Technical Submittal Form

To: (Name)	Frank Harding	**From:** (Name)	Lewis Gardner
Company:	ISG	**Company:**	MCS
Project Name:	Facebook	**Company Initials:**	MCS
Job No:	1901	**Role:**	X: Subcontractor
Submission Date:	2020-05-28	**Package Code:**	6000: Mechanical
Date Approval is Required:	2020-06-02	**Revision:**	P02
Submittal No:	**1901-MCS-XX-XX-TS-X-0067**		

Description of Technical Submittal		
System Category	Group:	Ventilation and air conditioning systems *(Ss_65)
	Subgroup:	Ventilation systems *(Ss_65_40)
	Section:	General space ventilation systems *(Ss_65_40_33)
	Object:	Natural ventilation systems *(Ss_65_40_33_56)
Product Category	Group:	Services distribution products *(Pr_65)
	Subgroup:	Air and fume distribution products *(Pr_65_67)
	Section:	Sound attenuators *(Pr_65_67_78)
	Object:	Rectangular attenuators *(Pr_65_67_78_72)

Equipment Type (Fan Coil Unit, Radiator etc)	Main Plant Attenuators
System Abbreviation	ATT: Attenuator
Manufacturer	Caice
Model	SG01V/3C/L/S, SG01V/3C/L/SM, LG01H/3C/L/S, PG01U/1K/L/
Drawing No	1901-5701 / M1 / 11 / 21 / 31
Specification reference	1901 Facebook Brock Street Level B,G,M, 1 to 3 - Mechanical & Public Health Services - C1

Description or additional information:
Technical submittal for the proposed new Main Plant Attenuators to be installed across the project.

Updated following revised Kitchen Extract Air Flow Rate

Is the proposal specification compliant?	Yes
Is the proposal an alternative to specification?	No
Is the proposal compliant with employer's requirements?	Yes

Details of reason for deviation from specification / alternative to specification:
N/A

ISG / Consultant's comments:

Designated Consultant to co-ordinate response from all parties

Organisation	Copied to	Comments

Template revised on: 2019-05-20 Based on Uniclass 2015 V1.6

Technical Submittal Form

Consultant	Approval Status	Signed	Date
	A B C		

Status A

Mr Lewis Heard - Axis M&E Design Engineering UK Ltd

May 29, 2020, 3:18 PM GMT+1:00

STATUS "A"

FIT FOR CONSTRUCTION

DRAWING/ DOCUMENT RETURNED WITH NO COMMENTS. THE CONTRACTOR MAY PROCEED WITH THE WORKS BASED ON THE DETAILS DEPICTED ON THE DRAWING.
EXAMINATION OF SUBMITTALS SHALL NOT BE DEEMED TO REMOVE ANY DUTIES, OBLIGATIONS AND RESPONSIBILITIES UNDER THE CONTRACT.

Supplier		
Supplier Name		Caice Acoustic Air Movement Ltd.
Supplier Telephone		0118 918 6470
Supplier Address	Building Name / №	Riverside House, 3 Winnersh Fields
	Street	Gazelle Close
	Town	Winnersh
	County	Wokingham
	Postcode	RG41 5QS
	Country	United Kingdom
Supplier Email		enquiries@caice.co.uk
Supplier Website		www.caice.co.uk

Warranty	
Manufacturer's Warranty Description	Parts only
Manufacturer's Warranty Duration for Parts	1 Year
Manufacturer's Warranty Duration for Labour	1 Year
Contractual Warranty Duration	1 Year
Estimated Life Expectancy	15 Years
Warranty Service Contractor Email	enquiries@caice.co.uk
Warranty Service Contractor Website	www.caice.co.uk

Sustainability

The table below provides LEED prompts dependant on the item selected from the drop down menu. This table must be read alongside the package LEED scope. It is not an exhaustive list and as such it is up to the subcontractor to confirm ultimate compliance against their package scope.

