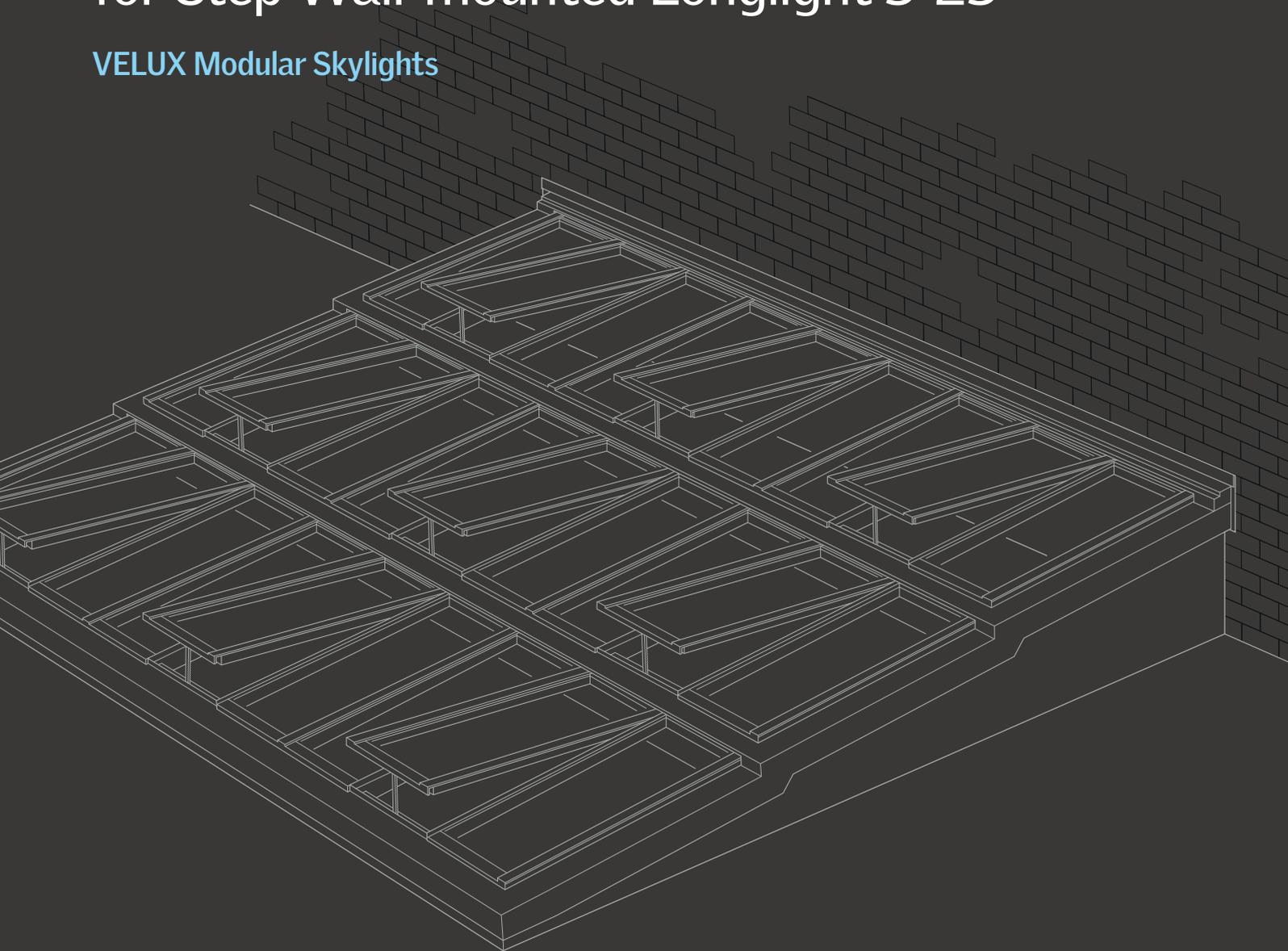


**VELUX®**

Commercial

# Sub-construction for Step Wall-mounted Longlight 5-25°

VELUX Modular Skylights



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## Before you start

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Before you can build a durable and secure sub-construction to provide the supporting base of the VELUX modular skylights, you will need to have the following three specification documents at hand and follow them closely:



Sub-construction quality assurance (QA) document and specification document. These two documents must be obtained through your local VELUX Commercial sales office.



