VIRTUS

LONDON 14

Prologis Park

Weather Louvres

Technical Submission to:

Virtus

By: Caice

Bouygues Energies & Services

Reference: 551060.01 – TS004 – Louvres

Revision 1

APPROVAL

Revision	Description	Issued by	Date	Checked
1	1st edition	BB	30/06/2023	BB

CONTENTS

LOADING BAY SCISSOR LIFTING PLATFORM

1 DESIGN PARAMETERS

External metal acoustic louvres to chiller plant including high level columns and secondary steelwork support; Pre-galvanised mild steel; Polyester powder coated finish; Double banked louvre blade; Semi-aerofoil shaped profile; fixed to perimeter of plant gantry structure.

System outline

25-55-45/150 Louvre screen system

- Description: Horizontal Louvred Screens to gantry
- System performance: 25-55-45/205 Compliance with performance requirements and 25-55-45/220 Durability. ·
- System manufacturer: Caice Ltd.
- Manufacturer reference: PLS 100 Louvre System
- Screen framing: Aluminium mullions to the rear of the louvres.
- Louvres: -
    - Type: 45-25-50/360 Aluminium louvre blades.
    - Operation: Fixed. ·
- Installation fasteners: Manufacturer's standard.
- System accessories: 45-25-50/335 Screening and ventilation louvre access doors. ·

2 DESCRIPTION & CONSIDERATIONS IN SELECTION OF UNIT

Products

25-55-45/305 Product samples

25-55-45/150 Louvre screen system type A and type B.

- Manufacturer: Caice Ltd.
- Submittals: Samples of all profiles and finishes.
- Purpose: To demonstrate compliance with performance requirements.
- For aesthetic evaluation.
- Labelling: Clearly label all submitted samples.
- Timing: Before ordering for project.

45-25-50/335 Screening and ventilation louvre access doors

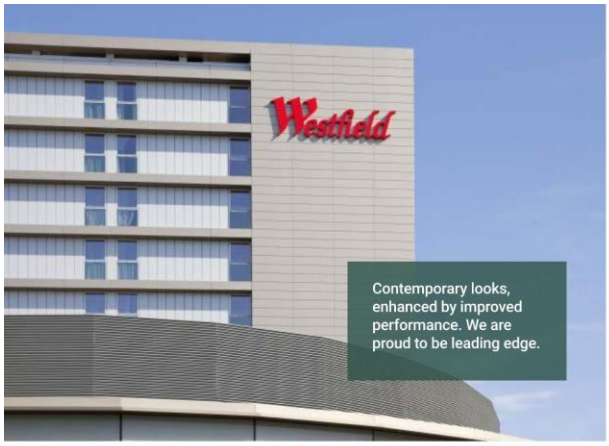
- Manufacturer: Caice Ltd.
- Size: 1000 x 2100
- Format: Single leaf, single action.
- Material: Manufacturer's standard.
- Finish: To match surrounding louver screens
- Colour: To match surrounding louver screens

Aluminium louvre blades

- Shared by: 25-55-45/150 Louvre screen system type A and type B.
- Manufacturer: Caice Ltd.
- Profile: PLS 100 Louvre System (Type A)
- Material: Extruded aluminium alloy perforated plain sheet, to BS EN 755-1.
- Finish: Powder coating to BS 6496.
- Colour: To be confirmed
- Texture: Matt.
- Mounting arrangement: Clip fixing to mullions.

caice

caice.co.uk



Our **distinctive & efficient** Weather Louvre system

Aerodynamic with high resistance to weather that's easy to assemble with our optional integrated steel work support system.

Visually attractive and versatile

Enhance your buildings appeal with our distinctive weather louvres disguising your unsightly plant. Balancing weather efficiency with aerodynamic performance protects your ventilation openings.

Being the only company in the UK that manufactures Weather Louvres, Continuous Line Acoustic Louvres and Attenuators in-house we will recommend the best performing and most cost efficient solution for your project.

One multi-purpose system with many applications

Weather Louvre applications include: fresh air intakes and exhausts for ventilation systems, mechanical equipment screens or enclosures, natural ventilation and façade cladding, all providing a seamless look wherever they are used.

