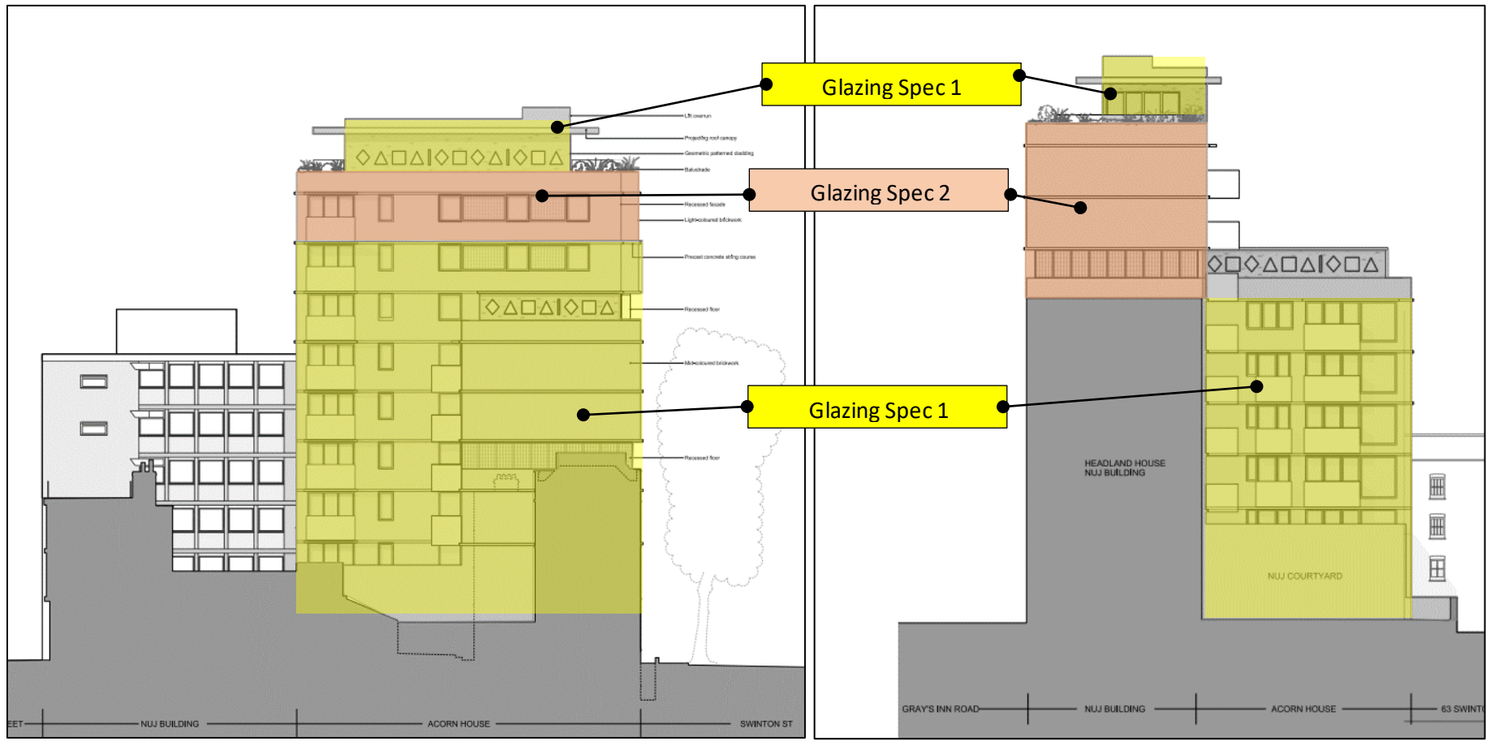
6.0 CONCLUSION

The drawings for the proposed development have been reviewed and suitable acoustic specifications have been determined.

While a realistic approach to the actual needs of the various spaces has been adopted, it was deemed necessary to refine the acoustic provision of some elements such as the acoustic detailing of junctions, beyond the base build specification currently proposed.

Calculations for plant noise emissions have been undertaken in order to ascertain the noise level of the plant at the nearest noise sensitive receptors. Noise levels have been assessed to be in line with the requirements of the Local Authority and therefore Planning Condition 5 should be discharged.