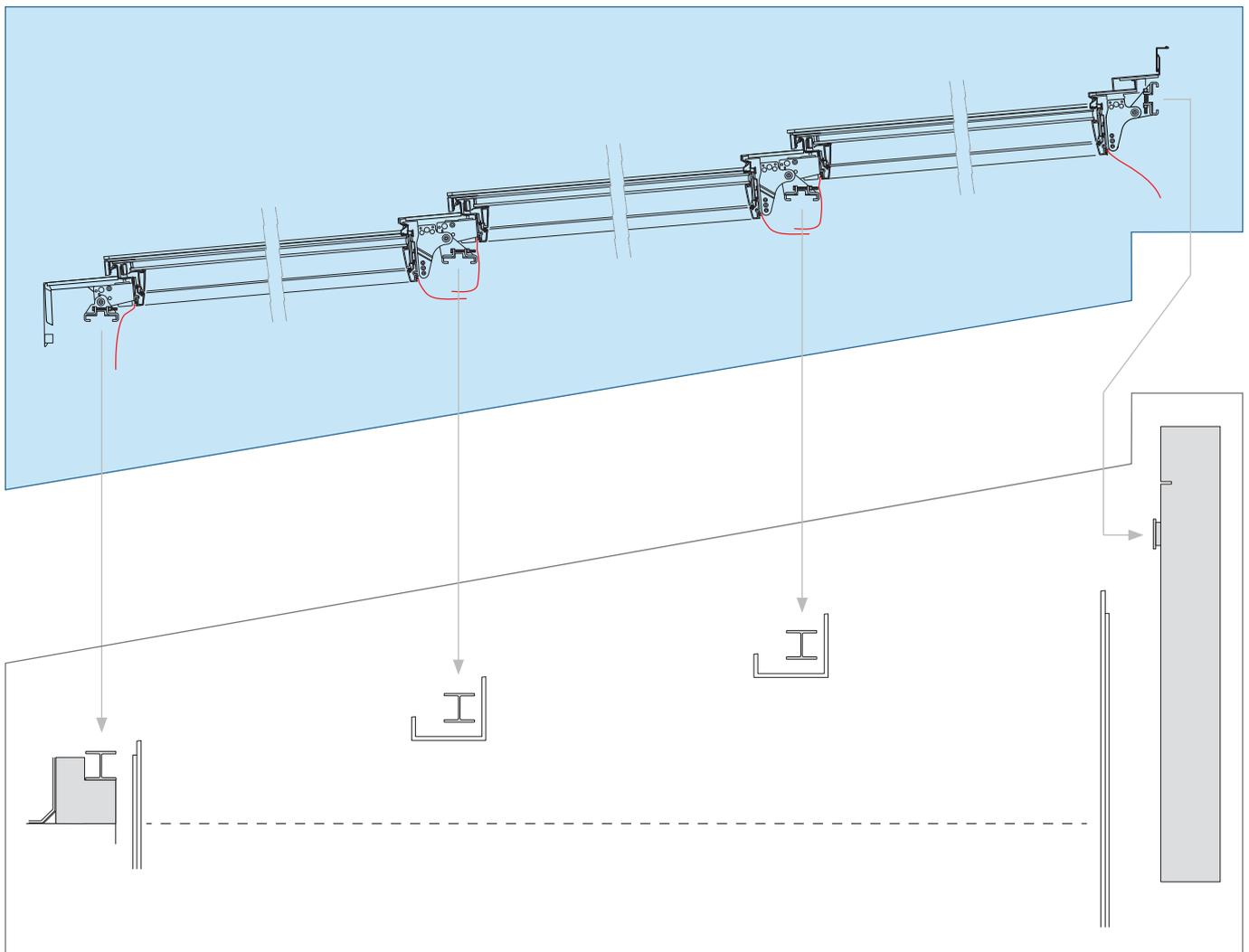
This is the Sub-construction document for Step Wall-mounted Longlight 5-25°. You are browsing the brochure now.

