



**BRUAG**  
Innovation for Architecture

# Perforated Facades

CELLON<sup>®</sup> design

Technical data sheet for planning,  
construction and execution

A.2

Version 3.0

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# General Information

01.

## Material

Our **CELLON®** panel is a high-pressure laminate panel (HPL Compact or solid core panel) consisting of 70% cellulose webs and 30% phenolic resin. The extremely weather and frost-resistant material is ideal for outdoor applications.

**Application area:** mounted vertically in outdoor areas (e.g. facades, balcony railings)  
**Panel thickness (weight):** 8mm (approx. 12kg/m<sup>2</sup>), 10mm (approx. 15kg/m<sup>2</sup>)  
**Reaction to fire class:** RF2, B1 (DIN 4102-1), B-s1-d0 (EN 13501-1)

The raw panels are project-specifically cut to the desired dimensions using laser technology (including drill holes). You choose the **width (x)** and the **length (y)** of the panels individually. Do you want round cuts or additional cut-outs? Simply draw them in your DXF plan and they will be **manufactured to size**.

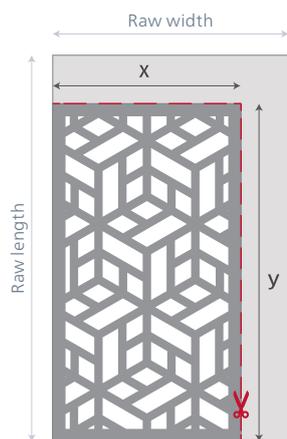
## Panel Formats

Please consider the following raw panel formats for waste optimisation:

perforated panels

### CELLON® design

Raw width	Raw length
1200 mm	2400 mm
1280 mm	3000 mm *
1500 mm	3600 mm
1800 mm	3600 mm



### Note

Whenever possible, the raw material sizes should be considered when planning the panel layout so that panel waste can be minimised. We support you with this.

\*Only this format is also available with a decor surface in stone or wood look.

# General Information

01.

## Data Transmission for Orders

Please note the following when placing an order:

### Data Format

- DWG / DXF Data
- Cadwork 2D or 3D Data
- Parts lists in Excel (if only as Excel without CAD file is sent, it might result in additional work in our work preparation)

### Data Content and Structure

- Panels are drawn on a separate layer
- Drawing in 1:1 ratio
- Measurement of at least one long and short side to be able to verify the scale
- Boreholes (drawn as a closed circle), cut-outs, etc. are marked accordingly
- Special requests for grouping and/or palletisation must be explicitly specified. Normally there is room on one pallet for 120 square metres of panels. Within the pallet there is no sorting by panel numbers etc.

### Own Design (the following specifications must be observed for own designs)

- Design must be created as CAD drawing (DWG or DXF file)
- Contours must be neatly closed and drawn as a line (not several lines on top of each other)
- Size ratio must be clearly visible

In the event of post-processing by Bruag Design Factory AG, the resulting additional work will be invoiced.

## Storage and Cleaning Instructions

CELLON® panels must never be stored unprotected horizontally outdoors. If water remains on the horizontally lying panels, damage to the paint may occur! Please always place the dry PU foam foils supplied as a separating layer between the individual boards.

The boards can be cleaned with water and a cloth or magic sponge. Careful use of a high-pressure cleaner is also possible with sufficient distance and little pressure. Do not use any chemical cleaning agents.

## Cutting and Drilling Guidelines

Basically, cutting to size on site should be avoided and the panels should already be ordered to the project-specific size whenever possible. However, in exceptional cases it is possible to process the panels on site, with the note that the panels are coated and the cut edge will therefore not have the same colour after cutting as the surface. Tools with carbide cutting edges or diamond cutting edges are advantageous as cutting items. The visible side should be at the top when cutting and, if possible, a guide rail should be used.

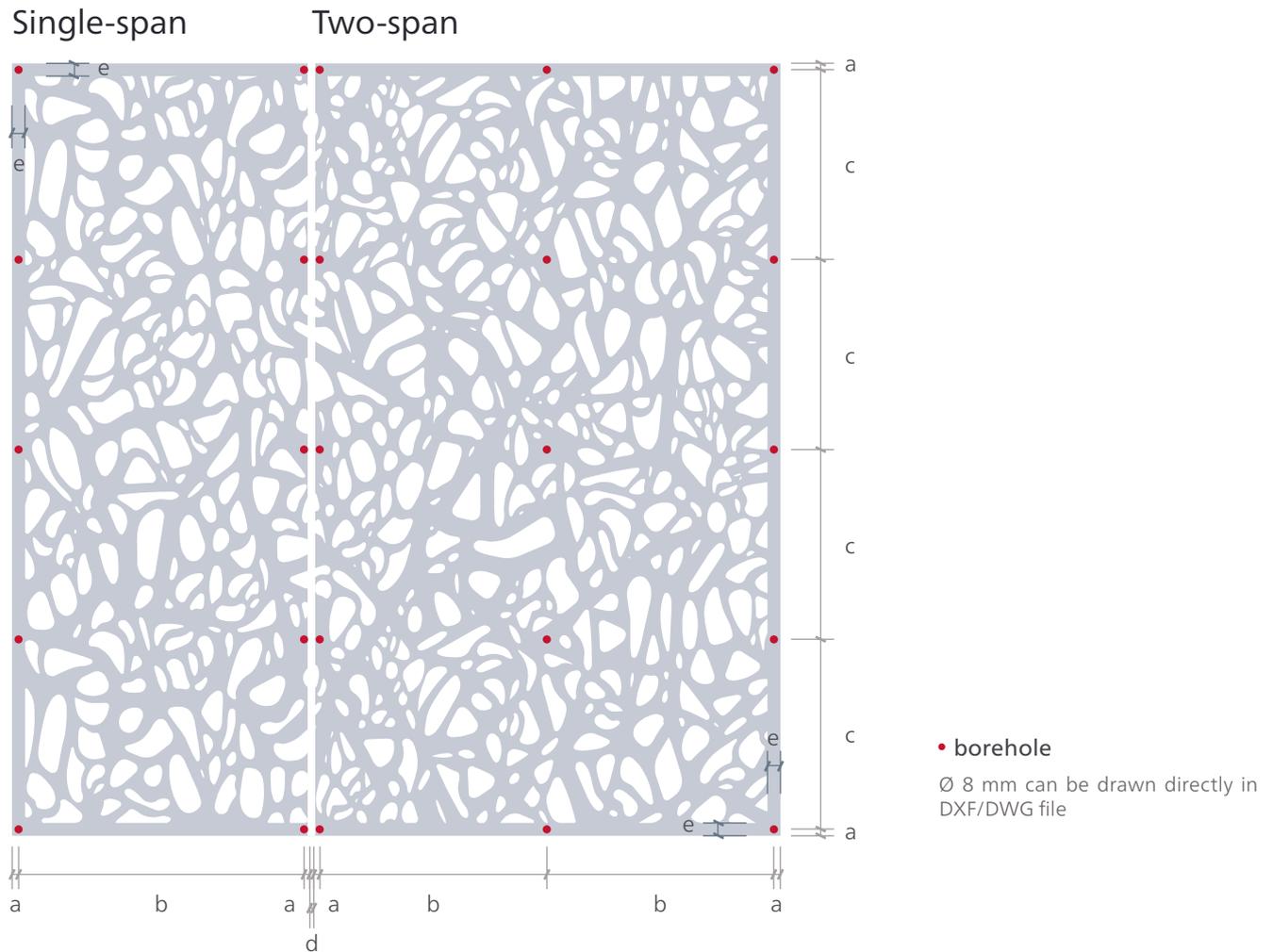
Spiral or dowel drills made of solid carbide are ideally used for drilling.