For a totally individual appearance, the Weather Louvres are fabricated from extruded aluminium and can be finished in polyester powder paint to a wide range of RAL colours.

100%

Be 100% confident in the quality and performance of our products

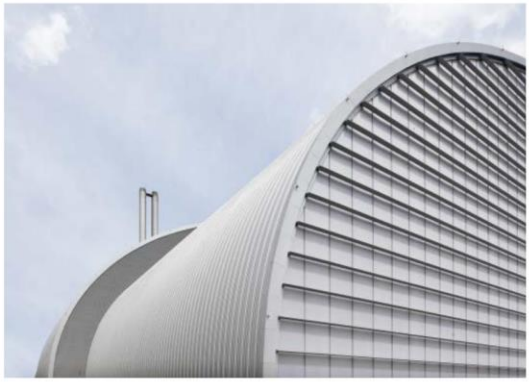
You can be confident in our performance testing

We like to do things properly and our Weather Louvre range has therefore been rigorously tested to offer performance data that you can trust. Applicable standards -

Rain Penetration, Pressure Drop and Coefficient of Entry – BS EN ISO 13030: 2001 (BSRIA). More detail on this test standard is available upon request.

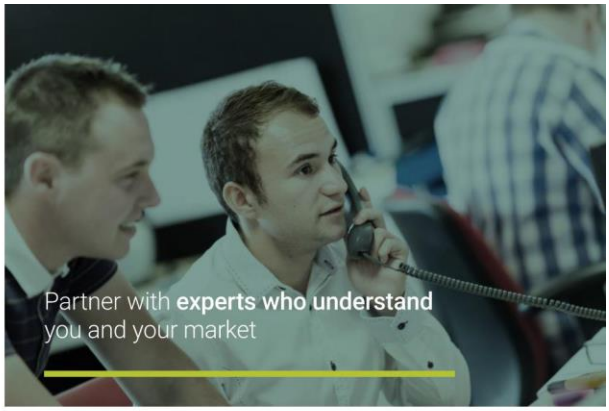
Class A rainwater penetration

Rainwater will penetrate into a building through standard Weather Louvres. So we have developed a high performance option to achieve Class A rainwater penetration when tested at BSRIA (99% effective at 2.5m/s face velocity).



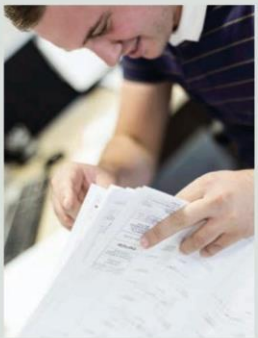
Supporting you every step of the way

We are always delighted to answer your questions and provide you with detailed specifications, design and pricing. If you have a complex project then we can develop products or design solutions to meet your specialist needs with our bespoke service.



Beautifully designed

All our contracts are drawn by skilled technicians, using AutoDesk Inventor, building accurate 3D models of the products, so all elements fit perfectly with each other and your building.



Continuous investment in automated manufacturing

Advanced technology is central to our Production facilities in Dorset. From automated engineering of component parts to high quality polyester powder painting for a durable and long lasting finish. We hate waste of all kinds and so continuously drive them out. Guaranteeing you the highest quality products, achieving your expectations and all delivered at the lowest possible cost.

Accurate installation, on time and budget

Our highly trained project managers will work with you to ensure our products are installed on time and to budget, even for the most challenging of projects.

The innovative assembly design of our Weather Louvres makes installation faster, helping to save vital time on site.

5%

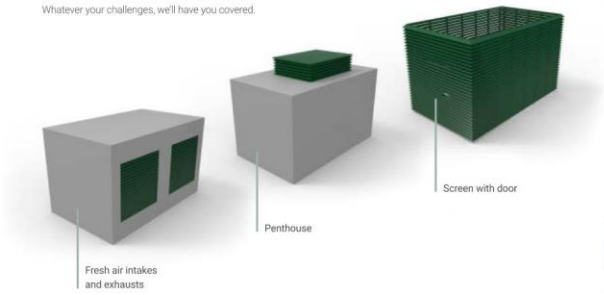
Material waste is down below 5% thanks to our unique software. All unused aluminium is recycled