Estimated annual CO_2 emissions ($kgCO_2$/year)	N/A

LEED

Is this technical submission for the following equipment / materials:	If yes, please prove the following is met and provide auditable documentation:	Included?	Please explain where compliance is shown within the supplied documentation
Not listed above	N/A	N/A	N/A
	N/A	N/A	N/A
	N/A	N/A	N/A
	N/A	N/A	N/A
	N/A	N/A	N/A
	N/A	N/A	N/A
	N/A	N/A	N/A
	N/A	N/A	N/A
	N/A	N/A	N/A
	N/A	N/A	N/A
	N/A	N/A	N/A
	N/A	N/A	N/A

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Technical Submittal Form

Maintenance Schedule	
Maintenance Action (per item)	**Frequency**
N/A	Reactive maintenance only
N/A	Reactive maintenance only
N/A	Reactive maintenance only
N/A	Reactive maintenance only
N/A	Reactive maintenance only
N/A	Reactive maintenance only
N/A	Reactive maintenance only
N/A	Reactive maintenance only
N/A	Reactive maintenance only
N/A	Reactive maintenance only

Models / Types / Sub-models / Sizes			
1:	SG01V/3C/L/S	**16:**	
2:	SG01V/3C/L/SM	**17:**	
3:	LG01H/3C/L/S	**18:**	
4:	PG01U/1K/L/	**19:**	
5:		**20:**	
6:		**21:**	
7:		**22:**	
8:		**23:**	
9:		**24:**	
10:		**25:**	
11:		**26:**	
12:		**27:**	
13:		**28:**	
14:		**29:**	
15:		**30:**	

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11473 Facebook L00-03 ATT Schedule R6

Att Ref.	System	Air Volume L/S	Pressure Drop Pa	Width or Diameter	Length	Height	Flange Connections	Quantity	Notes
ATT/M/01	Kitchen AHU Fresh Air Intake	9995	47	1600	2100	1000	Yes	1	Sized to suit ductwork connections shown on schematic - differs to Axis schedule
ATT/M/02	Kitchen AHU Supply Air	9995	47	1600	2100	1000	Yes	1	Sized to suit ductwork connections shown on schematic - differs to Axis schedule
ATT/M/03	Events Space North AHU Fresh Air Intake	1200	<5	1400	1200	680	Yes	1	Sized to suit Axis Schedule
ATT/M/04	Events Space North AHU Exhaust Air	1200	<5	950	1200	950	Yes	1	Sized to suit Axis Schedule
ATT/M/05	Events Space North AHU Supply Air	1200	<5	600	1000	600	Yes	1	Sized to suit Axis Schedule - Ductwork prior to be acoustically lagged
ATT/M/06	Events Space North AHU Extract Air	1200	<5	600	1000	600	Yes	1	Sized to suit Axis Schedule - Ductwork prior to be acoustically lagged
ATT/M/07 A	Events Space South AHU Fresh Air Intake	2400	17	1000	1200	500	Yes	1	Sized to suit ductwork, needs to be as short as possible to aid co-ordination
ATT/M/08 A	Events Space South AHU Exhaust Air	2400	<5	1750	1200	860	Yes	1	Sized to suit AHU opening, needs to be as short as possible to aid co-ordination
ATT/M/09 A	Events Space South AHU Supply Air	2400	28	700	1500	700	Yes	1	Sized to suit ductwork, needs to be as short as possible to aid co-ordination
ATT/M/10 A	Events Space South AHU Extract Air	2400	28	700	1500	700	Yes	1	Sized to suit ductwork, needs to be as short as possible to aid co-ordination
ATT/M/11 A	Toilet Extract Fan	380	0	355	615		No	2	Sized to suit ductwork, needs to be as short as possible to aid co-ordination
ATT/10/01	Kitchen Extract Fan	12550	42	1300	900	1300	Yes	2	Unable to source spiral attenuator larger than 1000mm Dia, so sized selected based on airflow - Not shown on Axis Schedule

caicedesign
The complete acoustic design service

caice

Maintenance And Contracting Services Ltd
Unit 14 The Alpha Centre
Armstrong Way
Yate
Bristol
United Kingdom
BS37 5NG

Our Reference
98885/2/17/2

Subject
Facebook Brock Street
Phase 2

27 May 2020

For the attention of Sean Nutley,

Further to your recent enquiry with regard to the above project, we have pleasure in submitting our Attenuator technical submittal for your consideration.

Enquiry Data

Our selections are based generally upon the following information provided to us by yourselves:

- Specification sections : Not issued
- Schedule numbers : 11473 Facebook L00-03 - R5
As per your email, 22nd May 2020
- Drawing numbers : Not issued

General Note

The attenuators selected will require checking against finalized drawings and plant noise levels to ensure compliance with the specified noise criteria.

We trust the enclosed meets with your approval, however should you require any further details or clarification then please do not hesitate to contact us.