The material does not require post-treatment from the point of view of weather protection. However, if necessary, the edge can be coated with the supplied reserve paint.

# Fastenings

02.

## Fastening Distances



Maximum distance according to wind load  $q_{ek}$  (wind pressure or suction)

Position in mm	Description	CELLON® 8mm				CELLON® 10mm			
		0.5 kN/m <sup>2</sup>	1.0 kN/m <sup>2</sup>	1.5 kN/m <sup>2</sup>	2.0 kN/m <sup>2</sup>	0.5 kN/m <sup>2</sup>	1.0 kN/m <sup>2</sup>	1.5 kN/m <sup>2</sup>	2.0 kN/m <sup>2</sup>
a	Distance borehole to edge	20				20			
b	Horizontal borehole distance	970	815	735	685	1300	1200	1030	890
c	Vertical borehole distance	645	465	350	235	290	170	130	115
d	Joint	6				6			
e	Frame without perforation	50				50			

**Reciprocal conversion:**

$$c \text{ (adjusted)} = b \text{ (max)} / b \text{ (effectiv)} \times c \text{ (max)}$$

$$b \text{ (adjusted)} = c \text{ (max)} / c \text{ (effectiv)} \times b \text{ (max)}$$

The values given are guidelines and do not release you from having an object-related inspection carried out by a qualified engineer. Test results for the tests according to EN 789, EN1048, EN 14358, EN 383, EN 1383, EN 310 and EN 13879 can be found in a separate test report.

# Fastenings

02.

## Fasteners

### Metal Substructure

#### Hexagon-head screw (self-drilling with sealing washer)

Material:	Stainless steel A2 (with drill point and shaped thread made of hardened steel)
Length:	32 mm
Nominal diameter:	5.5 mm
Head diameter:	16 mm
Drives:	SW8, hexagon head
Borehole diameter:	8 mm



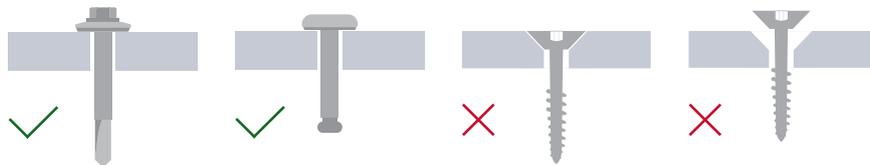
#### Blind Rivet

Material:	Aluminium/Stainless steel A2
Length:	8-13 mm
Nominal diameter:	5.0 mm
Head diameter:	14 mm
Drives:	Blind rivet tool
Borehole diameter:	8 mm



### Note

Screws and rivets are to be placed concentrically in the drilled holes.  
**NO COUNTERSUNK SCREWS MUST BE USED!**



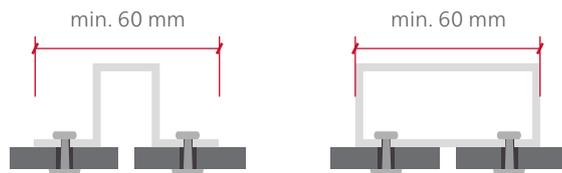
# Substructure

03.

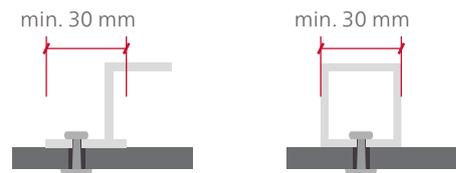
## Visible Substructure

### Profile Width

in Joint Area

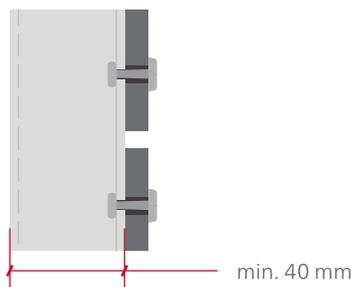


at Intermediate Profile



### Profile Depth

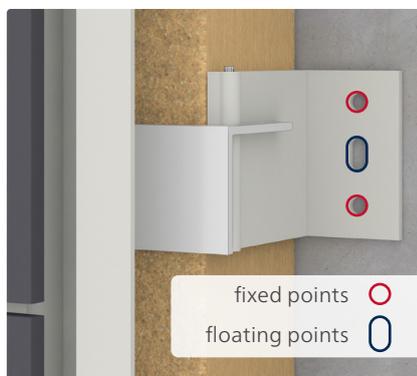
with Open Horizontal Joints



Horizontal joints can be left open. In this case, the ventilation space must be at least 40 mm. (cf. chapter 1.16.1 Technifo 4 of the SFHF).

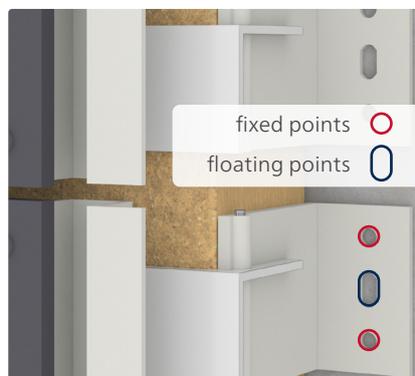
## Construction Specifications

In order to cope with the greater linear expansion of a metal substructure, the following design measures must be observed:



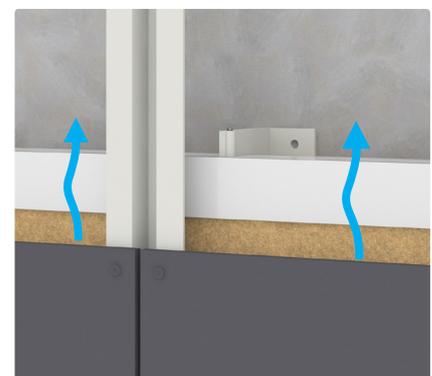
### Protection against deformation

For vertical and horizontal profile connections, fixed and sliding points must be implemented according to the manufacturer's instructions.



### Protection against tension

Long profiles (>3000 mm) are to be separated by dilatation joints. Profile joints are to be formed in the panel joints.



### Protection against condensate

The ventilation space must have a permanent vertical flow. In the case of open joints, a ventilation space of at least 40 mm depth is required.

# Substructure

03.