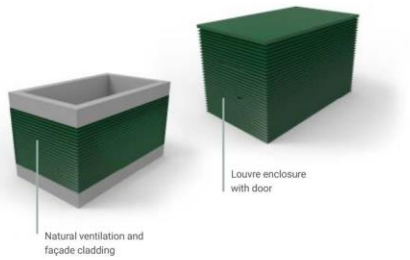
Weather Louvre applications

Our engineers will recommend the best solution for your project based on your specific application and requirements. Whether natural or mechanical ventilation is required, or if unsightly buildings or plant need 'hiding' from view.

The geographical location and height above sea level will also determine exposure to weather and wildlife which may require added protection.

Whatever your challenges, we'll have you covered.





With a robust aluminium profile this PLS 100 blade is commonly used for industrial purposes and large areas of louvre façade. It is expecially useful for plant screening, and when inverted this louvre provides screening of the plant when viewed from below.

Weather Louvre doors

Doors are available as both single and double leaf. There's an extensive range of furniture options to meet both your safety and security requirements. They are offered for active airflow or provided as dummy profiles with blanking.

Consider the weather

Louvre systems are designed to allow air to pass through the façade, either for inlet or outlet air ventilation requirements.

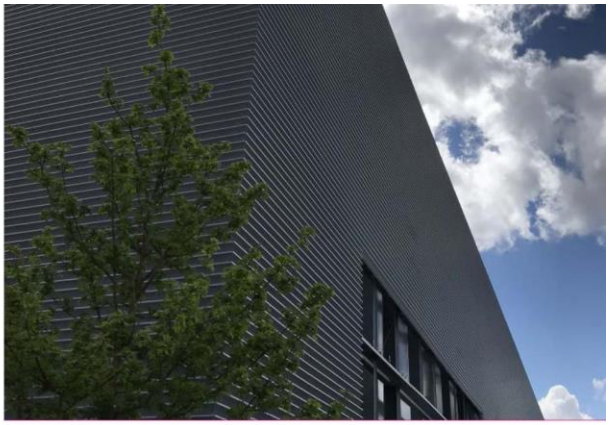
It is possible that under certain weather conditions, airborne rain will manage to pass through the louvre bank. The application of the louvre system and the prevailing circumstances will determine the severity of this issue. There are classifications in BS EN ISO 13030: 2001 to provide guidance for selecting the right louvre for your project in regards to the rain ingress. Panels of louvre are trialed on simulated rain test rigs, and are then classified in terms of their effectiveness at preventing rain from passing through the panel.

If it is highly important that rain is prevented from passing through the louvre system, a higher classification louvre should be selected, such as 'Class A'.

Penetration classes

Class	Effectiveness	Maximum allowed penetration of simulated rain l/h.m²
A	1 to 0.99	0.75
B	0.989 to 0.95	3.75
C	0.949 to 0.80	15.00
D	Below 0.8	Greater than 15.00

Source: BS EN ISO 13030: 2001



Penetration classes

The simulated wind and rain that the weather louvre is subjected to under the standard test is as follows:

- **Fan driven wind at a speed of 13 m/s (approximately 30mph)**
- **Water sprayed as rainfall at a rate of 75 l/h.**

The amount of water collected behind the louvre is compared to that of a similar test conducted with the louvre removed completely. The effectiveness is the proportion of water rejected by the louvre.

The louvre under test is 1m x 1m in size and provides useful comparative data between different design profiles. It does not necessarily replicate the most severe of weather conditions or qualify the need for appropriate water collection and drainage.