## Sub-construction for Step Wall-mounted Longlight 5-25°

VELUX modular skylights installed in a Step Wall-mounted Longlight solution are built on a sub-construction made of steel, concrete or wood. The sub-construction raises the modules above the roof surface, protecting the construction against water and drifting snow, and provides the supporting base for the modular skylights.

The sub-construction is not included in the VELUX delivery. The sub-construction as shown in the drawing only represents general principles and must be designed and dimensioned to fit the specific building project, local architectural style and practice, and the directions of other building suppliers.

### Step Wall-mounted Longlight 5-25° A delivery of VELUX Commercial



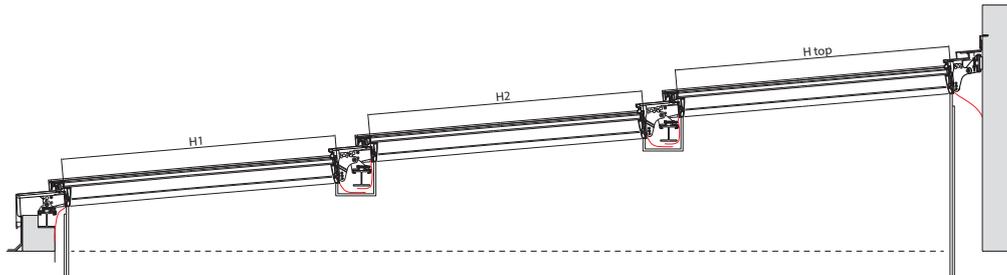
**On-site sub-construction**  
**This is not delivered by VELUX Commercial**

To ensure a high quality installation of VELUX modular skylights and to prevent condensation occurring within the sub-construction, it is highly recommended to install the BCX vapour barrier connection strip. The factory-finished BCX creates an easy connection between the VELUX modular skylights and the vapour barrier of the building. BCX is CE-marked in accordance with EN 13984.

## Numbering sequence for Step Wall-mounted Longlight modules

Numbering sequence	
H1	Module height – Always bottom module
H2 ...	Module height – Middle module 2, 3, ...
H top	Module height – Top module