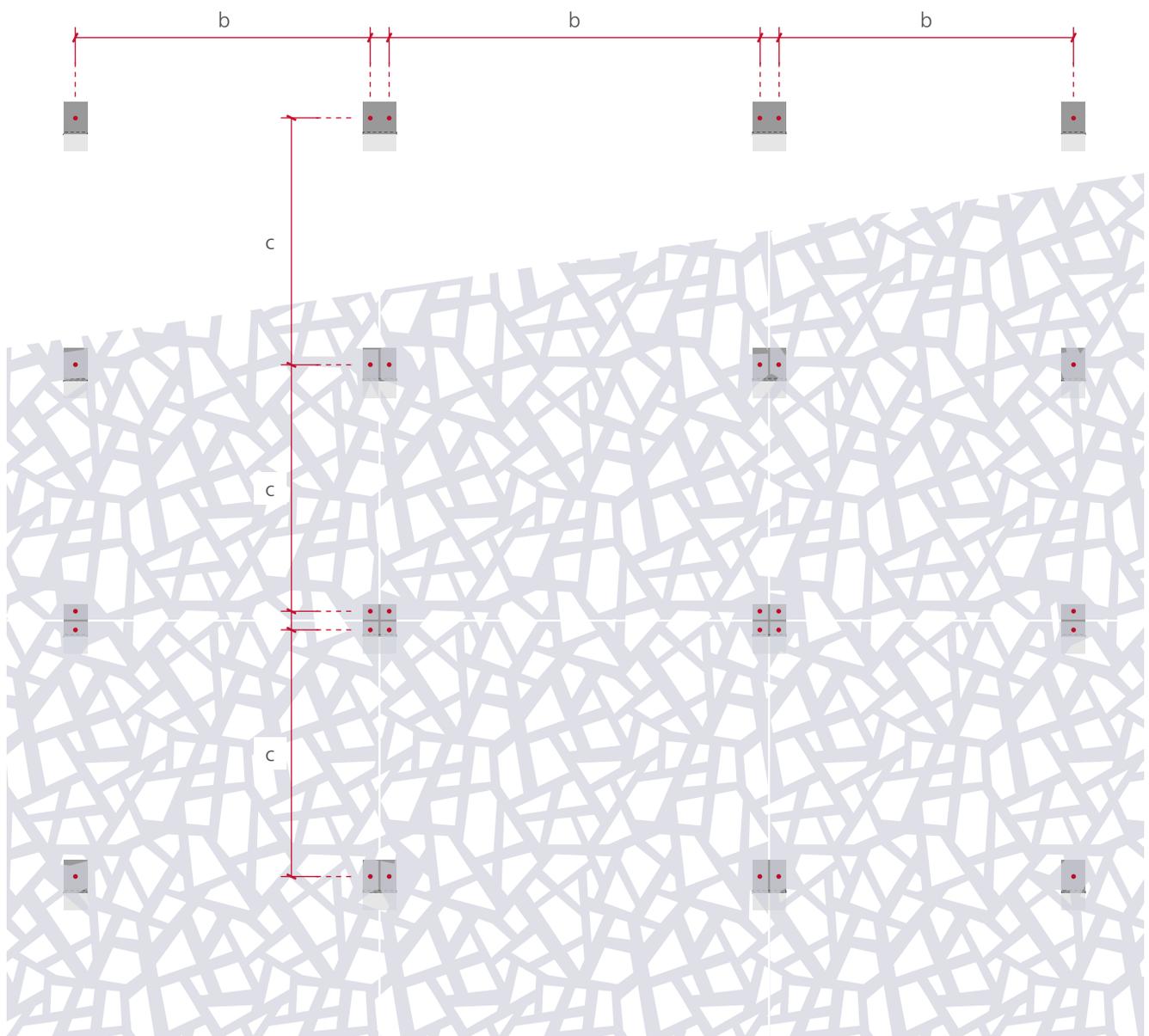
## Invisible Substructure

### Z-profile

#### Floor Plan



#### Elevation Plan



# Substructure

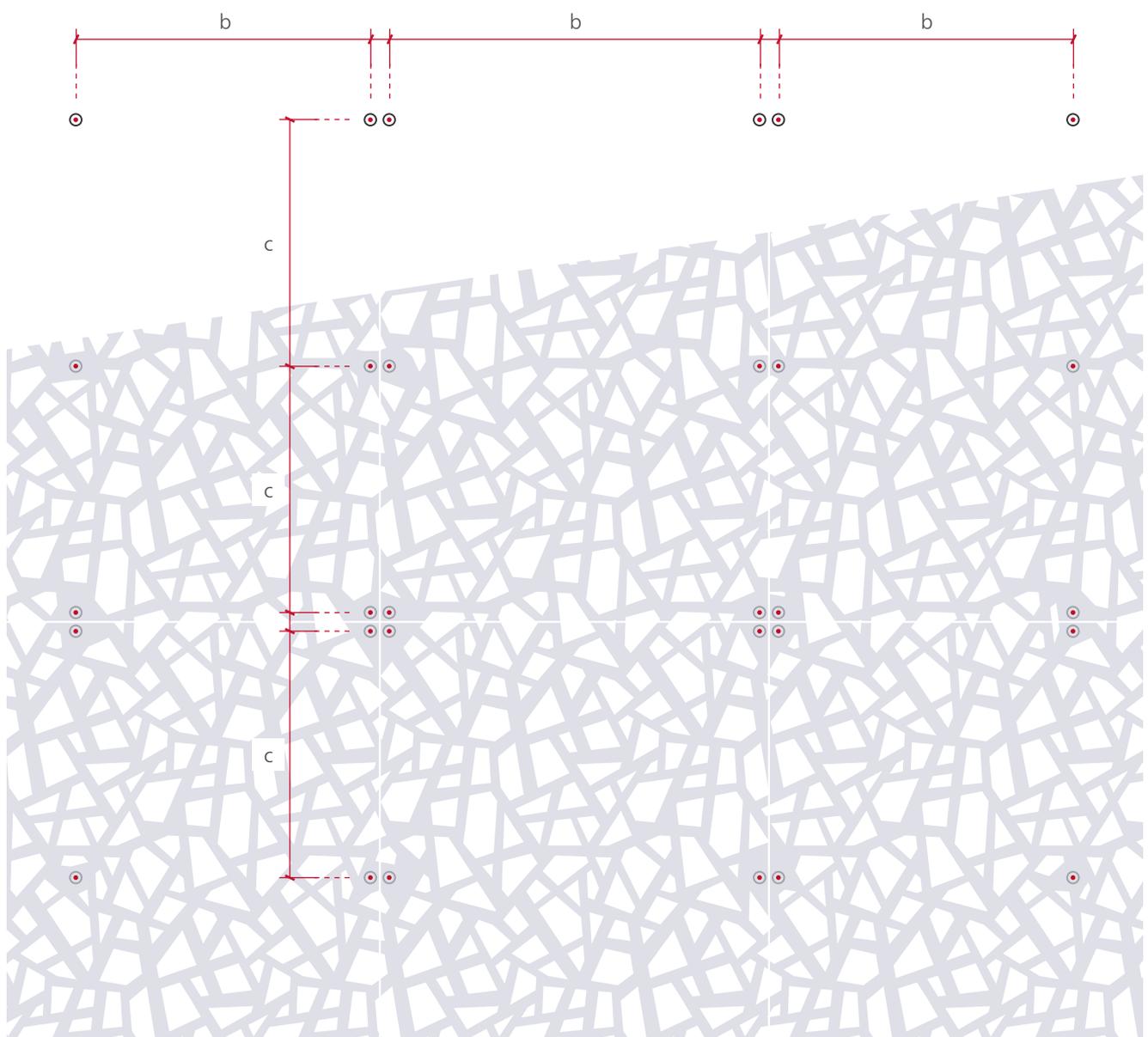
03.