Resistence to air flow

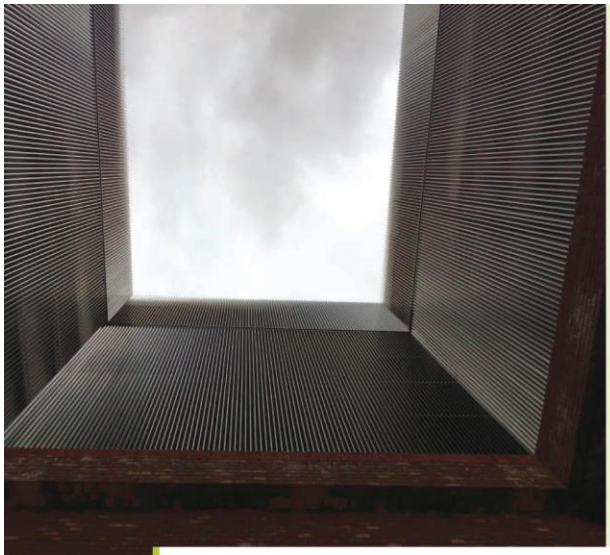
Entry or discharge loss coefficient classes

The coefficient of discharge (C_D) or entry (C_e) compares the performance of the louvre against an ideal louvre with minimal air resistance. It is expressed as a single class based on an average result of the tests measuring the pressure differential between the outside and inside of the louvre, giving the resistance to airflow. The air resistance is rated in classes, with '1' indicating the least resistance and '4' the most.

Entry or discharge loss coefficient C_D

Class	Entry or discharge loss coefficient C_D
1	0.4 to 1.0
2	0.3 to 0.399
3	0.2 to 0.299
4	0.199 and below

Source: BS EN ISO 13030: 2001



VertiBlade – created with designers and architects in mind

We were asked by an architect to help solve an issue with a new building on the Greenwich Peninsula in London. They calculated that the inherited steel work structure would not support the full weight of the brick work all the way to the top of the building and the architect's client wanted the sub-station transformers on the roof to be completely out of sight of the nearby school and residential properties.

This light-weight cladding system solved all the issues on-site

Following a couple of meetings with the architect, we came up with the idea of using the **VertiBlade** system so that the transformers would not be seen and without adding a heavy load to the supporting wall structure. In effect, adding a light-weight, visually attractive form of pervious cladding, when viewed from different angles at ground level.

VertiBlade

CASE STUDY

Greenwich Peninsula Sub-station

London

During the day, our **VertiBlade** provides a high definition profile, with crisp, clean lines and striking colour changes as the sunlight catches them. At night, this complete 3D screening to plant can turn into a light feature with an appropriate LED light system.

A detailed assessment was carried out by our acoustic experts

As the building was originally all brickwork there was no issue with noise breakout from the transformers. Acoustic experts at LCP, our sister company, carried out a detailed assessment of the plant to ensure that the noise levels at the school and residential properties were not going to be exceeded with the blade system proposed.

A meeting on-site with the local planners was arranged, where colour samples of the blades were handed over. The black ones, matching the colour of an adjacent building along with the results from the acoustic assessment, were subsequently approved in a new planning application.

A bespoke 3D corner section maintains the aesthetic appearance

Due to the way that the building had been designed, we developed a bespoke way of fixing the **VertiBlade** to the existing steel system that would align with the concrete stairwells at the end of the building. A special 3D section was also designed to create a crisp corner detail enhancing the aesthetic appearance of the system.

Because of the tight proximity of the site within its boundaries, it was crucial that the access equipment had the appropriate height and reach to deliver the installation contract.

VertiBlade

A very happy client

Our client said afterwards, "the high level cladding has now been completed and Caice has undertaken a fantastic job. The detailing is crisp and all of the lines are straight and clean. Installing the top section the opposite way around has added definition to the profile and when the light catches it the colour changes are striking. I am very happy with the finished product."

Weather Louvre options

1 How is the Weather Louvre system to be used

For plant screening our PLS100 provides the optimum solution and can be inverted should the viewing position be from below. For ventilation and rain defence our PLS 50 and PLS 50HP offer solutions to meet your needs.

2 Mullion and Purlin support

Selected to match the blade profile and structural requirements.

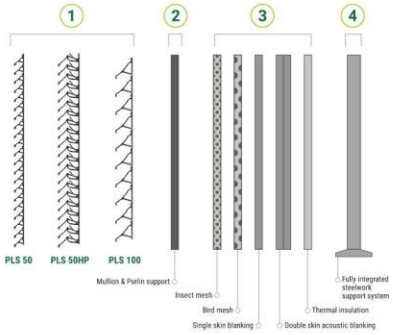
3 Optional panels fitted behind the Weather Louvres

These options will make your building work better and help to match your specific requirements.