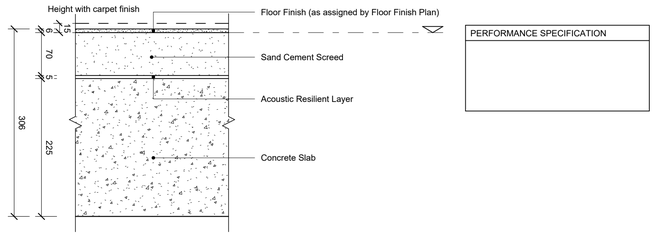




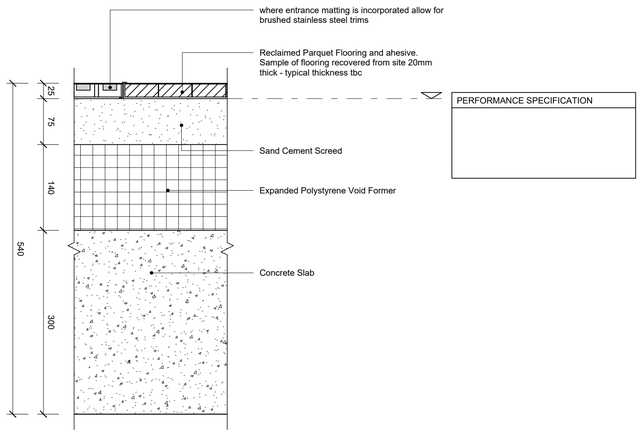
Minimum octave band sound reduction index (SRI) values required for all glazed elements to be installed are shown in the following. The performance is specified for the whole window unit, including the frame, seals, etc. as appropriate. Sole glass performance data would not demonstrate compliance with this specification.

Specification	Octave band centre frequency SRI, dB						R_w ($C;C_{tr}$), dB
	125	250	500	1k	2k	4k	
Glazing Specification 1	24	26	27	34	40	38	37 (-1;-4)
Glazing Specification 2	26	30	30	36	42	40	39 (-1;-3)
Glazing Specification 3	30	32	37	45	46	46	46 (-2;-4)

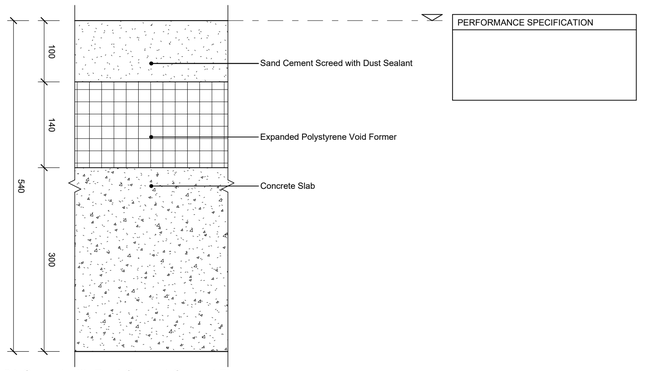
KPA Appendix B.1 - Floor Types



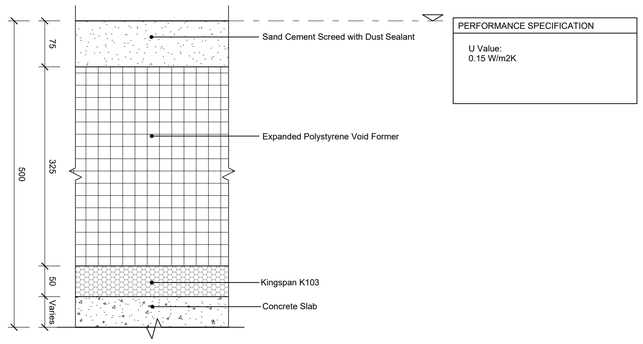
Fl.1-4 (Floors 1-8, finishes assigned by Floor Finish Plan)



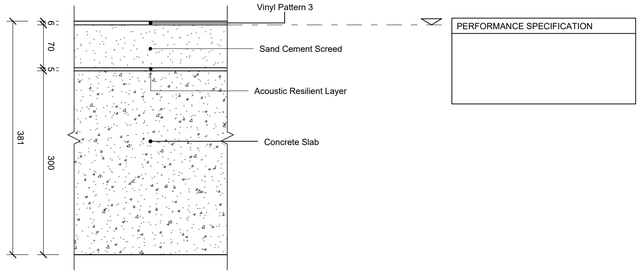
Fl.5-8 Reclaimed Parquet Flooring and Non-Slip Entrance Mat Ground Floor



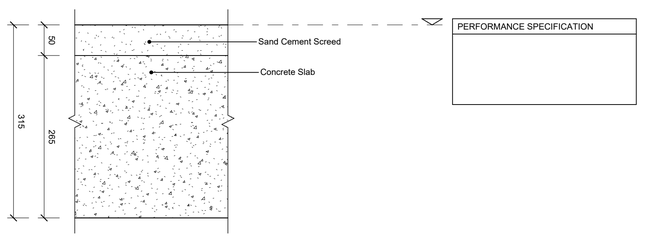
Fl.9A Screed with Dust Sealant Ground Floor