## Spacer Sleeve

### Floor Plan



### Elevation Plan

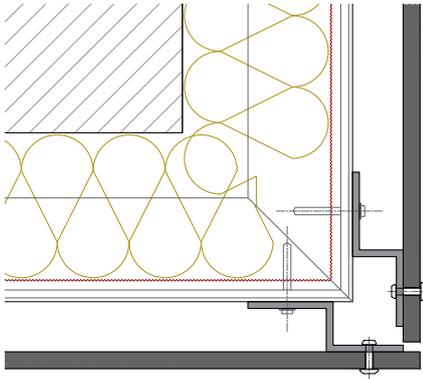


# Corner & Transition Profiles

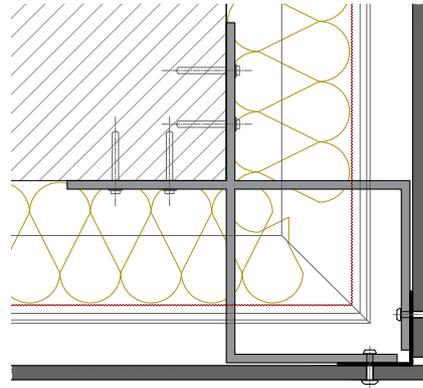
04.

## Corner Constructions

with Z-profile



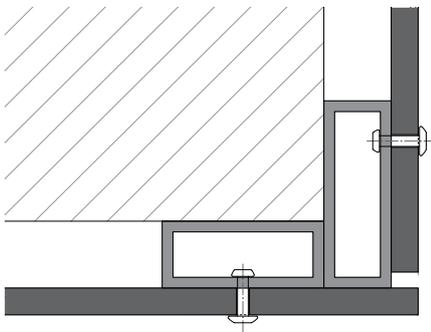
with facade corner angle



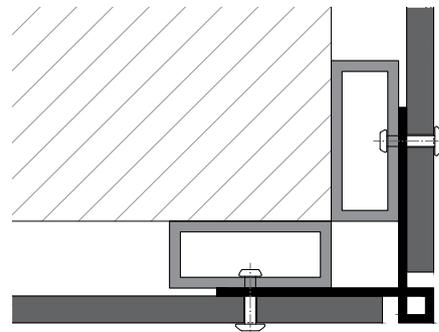
Corners can be formed butt-jointed or with standard corner profiles. The joint is to be planned with approx. 6 - 8 mm.

## Corner Profiles

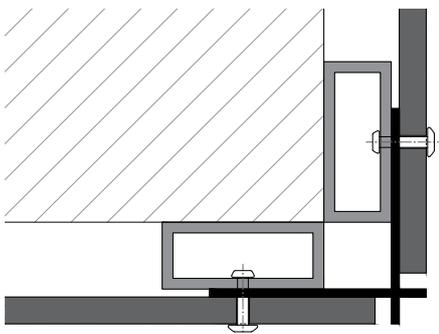
Butt-jointed



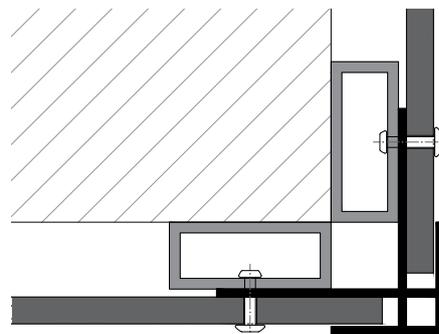
Cube Corner Profile



Cross Corner Profile



Cut Edge Cover Profile



# Construction Solutions

# 05.

Substructures for perforated facades are usually made of metal. In addition to conventional square tubes, angles or omega profiles are also suitable. If no substructure should be visible it is also possible to use punctual fixings in the form of Z-profiles. The substructure must be fixed to the wall according to the technical specifications and adapted to the load of CELLON® design panels.

With metal substructures, the panels are fixed directly to the substructure.

Due to the open areas of a perforated facade, the layer behind may must meet higher requirements such as wind and weather protection. We refer herewith to TECINFO 4 of the SFHF and its measures for facades with open areas. A ventilation space of 40mm width is recommended. If higher requirements must be met, the following common facade construction systems are suitable:

- Ventilated facade system with **UV-resistant facade membranes**
- Timber building with **FORMBOARD TOP PINE®**
- Complement/refurbishment of **other facade constructions** (e.g. concrete, glass or external wall insulation)



Visible substructure



Invisible Substructure

## UV-resistant facade membranes

Continuous metal profiles

Punctual metal profiles / sleeves

A. with aluminum bracket	A.1	A.2
B. with spacer screws	B.1	B.2
C. with wooden cross battens	C.1	C.2

## FORMBOARD TOP PINE®

D. as timber construction	D.1	D.2
E. as a double ventilated facade	E.1	E.2

## Complement/refurbishment

F. masonry and visible concrete	F.1	F.2
G. plastered external wall insulation	G.1	G.2
H. plastered external wall insulation with additional insulation	H.1	H.2

The detailed constructions listed below are illustrative and must be checked individually for each building project by the architect, planner and engineer. The execution is the responsibility of the installation company. Bruag gives no warranty and has no responsibility for the entire construction system, beyond the general conditions of the contract.

# Construction Solutions

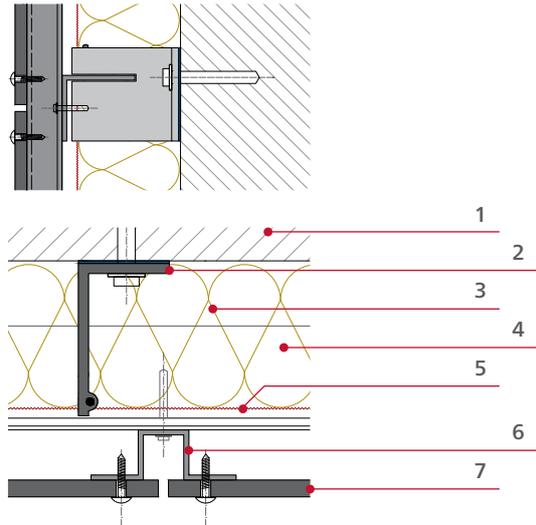
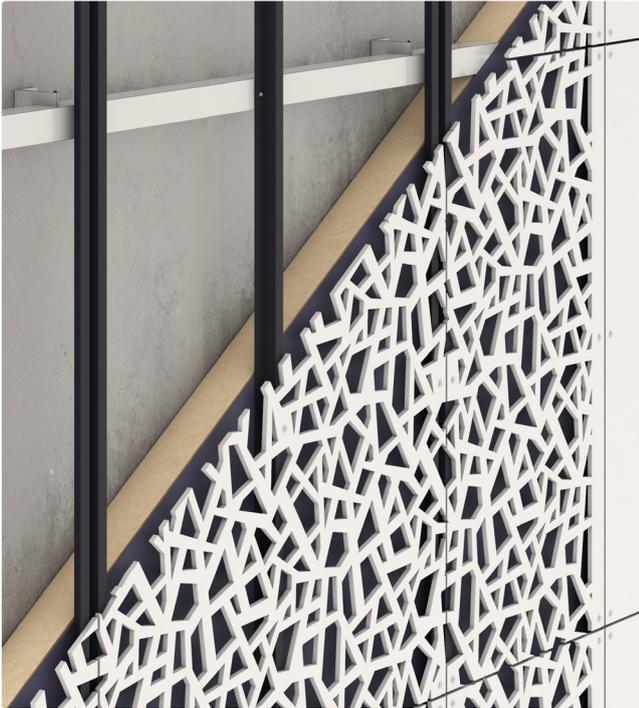
05.