- Bird mesh
- Insect mesh
- Thermal insulation
- Single skin blanking
- Double skin acoustic blanking

4 Fully integrated steelwork support system

We have developed a fully integrated steelwork support system to enable easy installation of our Weather Louvres for screening applications, enclosures or within large building apertures. Calculations can be provided to ensure structural and wind loading requirements are achieved.



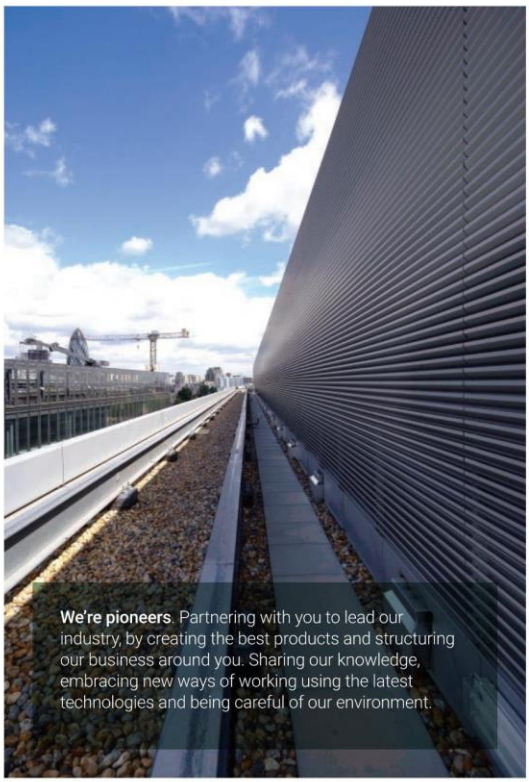
Weather Louvre blade profile view

Mullion options		
Mullion type	Blade/ Mullion	Mullions maximum unsupported height
M50	100mm	1,600mm
M55	105mm	2,000mm
M82	132mm	3,000mm

Mullion options		
Mullion type	Blade/ Mullion	Mullions maximum unsupported height
M50	160mm	1,600mm
M55	165mm	2,000mm
M82	192mm	3,000mm

Mullion options		
Mullion type	Blade/ Mullion	Mullions maximum unsupported height
M50	140mm	1,600mm
M55	145mm	2,000mm
M82	172mm	3,000mm

The overall depth of the louvre including the blade, mullion, purlin and supporting steelwork will be dependant on the on-site installed condition, taking into account factors such as wind loading and building structure.

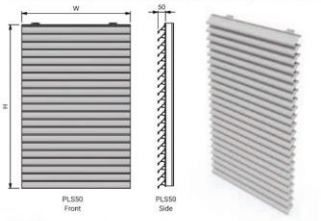


We're pioneers. Partnering with you to lead our industry, by creating the best products and structuring our business around you. Sharing our knowledge, embracing new ways of working using the latest technologies and being careful of our environment.

PLS 50 Weather Louvre Technical Data

caice

Weather Louvre, Standard 50mm Pitch Profile, 50mm Blade Depth



Typical weight with 50mm mullion at 1 metre centres – 16kg/m²

Generally louvres will be supplied in component parts for assembly on site. Joining brackets and fixings will be provided for assembly.

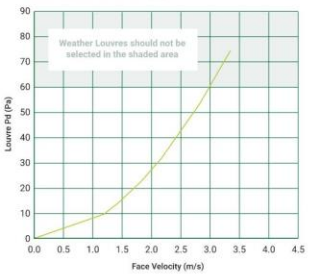
Installation services, support steelwork, flashings, fixings to the structure and mastic will not be provided unless stated.

Refer to the Weather Louvre Schedule and Product Code Definitions for the size and specification of each Weather Louvre.

A minimum of 10mm clearance should be allowed between the structure and the Weather Louvre sizes shown.