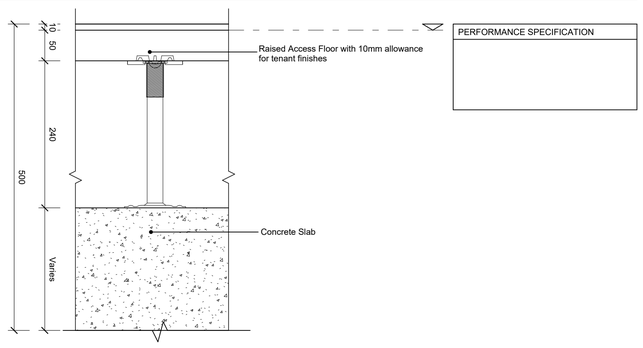
Fl.9B Screed with Dust Sealant Basement Floor



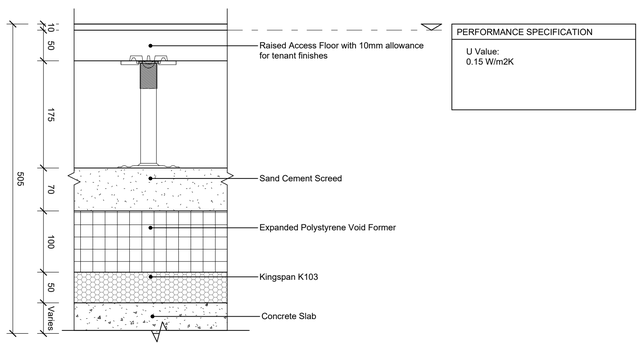
Fl.10 9th Floor



Fl.11 Substation Floor



RAF.1 Ground Floor



RAF.2 Basement Floor

Do not scale from this drawing

Floor Types Legend

- Fl.1 Carpet - Bedrooms
- Fl.2 Vinyl Pattern 1 - Bathrooms and Kitchens
- Fl.3 Vinyl Wood Effect Finish - Living Spaces
- Fl.4 Vinyl Pattern 2 - Stair and Lobby
- Fl. 5-7 Reclaimed Parquet Flooring (in patterns)
- Fl.8 None Slip Entrance Mat
- Fl.9 Floor Sealer Colour tbc
- Fl.10 Vinyl Pattern 3 - Community Room
- Fl.11 Substation Floor (Screed)
- RAF.1 Raised Access Floor on Slab
- Screed and Insulation
- RAF.2 Raised Access floor on Screed and Insulation
- Exposed Concrete Floor

Rev	Status	Description	Issued	Dwn/Chk
P1	Pr	Preliminary Issue	10.10.23	AL/AM

Client
Myco

Project No.
5361

Project
Acorn House
Gray's Inn Road
London, WC1X 8DP

Drawing
Floor Finishes
Typical Build Up

Scale	Date	Drawn	Checked
1:100@ A1	Oct'23	AL	AM

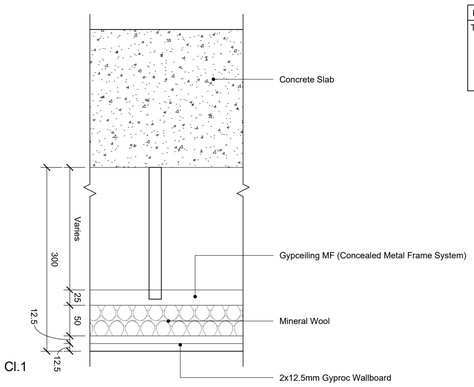
0m 2m 4m 6m 8m 10m

Visual Scale 1:100

BrookesArchitects
Unit 1 - 56 Glentham Road
London SW13 9JJ
T 020 8487 1223
www.brookesarchitects.co.uk

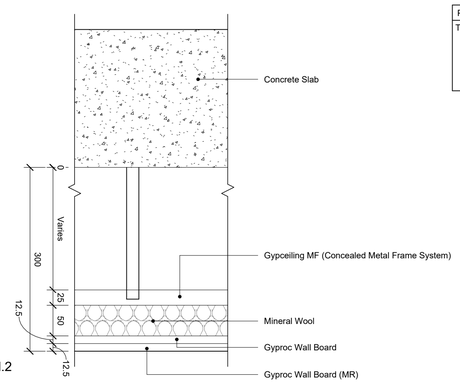
5361-BAL-XX-XX-DR-A-43-0004 | Revision P1 | Pr Status

KPA Appendix B.2 - Ceiling Types



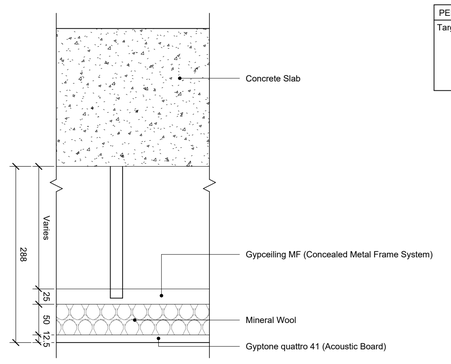
PERFORMANCE SPECIFICATION
Target sound insulation: 50dB DnT,w + Ctr