## UV-resistant facade membranes

### A. Aluminum Bracket

#### A.1 Continuous Metal Profiles

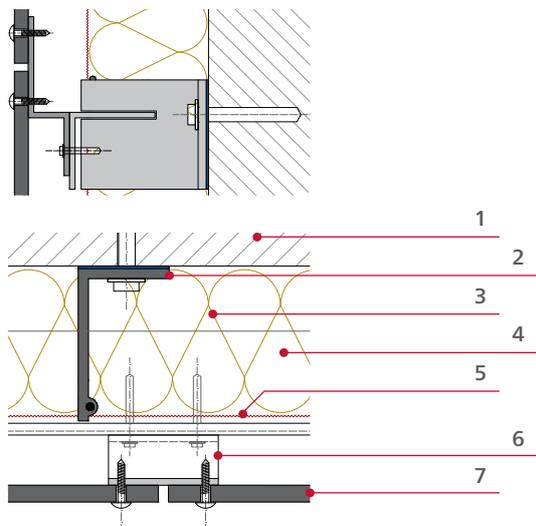
Visible substructure



- 1 Wall
- 2 Aluminum bracket (without thermal bridges)
- 3 Insulation
- 4 Aluminium angle
- 5 UV-resistant facade membranes
- 6 Metal profile (e.g. Omega-, Z-, square profile)
- 7 CELLON® panel

#### A.2 Punctual Metal Profiles

Invisible substructure



- 1 Wall
- 2 Aluminum bracket (without thermal bridges)
- 3 Insulation
- 4 Aluminium angle
- 5 UV-resistant facade membranes
- 6 Punctual metal profile (e.g. Z-, U-profile)
- 7 CELLON® panel

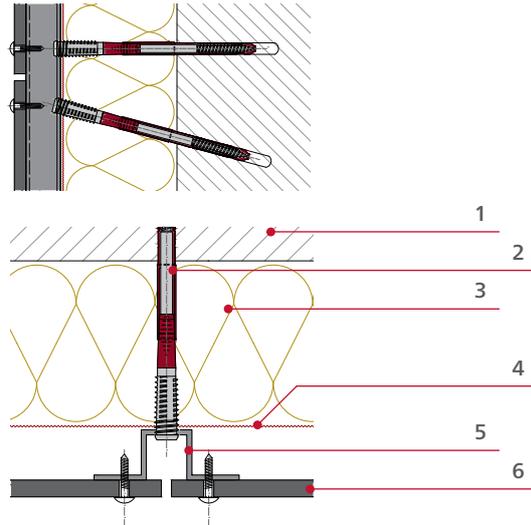
# Construction Solutions

# 05.

## B. Spacer Screw

### B.1 Continuous Metal Profiles

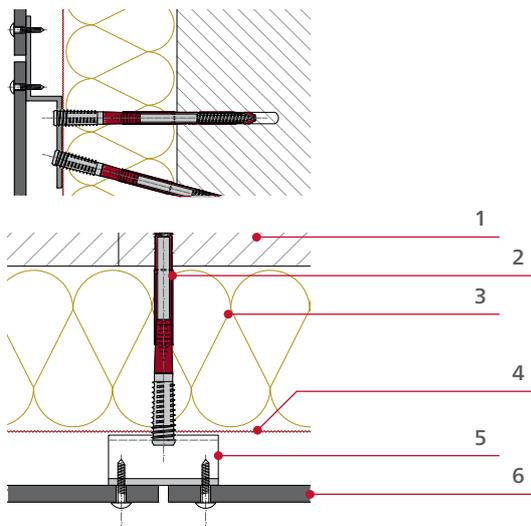
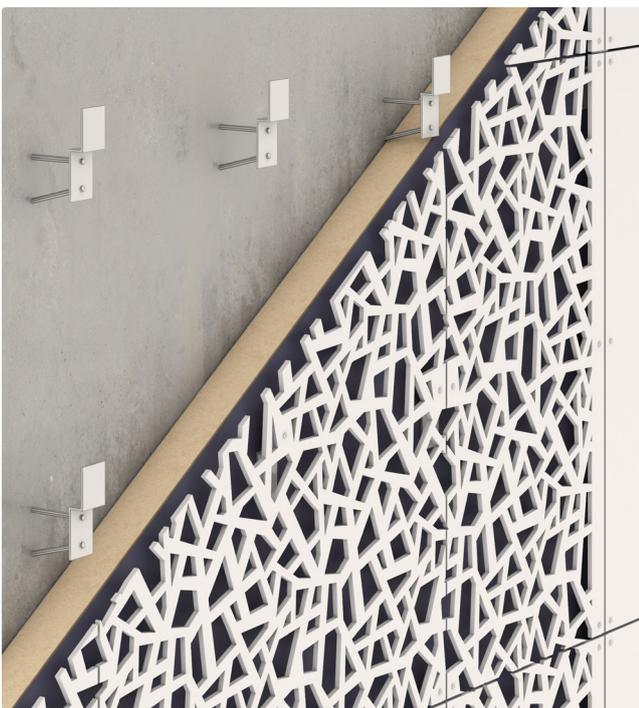
Visible substructure



- 1 Wall
- 2 Spacer Screw
- 3 Insulation
- 4 UV-resistant facade membranes
- 5 Metal profile (e.g. Omega-, Z-, square profile)
- 6 CELLON® panel

### B.2 Punctual Metal Profiles

Invisible substructure



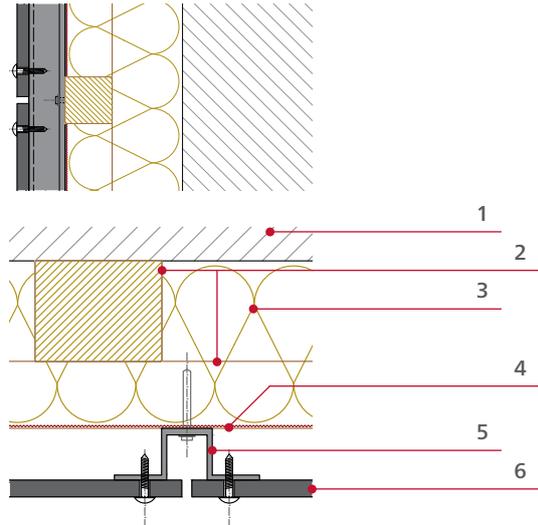
- 1 Wall
- 2 Spacer Screw
- 3 Insulation
- 4 UV-resistant facade membranes
- 5 Punctual metal profile (e.g. Z-, U-profile)
- 6 CELLON® panel