Performance

Resistance to Airflow (C_e)



Physical Free Area: 58%
Intake Coefficient C_e: 0.308
Intake Coefficient Class: 2

Rainwater Penetration Class		
Velocity	Effectiveness	Class
0.0	97.2%	B
0.5	95.9%	B
1.0	94.7%	C
1.5	90.9%	C
2.0	82.4%	C
2.5	64.2%	D

Material: Aluminium Extrusion

Finishes: Mill, Natural Anodised, Polyester Powder Paint to a range of RAL colours

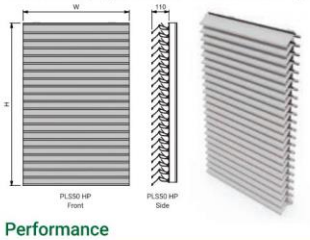
Insect/Bird Mesh: Provided as requested

Doors: Single and Double leaf with furniture to meet safety and security requirements.

If you require further technical data please contact Caice: 0118 918 6470 | enquiries@caice.co.uk | caice.co.uk

PLS 50HP Weather Louvre Technical Data

Weather Louvre, High Performance 50mm Pitch Profile, 110mm Blade Depth



Typical weight with 50mm mullion at 1 metre centres – 36kg/m²

Generally louvres will be supplied in component parts for assembly on site. Joining brackets and fixings will be provided for assembly.

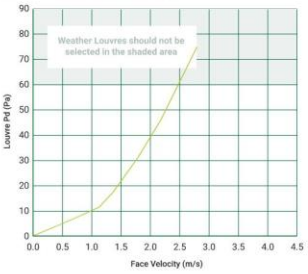
Installation services, support steelwork, flashings, fixings to the structure and mastic will not be provided unless stated.

Refer to the Weather Louvre Schedule and Product Code Definitions for the size and specification of each Weather Louvre.

A minimum of 10mm clearance should be allowed between the structure and the Weather Louvre sizes shown.

Performance

Resistance to Airflow (C_e)



Physical Free Area: 50%
Intake Coefficient C_e: 0.256
Intake Coefficient Class: 3

Rainwater Penetration Class		
Velocity	Effectiveness	Class
0.0	100%	A
0.5	100%	A
1.0	100%	A
1.5	100%	A
2.0	100%	A
2.5	99.4%	A

Material: Aluminium Extrusion

Finishes: Mill, Natural Anodised, Polyester Powder Paint to a range of RAL colours

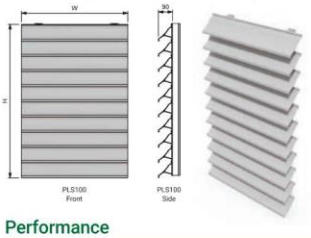
Insect/Bird Mesh: Provided as requested

Doors: Single and Double leaf with furniture to meet safety and security requirements.

If you require further technical data please contact Caice: 0118 918 6470 | enquiries@caice.co.uk | caice.co.uk

PLS 100 Weather Louvre Technical Data

Weather Louvre, Standard 100mm Pitch Profile, 90mm Blade Depth



Typical weight with 50mm mullion at 1 metre centres – 18kg/m²

Generally louvres will be supplied in component parts for assembly on site. Joining brackets and fixings will be provided for assembly.

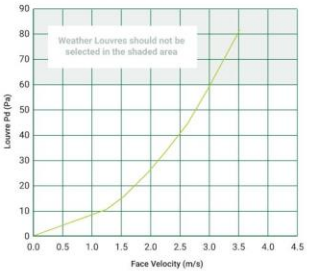
Installation services, support steelwork, flashings, fixings to the structure and mastic will not be provided unless stated.

Refer to the Weather Louvre Schedule and Product Code Definitions for the size and specification of each Weather Louvre.

A minimum of 10mm clearance should be allowed between the structure and the Weather Louvre sizes shown.

Performance

Resistance to Airflow (C_e)



Physical Free Area: 55%
Intake Coefficient C_e: 0.294
Intake Coefficient Class: 3

Rainwater Penetration Class		
Velocity	Effectiveness	Class
0.0	96.02%	B
0.5	93.5%	C
1.0	91.4%	C
1.5	85.5%	C
2.0	75.3%	D
2.5	56.6%	D

Material: Aluminium Extrusion

Finishes: Mill, Natural Anodised, Polyester Powder Paint to a range of RAL colours

Insect/Bird Mesh: Provided as requested

Doors: Single and Double leaf with furniture to meet safety and security requirements.