Yours faithfully,

Stephanie Lawton
Trainee Operations Support Coordinator
Direct Dial 01756 708760
E-Mail stephanie.lawton@caice.co.uk

Cc:

Lewis Gardner, Maintenance And Contracting Services Ltd

Telephone
0118 918 6470
Facsimile
0118 918 6480

enquiries@caice.co.uk
www.caice.co.uk

Caice Acoustic Air Movement Ltd.
Riverside House
3 Winnersh Fields
Gazelle Close
Winnersh
Wokingham
RG41 5QS

Registered office and head office

Company Registration Number
2790667
VAT Registration Number
GB614683632

Attenuator Schedule

Notes

1. Attenuators supplied by Caice.
2. Pressure losses are stated in accordance with ISO 7235, which is based on laminar airflow conditions. The system designer shall make allowance for increased attenuator pressure losses where turbulent airflow conditions exist on the attenuator entry or exit.
3. Unless stated otherwise all attenuators shall be constructed as follows: Galvanised sheet steel casings with 30mm profile flanges that are fully compliant with DW/TM1 at a high pressure rating (+2000/-750Pa). Profile flanges shall be compatible with Doby, Mez & Metu flanging systems. Elements shall be installed in the vertical plane, with side elements provided as standard, and all elements shall have aerodynamic inlet and outlet fairings. Element facings shall be constructed from expanded galvanised steel mesh with fibre glass tissue bonded to the inner face. Mineral wool infill shall be overpacked to minimise voids due to settlement. Attenuator ends shall be protectively wrapped, and all attenuators shall be delivered to site on pallets and individually labelled.

Ref.	Description	Type and Model Code	Dimensions (mm)			Free Area	Vol (m^3/s)	PL (Pa)	Qty	Features
			W	H	L					
ATT/M/01	KITCHEN AHU FAI	Rectangular SG01V/3C/L/S	1600	1000	2100	50	10.00	47	1	
ATT/M/02	KITCHEN AHU SUP	Rectangular SG01V/3C/L/S	1600	1000	2100	50	10.00	47	1	
ATT/M/03	E-SPACE NORTH AHU FAI	Rectangular SG01H/3C/L/S	1400	680	1200	40	1.20	3	1	Horizontal elements.
ATT/M/04	E-SPACE NORTH AHU EXH	Rectangular SG01V/3C/L/S	950	950	1200	57.5	1.20	2	1	
ATT/M/05	E-SPACE NORTH AHU SUP	Rectangular SG01V/3C/L/S	1000	600	600	45	1.20	5	1	
ATT/M/06	E-SPACE NORTH AHU EXT	Rectangular SG01V/3C/L/S	1000	600	600	45	1.20	5	1	
ATT/M07A	E-SPACE SOUTH AHU FAI	Rectangular LG01H/3C/L/S	1000	500	1200	60	2.40	17	1	Horizontal elements.
ATT/M08A	E-SPACE SOUTH AHU EXH	Rectangular SG01H/2C/L/S	1750	860	1200	60	2.40	2	1	Horizontal elements. Medium pressure rating (+1000/-750Pa).
ATT/M09A	E-SPACE SOUTH AHU SUP	Rectangular LG01V/3C/L/S	700	700	1500	50	2.40	28	1	
ATT/M10A	E-SPACE SOUTH AHU SUP	Rectangular LG01V/3C/L/S	700	700	1500	50	2.40	28	1	
ATT/M11A	TOILET EXTRACT	Circular PG01U/1K/L/	355	dia	615	100	0.38	0	2	Un-podded. 38mm long spigots. Low pressure rating (+500/-500Pa).

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Direct E-Mail stephanie.lawton@caice.co.uk

Attenuator Schedule

Ref.	Description	Type and Model Code	Dimensions (mm)			Free Area	Vol (m^3/s)	PL (Pa)	Qty	Features
			W	H	L					
AT/10/01	KITCHEN EXTRACT FAN	Rectangular SG01V/3C/L/SM	1300	1300	900	57.5	12.55	42	2	Melinex wrapped infill.