# Construction Solutions

# 05.

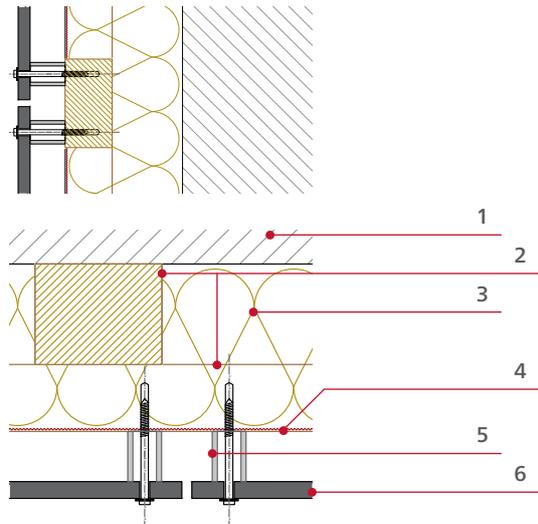
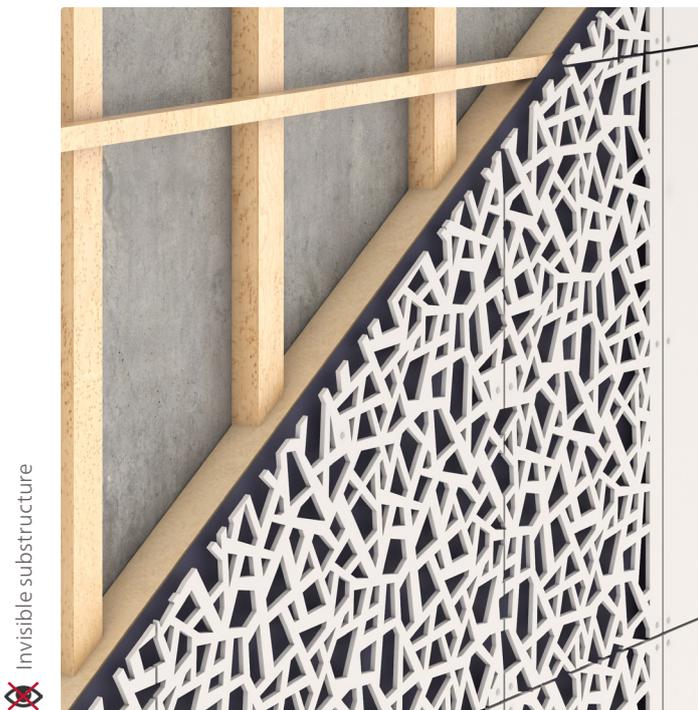
## C. Wooden Cross Battens

### C.1 Continuous Metal Profiles



- 1 Wall
- 2 Wooden Cross Battens
- 3 Insulation
- 4 UV-resistant facade membranes
- 5 Metal profile (e.g. Omega-, Z-, square profile)
- 6 CELLON® panel

### C.2 Punctual Spacer Sleeves



- 1 Wall
- 2 Wooden Cross Battens
- 3 Insulation
- 4 UV-resistant facade membranes
- 5 Distance screw with sleeve
- 6 CELLON® panel

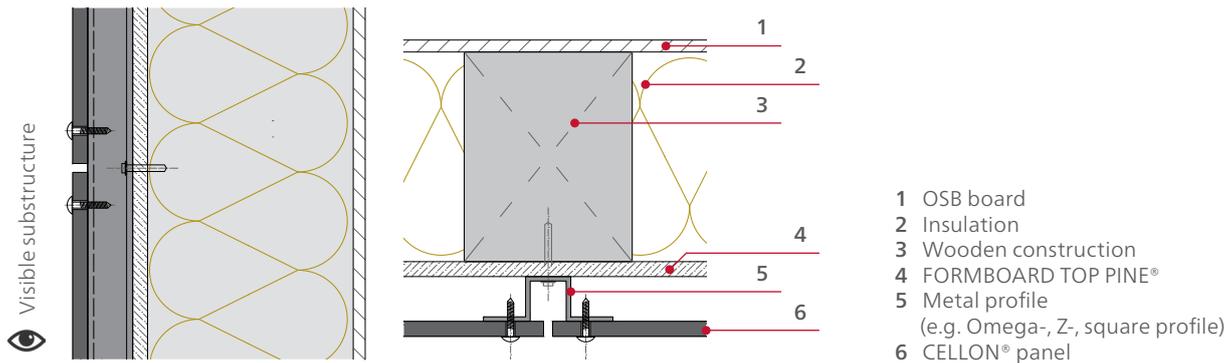
# Construction Solutions

05.