If you require further technical data please contact Caice: 0118 918 6470 | enquiries@caice.co.uk | caice.co.uk

Specifying the Weather Louvre system

Weather Louvre specification

We're here to help and can provide a detailed Weather Louvre specification for inclusion within the overall specification for your project. This is also available in a short form NBS Specification format if required.

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GOLD AWARD
Won at the prestigious
COMMAND WESSEX BEST AWARDS 2001

* Gold Award in the prestigious Command Wessex BEST Awards 2001, with a "World Class" benchmarked score against thousands of other similar businesses throughout the UK and Europe.

Weather Louvre Door furniture

Hardware and Furniture

Standard Door Hardware and Furniture on Weather Louvre Doors Produced by Caice

Component Name	Image	Specification
Pivot Hinge		• Stainless steel • Custom milled manufacture
Lock Cylinder		• Euro Cylinder and Turn • Satin Chrome • MP10 restricted 10 pin cylinders • Secured by Design • Manufactured to BS EN BS EN 1303 Grade 6 • Key to differ (KTD), Keyed Alike (KA) and Under Master Key (UMA) options available
Door Handle		• Grade 304 stainless steel satin finish with solid investment cast stainless steel components throughout • 128.5mm lever length with a 66mm projection • Suitable for internal and external use • BS EN 1906 : 2010 Grade 3 • BS EN 1670 : 2007 Grade 5
Escutcheon		• Grade 304 stainless steel satin finish rose • 50mm diameter x 8mm screw on rose design • BS EN 1906 : 2010 Grade 3 • BS EN 1670 : 2007 Grade 5
Sashlock		• Euro Profile Sashlock – 65mm Case, 44mm Backset radius

Weather Louvre Door furniture

Hardware and Furniture

Component Name	Image	Specification
Gas Strut		• Piston Gas Strut • 200mm stroke • 50N force
Shoot Bolt		• Spring Loaded shoot bolt • 220 mm bolt length. 12mm diameter • Mild steel Galvanised finish
Push Pad		• Emergency Hardware • Silver painted Finish
Exterior Handle		• Emergency Hardware • Silver painted Finish • BS8300

The information is based directly on manufacturers and agent's details and although correct at the time of writing will be subject to change.

Non-standard door furniture is available, charged at an additional rate. Caice can, upon request, issue additional optional standard furniture from or pre-approved range at an additional rate.

Composite Acoustic Panel

Data Sheet

Specification:

60, 80 and 100mm thick panels. Solid outer skin and perforated inner skin. Controlled density resin bonded mineral wool infill.

Finish options:

Externally polyester powder painted to a standard stock colour.

(Colour options available on request).

General:

Mineral wool non-combustible Class A1.

Water permeability (EN 14509) Class A (1200 PA)