Cl.1



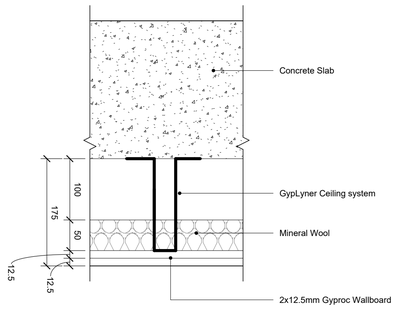
PERFORMANCE SPECIFICATION
Target sound insulation: 50dB DnT,w + Ctr

Cl.2



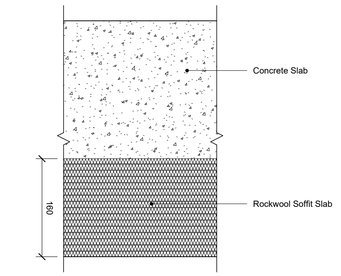
PERFORMANCE SPECIFICATION
Target sound insulation: 50dB DnT,w + Ctr

Cl.3



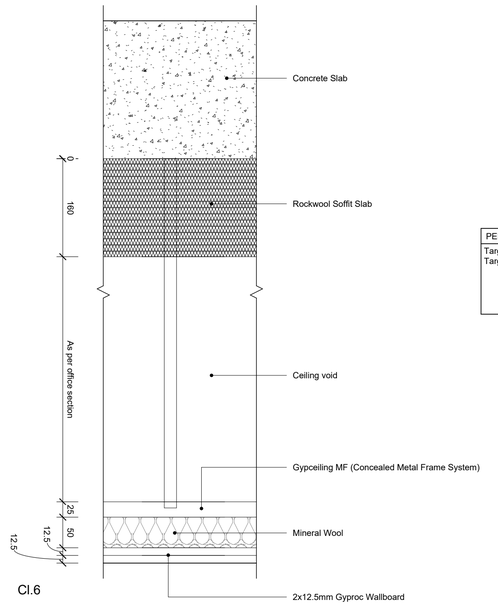
PERFORMANCE SPECIFICATION
Target sound insulation: 50dB DnT,w + Ctr

Cl. 4



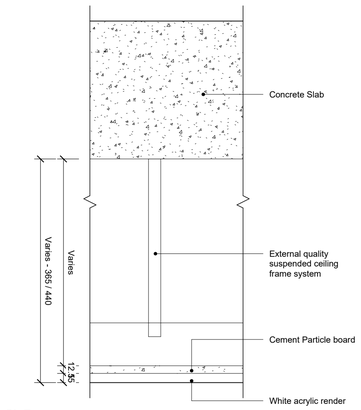
PERFORMANCE SPECIFICATION
Target U-Value: 0.2W/m²K

Cl.5



PERFORMANCE SPECIFICATION
Target U-Value: 0.2W/m²K Target sound insulation: 50dB DnT,w + Ctr

Cl.6



PERFORMANCE SPECIFICATION

Cl. 7

Do not scale from this drawing

Ceiling Types Legend

- CL.1 — Gypceiling MF Concealed system, 50mm Mineral Wool between tracks, 2x 12.5mm Gyproc Wallboard lining
- CL.2 — Gypceiling MF Concealed system, 50mm Mineral Wool between tracks, 1x 12.5mm Gyproc Wallboard lining + 1 x 12.5mm Gyproc Wallboard (MR) outer layer
- CL.3 — Gypceiling MF Concealed system + 12.5mm Gyptone quattro 41 (Acoustic Board) lining
- CL.4 — GypLyner Ceiling system with 50mm Mineral Wool (125mm void) + 2 x 12.5mm Gyproc Wallboard
- CL.5 — Rockwool Soffit Slab (Tissue Faced White)- 160mm
- CL.6 — 160mm Rockwool Soffit Slab (Foil faced) between Gypceiling MF Concealed system + 2x 12.5mm Gyproc Wallboard lining
- CL.7 — External ceiling system with 12.5mm Cement particle board and render
- Ceiling Height +2675
- Ceiling Height 2600-2675
- Ceiling Height 2400-2475
- xxxx — Ceiling height from finished floor