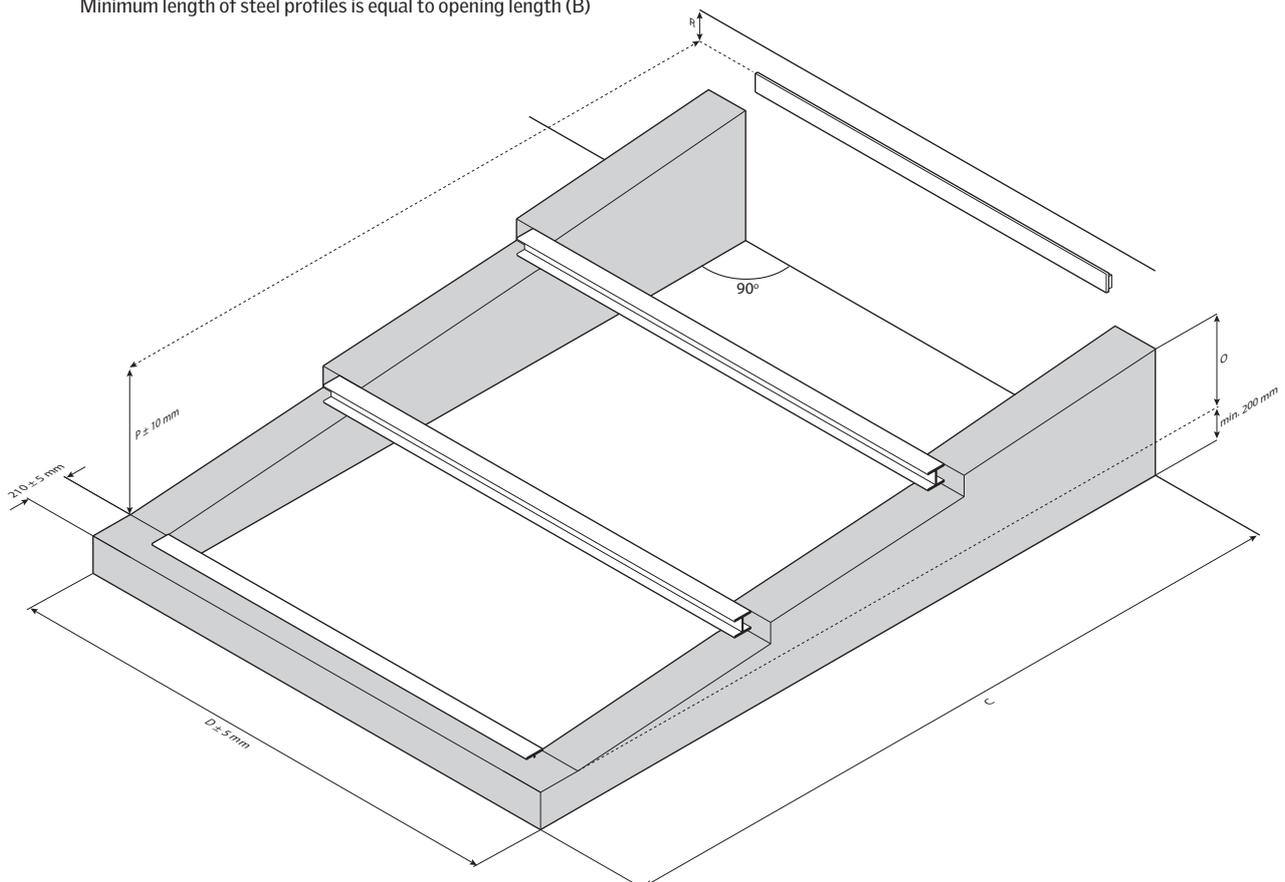
Example shows three rows with two steps



## Building site measurements – Axonometric

Axonometric	
C	Sub-construction width
D	Sub-construction length – Tolerance $\pm 5$ mm
O	Difference in height of sub-construction
P	Mounting height, wall steel profile. Measured from sub-construction to top of steel profile – Tolerance $\pm 10$ mm
R	Flashing groove placement – Tolerance $- 10$ mm, $+ 35$ mm. * Groove size: Height 8-10 mm, Depth 35 mm