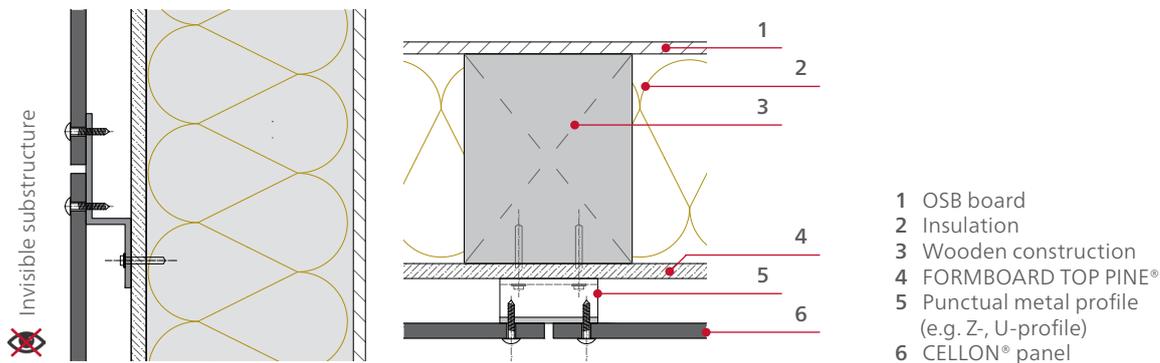
## FORMBOARD TOP PINE®

### D. Timber Construction

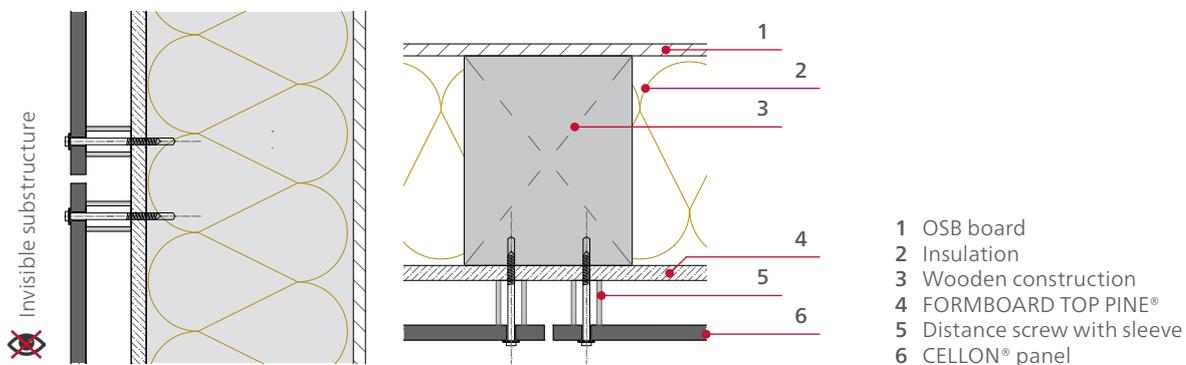
#### D.1 Continuous Metal Profiles



#### D.2a Punctual Metal Profiles



#### D.2b Punctual Spacer Sleeves



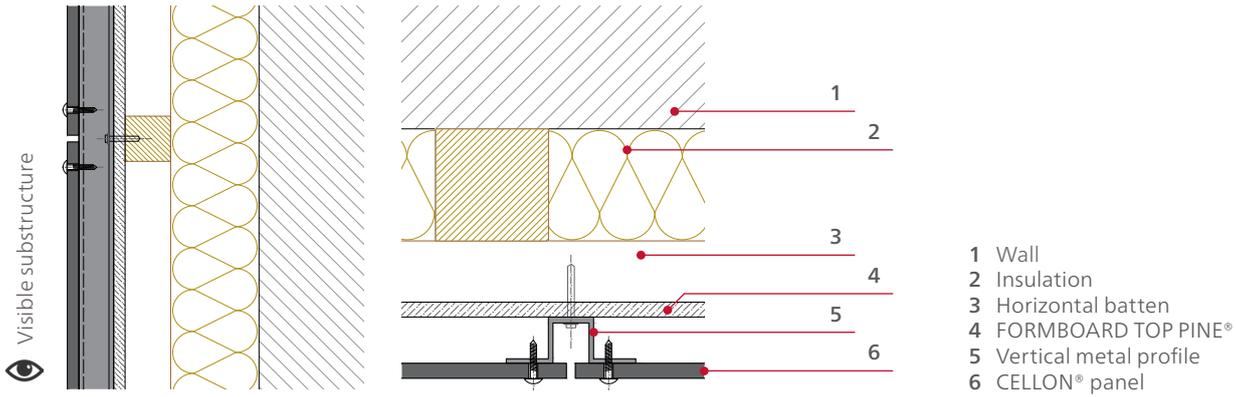
When using the FORMBOARD TOP PINE® in a wooden construction system without additional back ventilation, the vapour diffusion between the layers and the sealing of the butt joints must be taken into consideration. Condensation inside the insulation or water infiltration through the joints should be absolutely avoided. Please contact an engineering office for exact calculations. The distance between the fixing points on wooden construction must not exceed the maximum fixing distances according to page 3.

# Construction Solutions

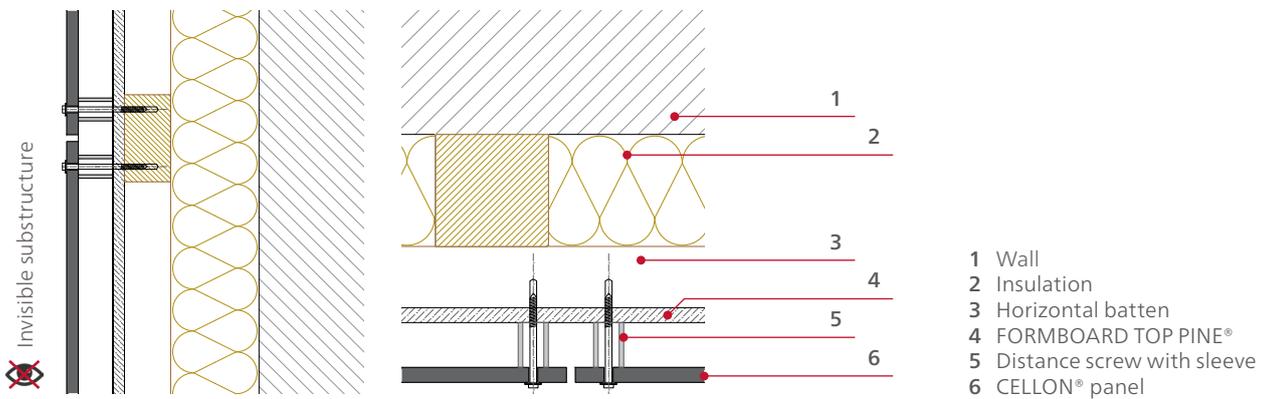
05.

## E. Double Ventilated Facade

### E.1 Continuous Metal Profiles



### E.2 Punctual Spacer Sleeves



Instead of the FORMBOARD TOP PINE®, CELLON® can also be used for the rear facade layer in the case of a ventilated double skin facade construction system.

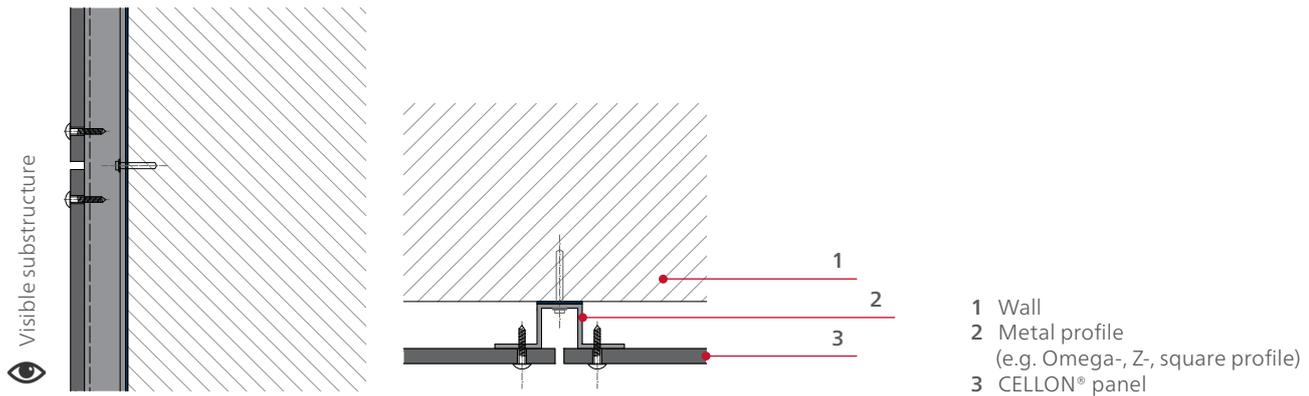
# Construction Solutions

05.