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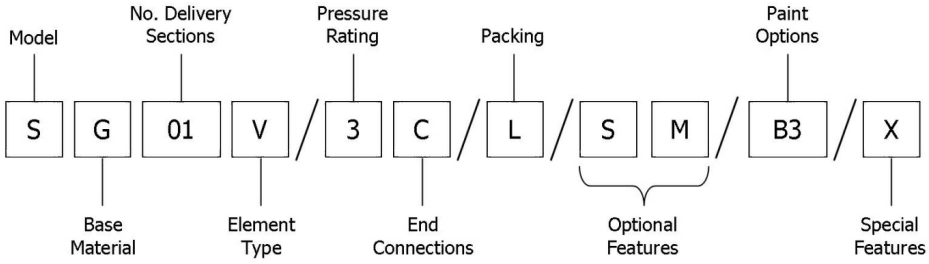
Attenuator Construction Code Definitions

Project: Facebook Brock Street Phase 2 Date: 27/05/2020

Sample Construction Code Format Diagram



Construction Code Definitions

Code Section	Code	Description
Model	L	Rectangular attenuator with LINING elements
	P	CIRCULAR attenuator with plain wrap casing
	S	Rectangular attenuator with SPLITTER elements
Base material	G	Standard gauge galvanised sheet steel
No. delivery sections	01 upwards	This number confirms how many sections will be delivered to site for each attenuator or splitter. For 02 or above assembly will be required by others
Element type	H	Elements installed in the horizontal plane
	U	Un-podded (circular attenuators only)
	V	Elements installed in the vertical plane
Pressure rating	1	Low pressure (+500/-500Pa)
	2	Medium pressure (+1000/-750Pa)
	3	High pressure (+2000/-750Pa)
End connections	C	30mm profile flanges (profile flanges are compatible with Doby, Mez & Metu flanges)
	K	38mm long circular spigots (circular attenuators only)
Packing	L	Lightweight pallet wrapping on casing ends (EG/IG units are palletised and wrapped on the pallet)
Optional features	M	Infill protected by Melinex polyester film
	S	Side elements (for EG/IG units these are supplied with steel backing)

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Attenuator Drawings

Project: Facebook Brock Street Phase 2 Date: 27/05/2020

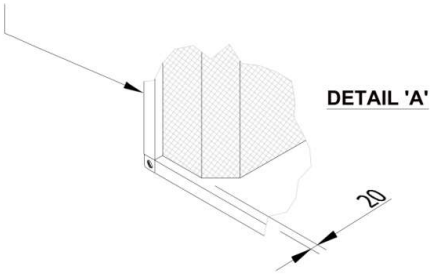
Construction Codes confirm the physical properties of each item. This drawing must therefore be read in conjunction with the Construction Code Definitions.
Dimensions W1, H1, W2, H2, WD1, HD1 are always shown as "inside-duct". Dimensions L1, L2, LD1 are always shown as "over connections".

LG lining attenuator - with profile flanges

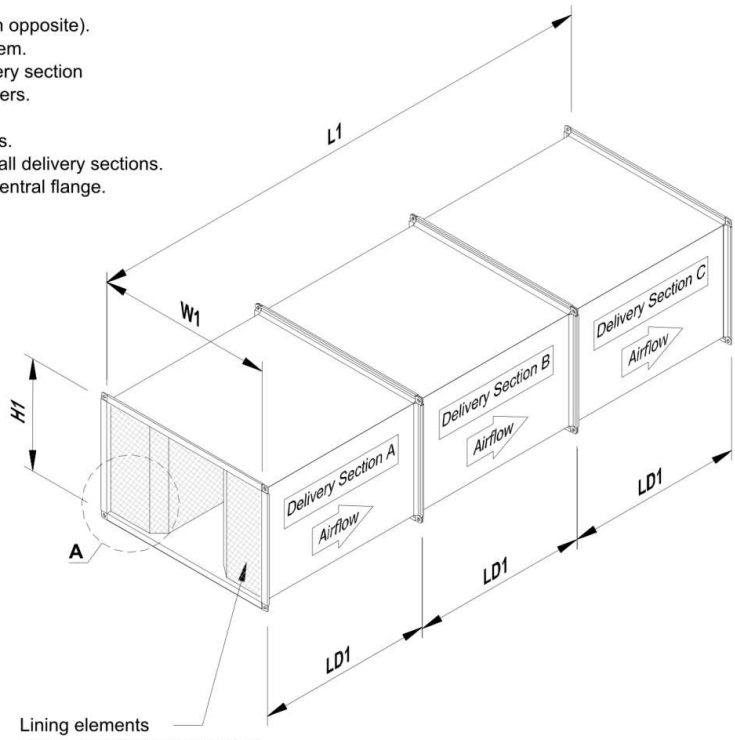
Notes:

1. Attenuators may be delivered in 1, 2, 3 or 4 sections in length (3 shown opposite).
2. See **NDL** in table below for number of delivery sections in length per item.
3. Assembly of multiple piece items must be in accordance with the delivery section and airflow label layouts, typically as shown opposite. Assembly by others.
4. Nuts, bolts, flange clamps and gasket between flanges by others.
5. Delivery section and airflow labels only provided on multiple piece items.
6. Identification labels stating item reference and description provided on all delivery sections.
7. Where **LD1** exceeds 1250 each delivery section has an intermediate central flange.
8. All dimensions in mm.
9. Tolerances on **W1** & **H1** +/- 2mm.
10. Tolerances on **LD1** +/- 3mm

Profile flanges suitable for MEZ, DOBY or METU flanging systems. See table below for flange size.



Lining elements set back in casing by 20mm and provided with aerodynamic fairings on inlet and outlet as shown. However if item has non-standard elements refer to Attenuator Model Code Definitions for details.



Lining elements shown installed in the vertical plane. Refer to item Model Code for actual orientation.

Ref.	Construction Code	Primary Dimensions W1	H1	L1	Delivery Data LD1	NDL	Flange Size	Paint Colour	Wt (Kg)	No. Off
ATT/M07A	LG01H/3C/L/S	1000	500	1200	1200	1	30mm		54	1
ATT/M09A	LG01V/3C/L/S	700	700	1500	1500	1	30mm		70	1
ATT/M10A	LG01V/3C/L/S	700	700	1500	1500	1	30mm		70	1

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Attenuator Drawings

Project: Facebook Brock Street Phase 2 Date: 27/05/2020

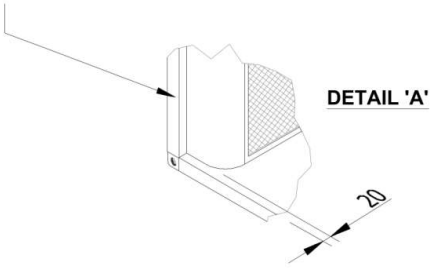
Construction Codes confirm the physical properties of each item. This drawing must therefore be read in conjunction with the Construction Code Definitions.
Dimensions W1, H1, W2, H2, WD1, HD1 are always shown as "inside-duct". Dimensions L1, L2, LD1 are always shown as "over connections".

SG splitter attenuator - with profile flanges

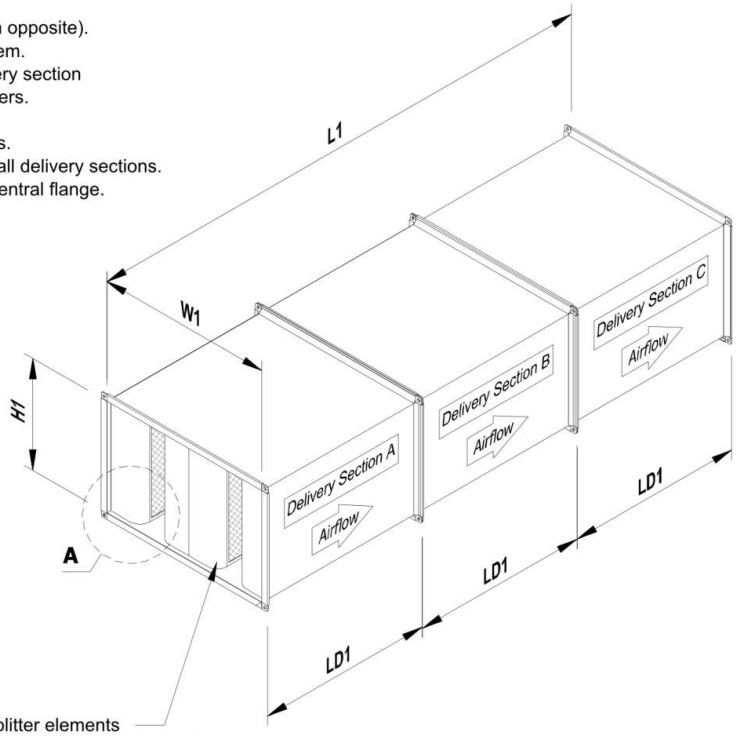
Notes:

1. Attenuators may be delivered in 1, 2, 3 or 4 sections in length (3 shown opposite).
2. See **NDL** in table below for number of delivery sections in length per item.
3. Assembly of multiple piece items must be in accordance with the delivery section and airflow label layouts, typically as shown opposite. Assembly by others.
4. Nuts, bolts, flange clamps and gasket between flanges by others.
5. Delivery section and airflow labels only provided on multiple piece items.
6. Identification labels stating item reference and description provided on all delivery sections.
7. Where **LD1** exceeds 1250 each delivery section has an intermediate central flange.
8. All dimensions in mm.
9. Tolerances on **W1** & **H1** +/- 2mm.
10. Tolerances on **LD1** +/- 3mm

Profile flanges suitable for MEZ, DOBY or METU flanging systems. See table below for flange size.