NOTE: To be read in conjunction with BAL drawings
5361-BAL-XX-XX-DR-A-22-0201 to 0208 and Specification 5361-BAL-XX-XX-SP-A-00-0005-P1 _Specification - Drylining (Ceilings)
- Fire rating for ceiling Type CL.3 to be confirmed by M&E Contractor - additional fire rated board may be required
-Ceiling to main landings for stair cores to be confirmed by Newlon and fire rating tbc by Building control
-White mineral-based paint to exposed concrete soffits throughout (TBC)
-Ceilings to utility cupboards may be replaced with Black mineral-based paint to exposed concrete soffit (TBC by Newlon)

PRELIMINARY

Rev	Status	Description	Issued	Dwn/Chk
P1	Pr	Preliminary Issue	17.10.23	AL/AM

Client
Myco

Project No.
5361

Project
Acorn House
Gray's Inn Road
London, WC1X 8DP

Drawing
Ceiling Types
Typial Build Ups

Scale	Date	Drawn	Checked
As indicated@A1	Oct'23	AL	AM

BrookesArchitects
Unit 1 - 56 Glentham Road
London SW13 9JJ
T 020 8487 1223
www.brookesarchitects.co.uk

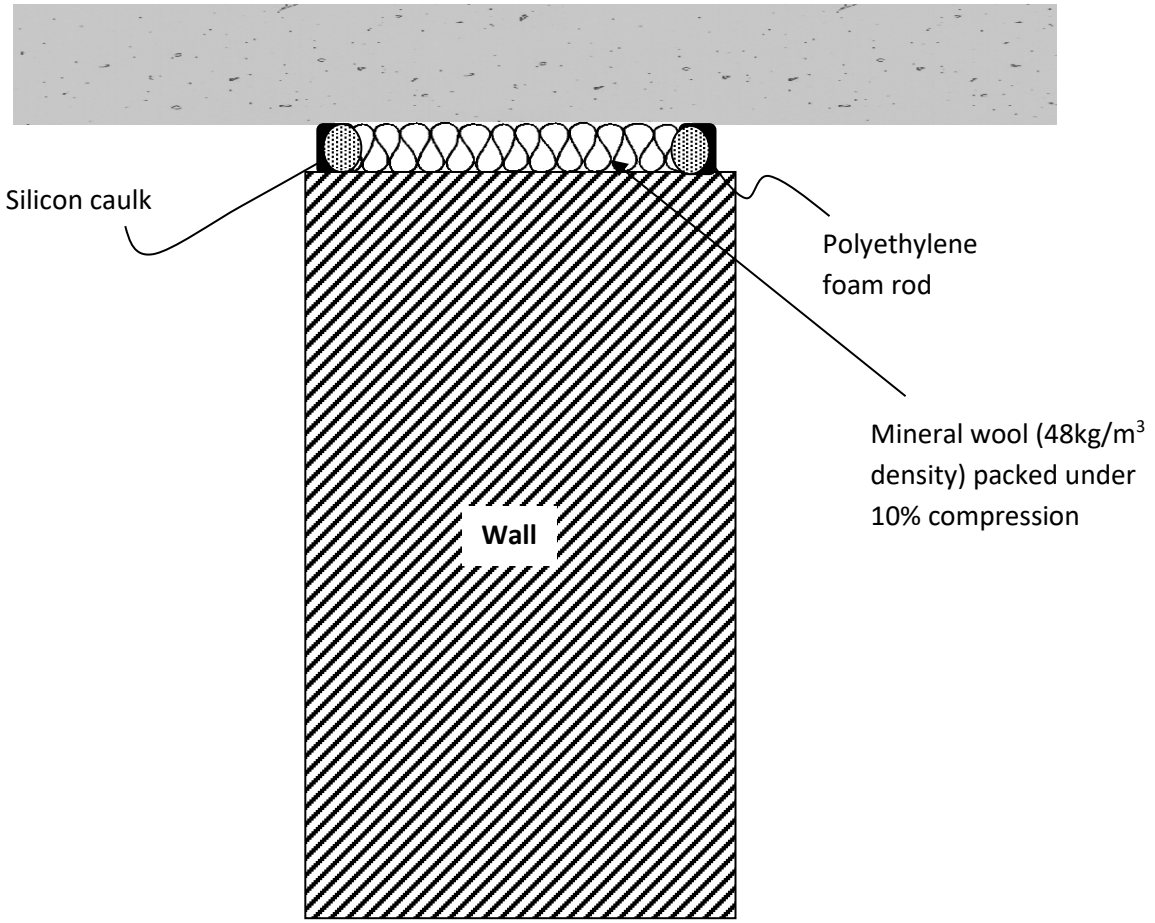
5361-BAL-XX-XX-DR-A-45-0004 — Revision P1 Pr (Status)