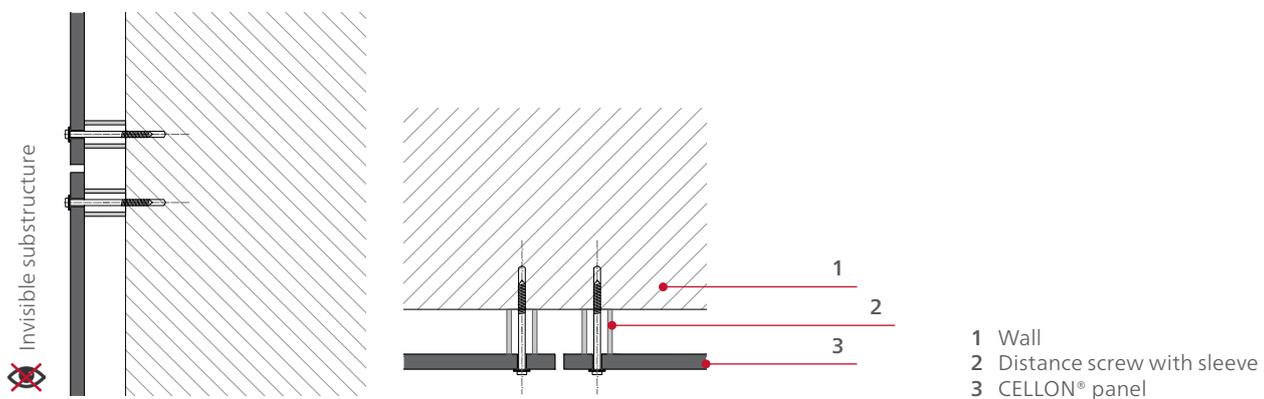
## Complement/refurbishment of other facade constructions

### F. Masonry and Visible Concrete

#### F.1 Continuous Metal Profiles



#### F.2 Punctual Spacer Sleeves

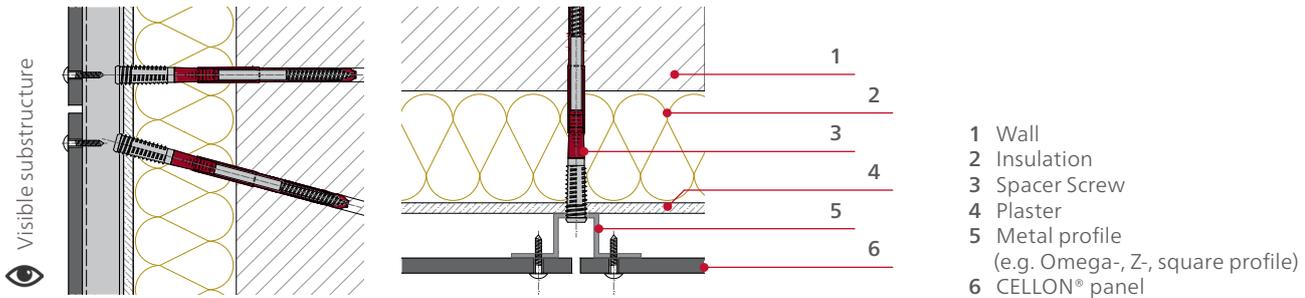


# Construction Solutions

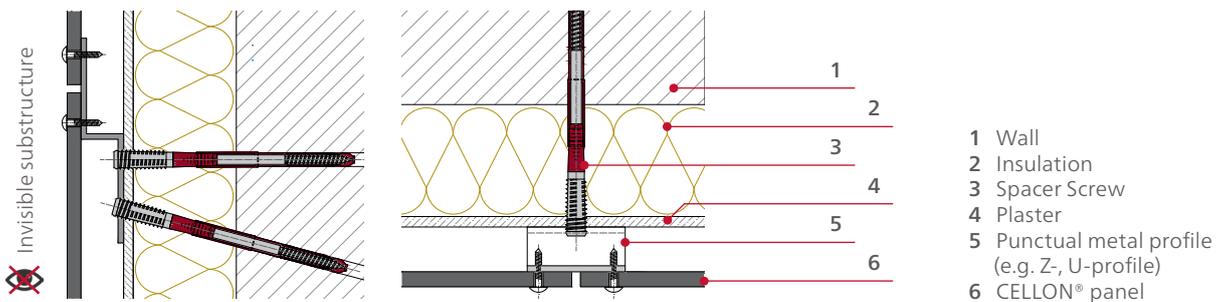
05.

## G. Plastered External Wall Insulation

### G.1 Continuous Metal Profiles

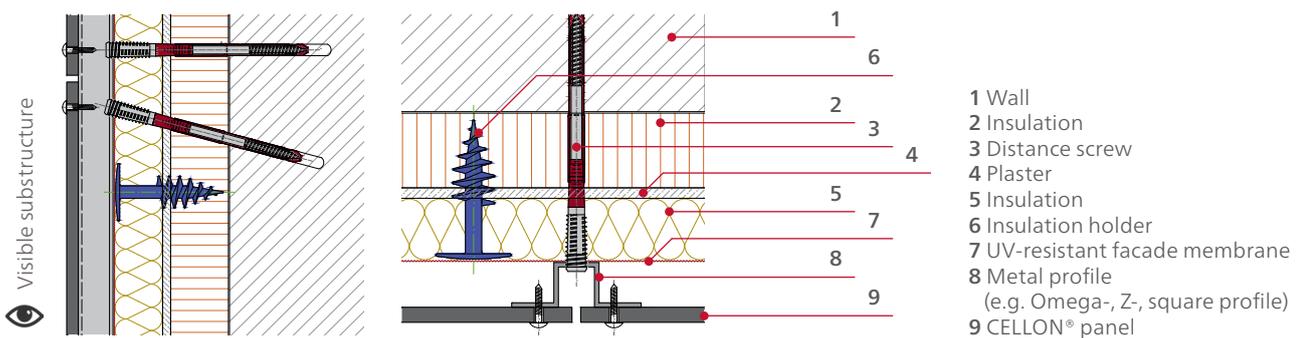


### G.2 Punctual Metal Profiles

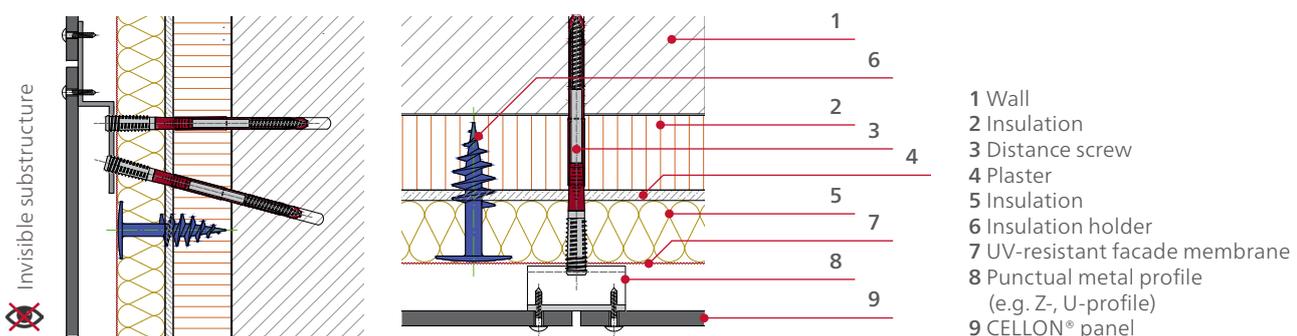


## H. Plastered External Wall Insulation with Additional Insulation

### H.1 Continuous Metal Profiles



### H.2 Punctual Metal Profiles



# Design

06.

You can find the entire perforation collection in our catalogue.





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