Splitter elements set back in casing by 20mm and provided with aerodynamic bullnoses on inlet and outlet as shown. However if item has non-standard elements refer to Attenuator Model Code Definitions for details.



Splitter elements shown installed in the vertical plane. Refer to item Model Code for actual orientation.

Ref.	Construction Code	Primary Dimensions			Delivery Data		Flange Size	Paint Colour	Wt (Kg)	No. Off
		W1	H1	L1	LD1	NDL				
ATT/M/01	SG01V/3C/L/S	1600	1000	2100	2100	1	30mm		225	1
ATT/M/02	SG01V/3C/L/S	1600	1000	2100	2100	1	30mm		225	1
ATT/M/03	SG01H/3C/L/S	1400	680	1200	1200	1	30mm		95	1
ATT/M/04	SG01V/3C/L/S	950	950	1200	1200	1	30mm		92	1
ATT/M/05	SG01V/3C/L/S	1000	600	600	600	1	30mm		44	1
ATT/M/06	SG01V/3C/L/S	1000	600	600	600	1	30mm		44	1
ATT/M08A	SG01H/2C/L/S	1750	860	1200	1200	1	30mm		115	1
AT/10/01	SG01V/3C/L/SM	1300	1300	900	900	1	30mm		103	2

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Attenuator Drawings

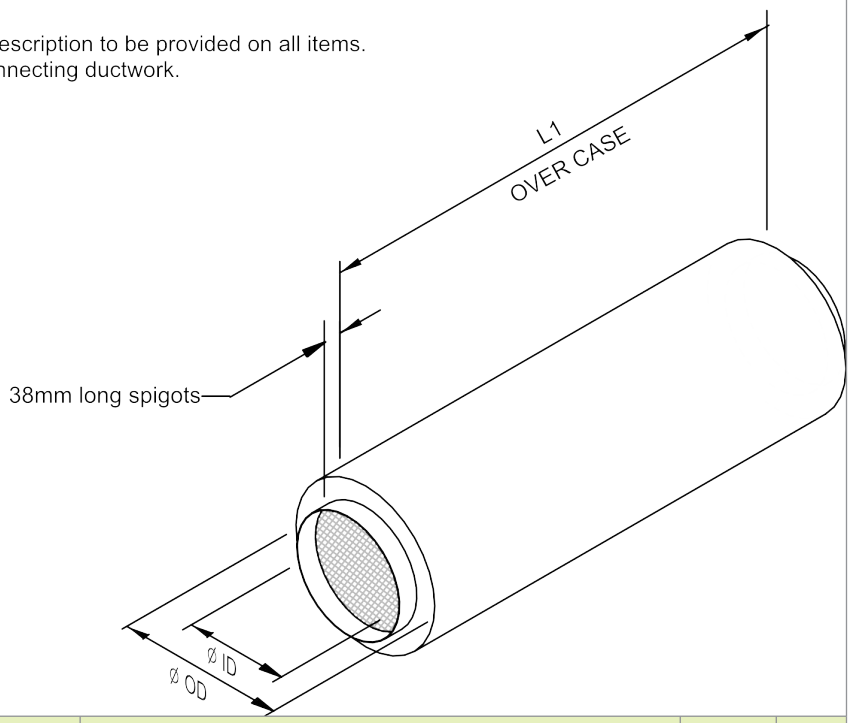
Project: Facebook Brock Street Phase 2 Date: 27/05/2020

Construction Codes confirm the physical properties of each item. This drawing must therefore be read in conjunction with the Construction Code Definitions.
Dimensions W1, H1, W2, H2, WD1, HD1 are always shown as "inside-duct". Dimensions L1, L2, LD1 are always shown as "over connections".