APPENDIX C - PLANT NOISE EMISSIONS CALCULATIONS

Source: Proposed plant	Noise level (dB) at octave band centre frequency (Hz)								
Receiver: NSR1	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Generator M138 (Sound power level), dB	79	82	79	79	89	91	85	84	95
Conversion from Lw to Lp at 1m, dB	-11	-11	-11	-11	-11	-11	-11	-11	
Correction due to 1No. surface reflections, dB	3	3	3	3	3	3	3	3	
Minimum attenuation provided by distance (1m to 22m), dB	-27	-27	-27	-27	-27	-27	-27	-27	
Correction due to building envelope, dB	-7	-8	-10	-14	-18	-22	-25	-25	
RESULTANT NOISE LEVEL, dB	37	39	34	30	36	34	25	24	40
ASHP TS-M-32 (Sound pressure level at 1m), dB	63	62	61	59	56	51	44	43	61
Quantity correction	6	6	6	6	6	6	6	6	
Conversion from Lw to Lp at 1m, dB	-11	-11	-11	-11	-11	-11	-11	-11	
Correction due to 1No. surface reflections, dB	3	3	3	3	3	3	3	3	
Minimum attenuation provided by distance (1m to 22m), dB	-27	-27	-27	-27	-27	-27	-27	-27	
Correction due to building envelope, dB	-7	-8	-10	-14	-18	-22	-25	-25	
RESULTANT NOISE LEVEL, dB	27	25	22	16	9	0	-10	-11	18
CON-09-01 (Sound power level), dB	77	76	75	73	70	65	58	57	75
CON-09-02 (Sound power level), dB	75	74	73	71	68	63	56	55	73
CON-09-03 (Sound power level), dB	71	70	69	67	64	59	52	51	69
RESULTANT NOISE LEVEL, dB	80	79	78	76	73	68	61	60	78
Conversion from Lw to Lp at 1m, dB	-11	-11	-11	-11	-11	-11	-11	-11	
Correction due to 1No. surface reflections, dB	3	3	3	3	3	3	3	3	
Minimum attenuation provided by distance (1m to 22m), dB	-27	-27	-27	-27	-27	-27	-27	-27	
Correction due to building envelope, dB	-7	-8	-10	-14	-18	-22	-25	-25	
RESULTANT NOISE LEVEL, dB	38	36	32	27	20	11	1	0	28
Twinfans EST19H & EST20H (Sound power level), dB	93	89	91	87	83	80	73	67	89
Conversion from Lw to Lp at 1m, dB	-11	-11	-11	-11	-11	-11	-11	-11	
Correction due to 1No. surface reflections, dB	3	3	3	3	3	3	3	3	
Minimum attenuation provided by distance (1m to 22m), dB	-27	-27	-27	-27	-27	-27	-27	-27	
Correction due to building envelope, dB	-7	-8	-10	-14	-18	-22	-25	-25	
Attenuation due to duct length (3m), dB	-2	-2	-1	0	0	0	0	0	
Correction due to square duct bends (1No.), dB	0	-3	-8	-5	-3	-3	-3		
Minimum attenuation required from proposed silencer, dB	0	0	0	0	0	0	0	0	
Correction due to duct end reflection, dB	-12	-8	-4	-1	0	0	0	0	
RESULTANT NOISE LEVEL, dB	37	33	33	32	27	20	10	7	32
Twinfans EST19H & EST20H (Sound power level), dB	93	89	91	87	83	80	73	67	89
Conversion from Lw to Lp at 1m, dB	-11	-11	-11	-11	-11	-11	-11	-11	
Correction due to 1No. surface reflections, dB	3	3	3	3	3	3	3	3	
Minimum attenuation provided by distance (1m to 22m), dB	-27	-27	-27	-27	-27	-27	-27	-27	
Correction due to building envelope, dB	-7	-8	-10	-14	-18	-22	-25	-25	
Attenuation due to duct length (3m), dB	-2	-2	-1	0	0	0	0	0	
Correction due to square duct bends (1No.), dB	0	-3	-8	-5	-3	-3	-3		
Minimum attenuation required from proposed silencer, dB	0	0	0	0	0	0	0	0	
Correction due to duct end reflection, dB	-12	-8	-4	-1	0	0	0	0	
RESULTANT NOISE LEVEL, dB	37	33	33	32	27	20	10	7	32
Twinfans EST19H & EST20H BREAKOUT (Sound power level), dB	80	73	84	77	73	68	59	51	79
Correction for 2No. Fans	3	3	3	3	3	3	3	3	
Conversion from Lw to Lp at 1m, dB	-11	-11	-11	-11	-11	-11	-11	-11	
Correction due to 1No. surface reflections, dB	3	3	3	3	3	3	3	3	
Minimum attenuation provided by distance (1m to 22m), dB	-27	-27	-27	-27	-27	-27	-27	-27	
Correction due to building envelope, dB	-7	-8	-10	-14	-18	-22	-25	-25	
RESULTANT NOISE LEVEL, dB	41	33	42	31	23	14	2	-6	35
RESULTS	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
TOTAL NOISE LEVEL AT RECEPTOR	46	43	44	38	37	35	25	24	42
Local Authority Criteria	-	-	-	-	-	-	-	-	≤43