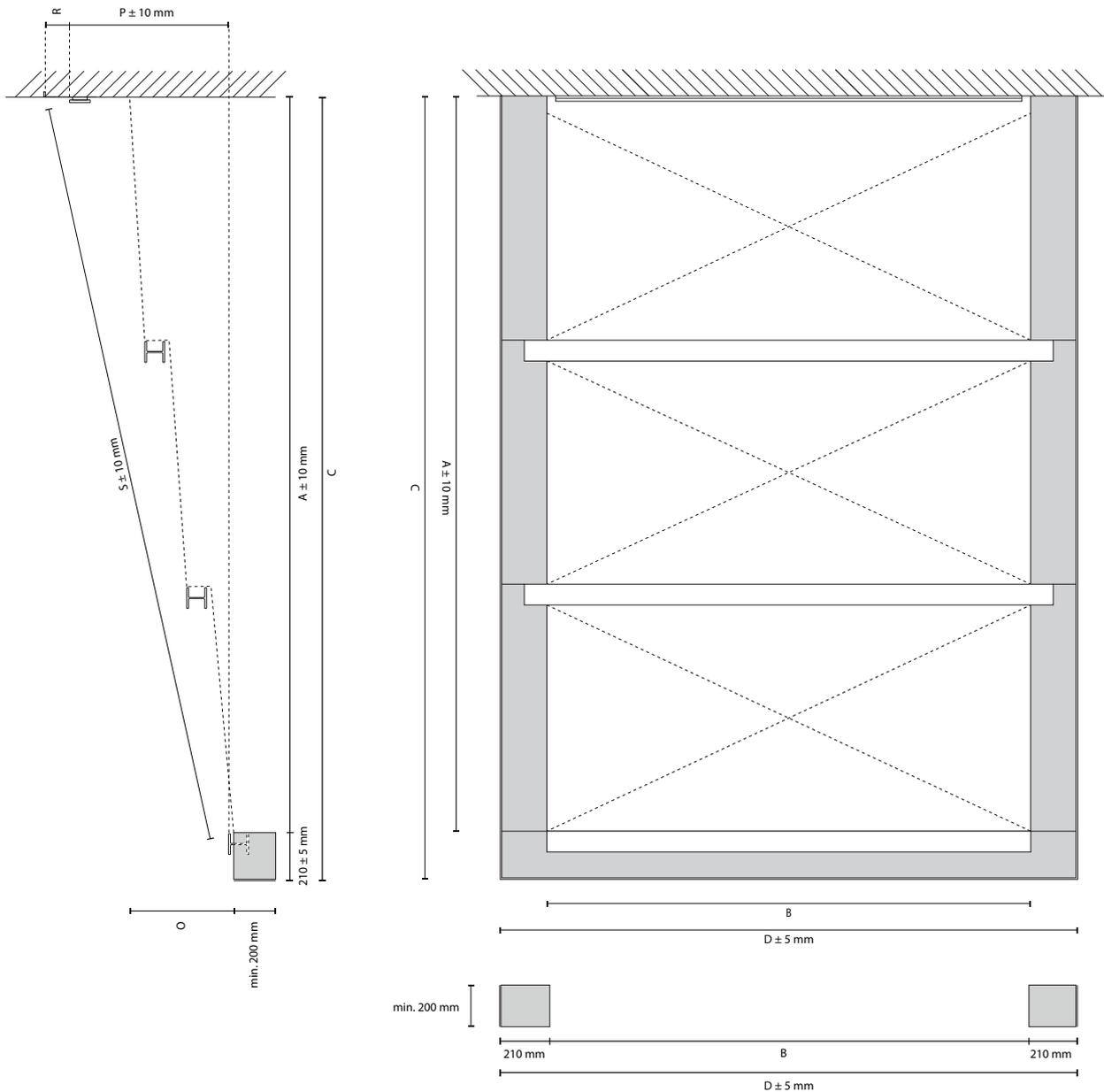
Minimum length of steel profiles is equal to opening length (B)