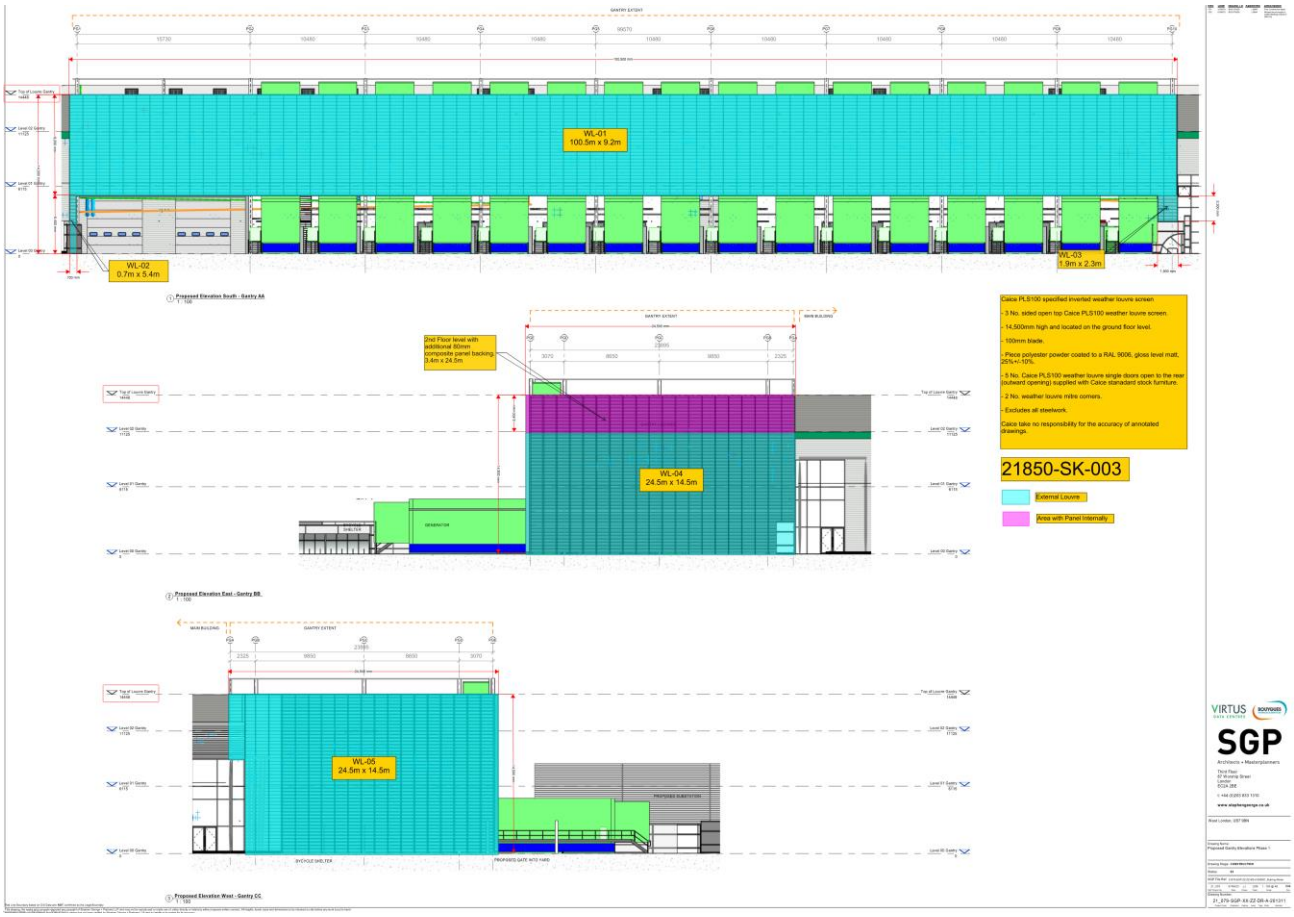
Weight kg per m²; 60mm = 14.4 kg, 80mm = 16.2 kg, 100mm = 18 kg

Table 1 coefficient of absorption at octave band centre frequencies:						
Panel	125	250	500	1k	2kHz	4kHz
60mm	0.31	0.63	0.86	0.91	0.89	0.88

Table 2 sound transmission at octave band centre frequencies:						
Panel	125	250	500	1k	2kHz	4kHz
60mm (dB)	19	23	31	32	26	42

*Reference data for 60mm panel only.

Revision 1.0 last updated on 08/03/2023
Caice ID CAICE-TEC-0004 / CAICE-256449820-714


WL-01
100.5m x 9.2m
WL-02
0.7m x 5.4m
WL-03
1.9m x 2.3m
2nd Floor level with additional 80mm composite panel backing 3.4m x 24.5m
WL-04
24.5m x 14.5m
WL-05
24.5m x 14.5m
Casoc PLS100 specified inverted weather louvre screen
- 3 No. sided open top Casoc PLS100 weather louvre screen
- 14,500mm high and located on the ground floor level.
- 100mm blade.
- Pleca polyester powder coated to a RAL 9006, gloss level matt, 25%+/-10%.
- 5 No. Casoc PLS100 weather louvre single doors open to the rear (outward opening) supplied with Casoc standard stock furniture.
- 2 No. weather louvre mitre corners.
- Excludes all steelwork.
Casoc take no responsibility for the accuracy of annotated drawings.
21850-SK-003
External Louvre
Area with Panel Internally
SGP