APPENDIX C - PLANT NOISE EMISSIONS CALCULATIONS

Source: Proposed plant	**Noise level (dB) at octave band centre**								
Receiver: NSR2	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Generator M138 (Sound power level), dB	79	82	79	79	89	91	85	84	95
Conversion from Lw to Lp at 1m, dB	-11	-11	-11	-11	-11	-11	-11	-11	
Correction due to 1No. surface reflections, dB	3	3	3	3	3	3	3	3	
Minimum attenuation provided by distance (1m to 28m), dB	-29	-29	-29	-29	-29	-29	-29	-29	
Correction due to building envelope, dB	-7	-8	-10	-14	-18	-22	-25	-25	
RESULTANT NOISE LEVEL, dB	35	37	32	28	34	32	23	22	38
ASHP TS-M-32 (Sound power level), dB	63	62	61	59	56	51	44	43	61
Quantity correction	6	6	6	6	6	6	6	6	
Conversion from Lw to Lp at 1m, dB	-11	-11	-11	-11	-11	-11	-11	-11	
Correction due to 1No. surface reflections, dB	3	3	3	3	3	3	3	3	
Minimum attenuation provided by distance (1m to 28m), dB	-29	-29	-29	-29	-29	-29	-29	-29	
Correction due to building envelope, dB	-7	-8	-10	-14	-18	-22	-25	-25	
RESULTANT NOISE LEVEL, dB	25	23	20	14	7	-2	-12	-13	16
CON-09-01 (Sound power level), dB	77	76	75	73	70	65	58	57	75
CON-09-02 (Sound power level), dB	75	74	73	71	68	63	56	55	73
CON-09-03 (Sound power level), dB	71	70	69	67	64	59	52	51	69
RESULTANT NOISE LEVEL, dB	80	79	78	76	73	68	61	60	78
Conversion from Lw to Lp at 1m, dB	-11	-11	-11	-11	-11	-11	-11	-11	
Correction due to 1No. surface reflections, dB	3	3	3	3	3	3	3	3	
Minimum attenuation provided by distance (1m to 28m), dB	-29	-29	-29	-29	-29	-29	-29	-29	
Correction due to building envelope, dB	-7	-8	-10	-14	-18	-22	-25	-25	
RESULTANT NOISE LEVEL, dB	36	34	30	25	18	9	-1	-2	26
Twinfans EST19H & EST20H (Sound power level), dB	93	89	91	87	83	80	73	67	89
Conversion from Lw to Lp at 1m, dB	-11	-11	-11	-11	-11	-11	-11	-11	
Correction due to 1No. surface reflections, dB	3	3	3	3	3	3	3	3	
Minimum attenuation provided by distance (1m to 28m), dB	-29	-29	-29	-29	-29	-29	-29	-29	
Correction due to building envelope, dB	-7	-8	-10	-14	-18	-22	-25	-25	
Attenuation due to duct length (3m), dB	-2	-2	-1	0	0	0	0	0	
Correction due to square duct bends (1No.), dB	0	-3	-8	-5	-3	-3	-3		
Minimum attenuation required from proposed silencer, dB	0	0	0	0	0	0	0	0	
Correction due to duct end reflection, dB	-12	-8	-4	-1	0	0	0	0	
RESULTANT NOISE LEVEL, dB	35	31	31	30	24	18	8	5	30
Twinfans EST19H & EST20H (Sound power level), dB	93	89	91	87	83	80	73	67	89
Conversion from Lw to Lp at 1m, dB	-11	-11	-11	-11	-11	-11	-11	-11	
Correction due to 1No. surface reflections, dB	3	3	3	3	3	3	3	3	
Minimum attenuation provided by distance (1m to 28m), dB	-29	-29	-29	-29	-29	-29	-29	-29	
Correction due to building envelope, dB	-7	-8	-10	-14	-18	-22	-25	-25	
Attenuation due to duct length (3m), dB	-2	-2	-1	0	0	0	0	0	
Correction due to square duct bends (1No.), dB	0	-3	-8	-5	-3	-3	-3		
Minimum attenuation required from proposed silencer, dB	0	0	0	0	0	0	0	0	
Correction due to duct end reflection, dB	-12	-8	-4	-1	0	0	0	0	
RESULTANT NOISE LEVEL, dB	35	31	31	30	24	18	8	5	30
Twinfans EST19H & EST20H BREAKOUT (Sound power level), dB	80	73	84	77	73	68	59	51	79
Correction for 2No. Fans	3	3	3	3	3	3	3	3	
Conversion from Lw to Lp at 1m, dB	-11	-11	-11	-11	-11	-11	-11	-11	
Correction due to 1No. surface reflections, dB	3	3	3	3	3	3	3	3	
Minimum attenuation provided by distance (1m to 28m), dB	-29	-29	-29	-29	-29	-29	-29	-29	
Correction due to building envelope, dB	-7	-8	-10	-14	-18	-22	-25	-25	
RESULTANT NOISE LEVEL, dB	39	31	40	29	21	12	0	-8	33
RESULTS	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
TOTAL NOISE LEVEL AT RECEPTOR	44	40	41	36	35	33	23	22	40
Local Authority Criteria	-	-	-	-	-	-	-	-	≤40