## Building site measurements

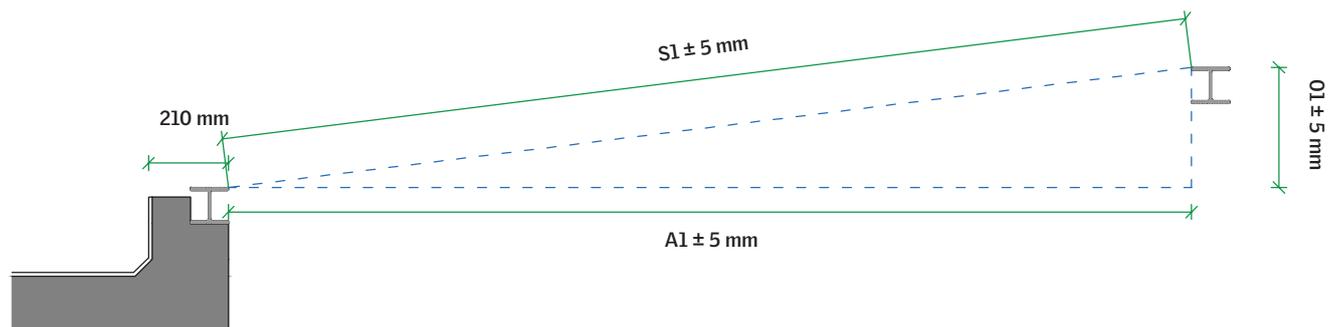
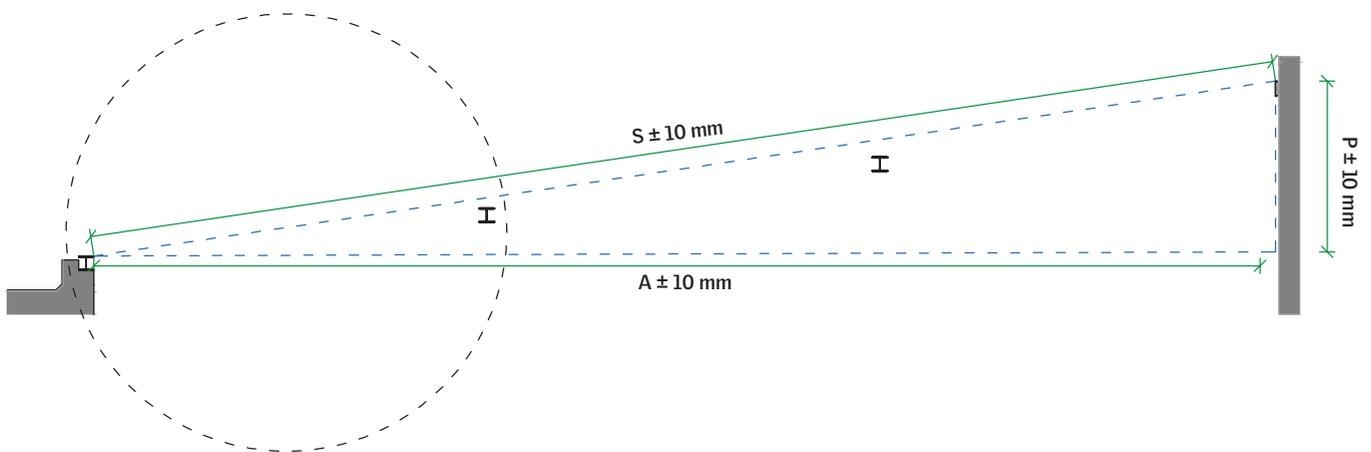
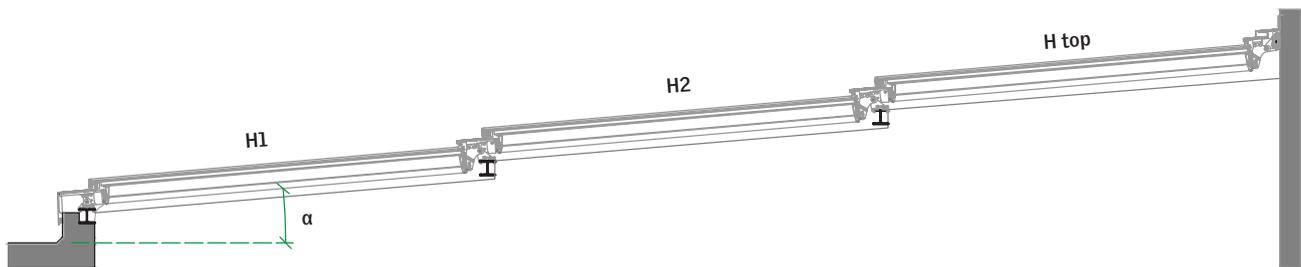
Plan	
A	Opening width – Tolerance $\pm 10$ mm
B	Opening length
C	Sub-construction width
D	Sub-construction length – Tolerance $\pm 5$ mm
O	Difference in height of sub-construction
P	Mounting height, wall steel profile. Measured from sub-construction to top of steel profile – Tolerance $\pm 10$ mm
R	Flashing groove placement – Tolerance $- 10$ mm, $+ 35$ mm. * Groove size: Height 8-10 mm, Depth 35 mm
S	Distance between steel, internal measurement between steel – Tolerance $\pm 10$ mm

Minimum length of steel profiles is equal to opening length (B)