PG circular attenuator - with spigot ends

Notes:

1. Identification labels stating item reference and description to be provided on all items.
2. Attenuator spigots shall be slip jointed inside connecting ductwork.
3. All dimensions in mm.
4. Tolerance on L1 +/- 2mm
5 Tolerance on ID +/- 2mm



Ref.	Construction Code	Primary Dimensions ID	OD	L1	Paint Colour	Wt (Kg)	No. Off
ATT/M11A	PG01U/1K/L/	355	460	615		13	2

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Document Ref: 98885/2/17/2 27 May 2020

Re: Facebook Brock Street Phase 2

Product Specification

Specification for Attenuators

Rectangular attenuator casings are constructed from galvanised sheet steel, and comply with the flange deflection limits and air leakage rates as specified with DW/TM1 for class A low pressure systems (+/-500Pa), Class B medium pressure systems (+1000/-750Pa) or Class C high pressure systems (up to +2000/-750Pa), as required by the project specification.

Standard end connections are profile flanges compatible with Doby, Mez or Metu systems. Profile flanges are formed from the parent metal of the casing, and each flange corner is fitted with a one or two-piece flange corner.

Longitudinal joints for all rectangular casings are made using the Pittsburgh Seam method, which provides a firm mechanical joint. High-pressure duct sealant is then applied inside the casing along the length of each seam, and behind each flanged corner that coincides with a seam, to provide an airtight seal.

Internal splitters are fitted into the attenuator casings. Each splitter has a four part peripheral frame comprising a top and bottom channel, and nose sections at each end. The nose sections are "bullnoses" i.e. having an aerodynamically rounded profile at both ends. The channel and nose parts are constructed from galvanised sheet steel. Side splitters are provided as standard.

The splitters are packed with controlled density acoustic media (mineral wool) having a nominal density of 28kg/m3. This is retained within the peripheral frame by a splitter facing, which is constructed from galvanised expanded steel mesh (XPM). Fibreglass tissue is bonded to the rear of the facing to reduce fibre egress from the infill. Alternatively the infill can be wrapped and sealed in Melinex polyester film, to provide additional protection where required. Smaller attenuators will be fitted provided with internal attenuator side linings only, manufactured from galvanised expanded steel mesh.

Above certain dimensional parameters, attenuators will be provided in modular form. Casings can be joined in width, height or length to form the final assembly sizes. For units split in width or height, this is achieved by fitting modular rails on the outside of each case in appropriate locations, and then by using a range of brackets and other fixings the modular rails can be joined, which thereby joins the casings. The modular rails are fitted longitudinally along the case, wherever an adjacent casing is to be joined as part of the assembly. They are also fitted on the underside of the bottom casings within the assembly to act as a bearing surface for support or lifting.

Attenuators will be provided to site with the casing ends wrapped in lightweight plastic film, which is taped in place where required.

Circular attenuators are manufactured to similar specifications, with either plain spigot end connections or threaded inserts, depending on unit size. A central acoustic pod may be provided depending on acoustic performance requirements.

Caice/Flameshield Fire Rated Attenuators

Caice/Flameshield fire rated attenuators are in full compliance with Flameshield test certification, and have the same flange sections which make the attenuators fully compatible with the Flameshield range of fire rated ductwork.

Flameshield range of non coated fire rated ductwork has been successfully tested at the BRE (Building Research Centre) in accordance with the requirements of BS 476 Part 24 for both Duct A (fire outside) and Duct B (fire inside). The numbers of tests successfully concluded at the BRE test centre have been followed by various assessments and tests. All of these tests and assessments have resulted in Flameshield achieving a fire rated duct system suitable for both fire inside and fire outside situations for periods up to 4 hours stability/integrity and 2 hours insulation. The system has also been assessed as being suitable for smoke extract systems for a period of up to 2 hours (maintains 75% of its shape in full furnace conditions).

Flameshield products are suitable for use in all types of systems which include, smoke extract, general ventilation, kitchen extract, dishwasher extract and stair pressurisation. Following full BS 476 Part 24 approval, in 2006 Flameshield received LPCB (Loss Prevention Certification Board) accreditation for the product itself (ensuring full compliance with the requirements of BS 476 Part 24) and LPCB ISO 9001:2000 accreditation for the manufacture and installation of Flameshield fire rated ductwork. LPCB accreditation has resulted in Flameshield fire rated ductwork becoming the only non coated product being included within the LPCB “Red Book” Volume 1: List of Approved Fire & Security Products and Services.