Title:

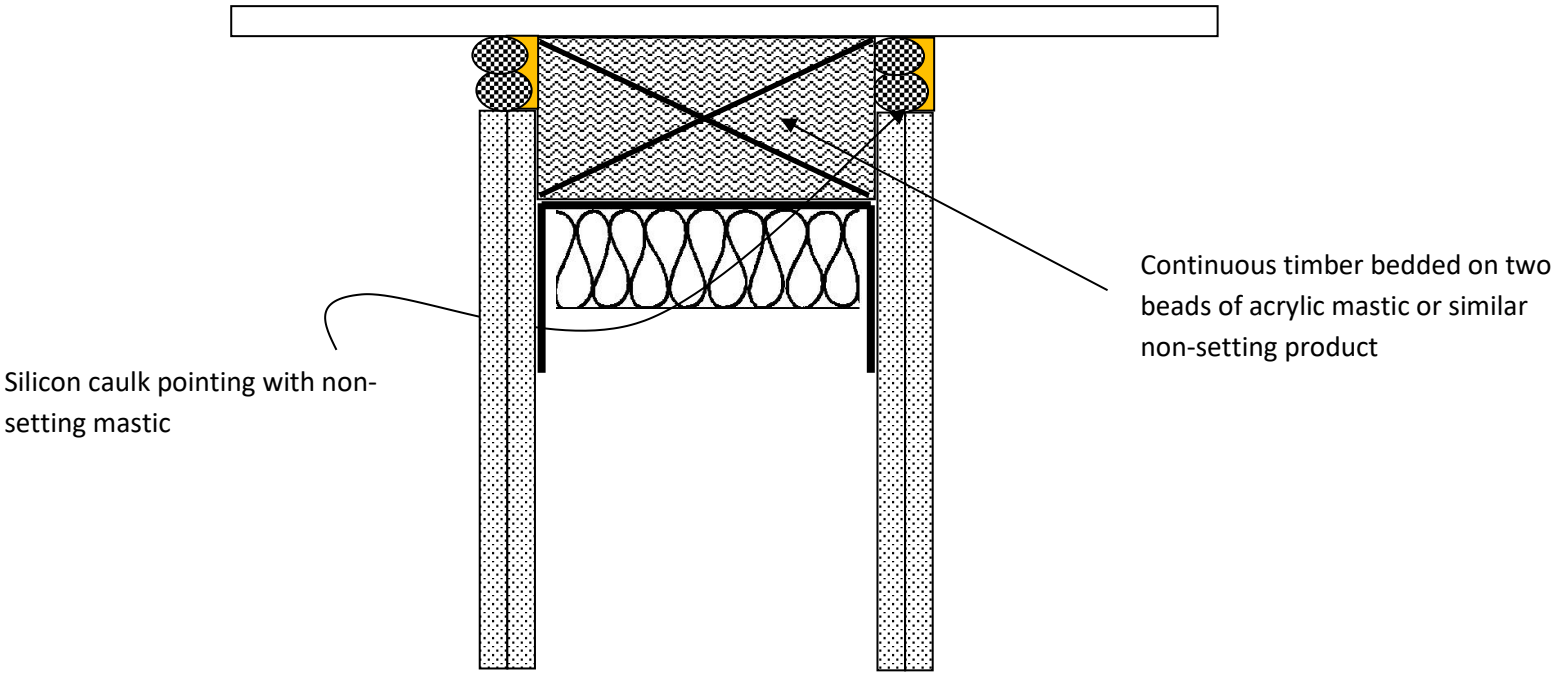
Deflection Head Detail

Date: 07 December 2023

Revision: -

FIGURE 26359.DWG1

KP acoustics



Title:

Deflection Head Detail

Date: 07 December 2023

Revision: -

FIGURE 26359.DWG2

KP acoustics