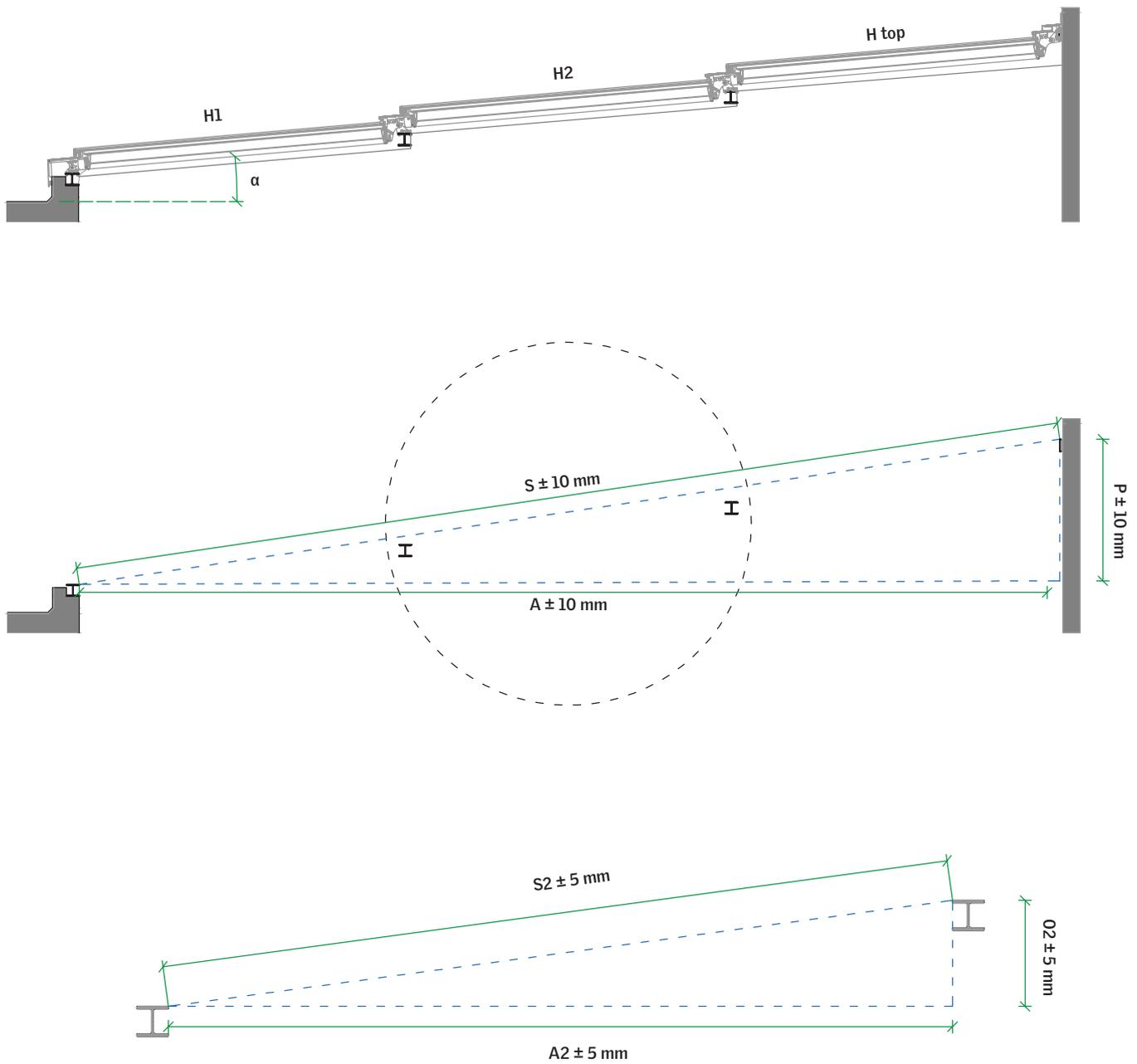
## Building site measurements – Cross-section, Bottom

Cross section, Bottom	
A1	Opening width, bottom row – Tolerance $\pm 5$ mm
S1	Distance between steel, internal measurement between steel in bottom row – Tolerance $\pm 5$ mm
O1	Difference in height of sub-construction in bottom row – Tolerance $\pm 5$ mm



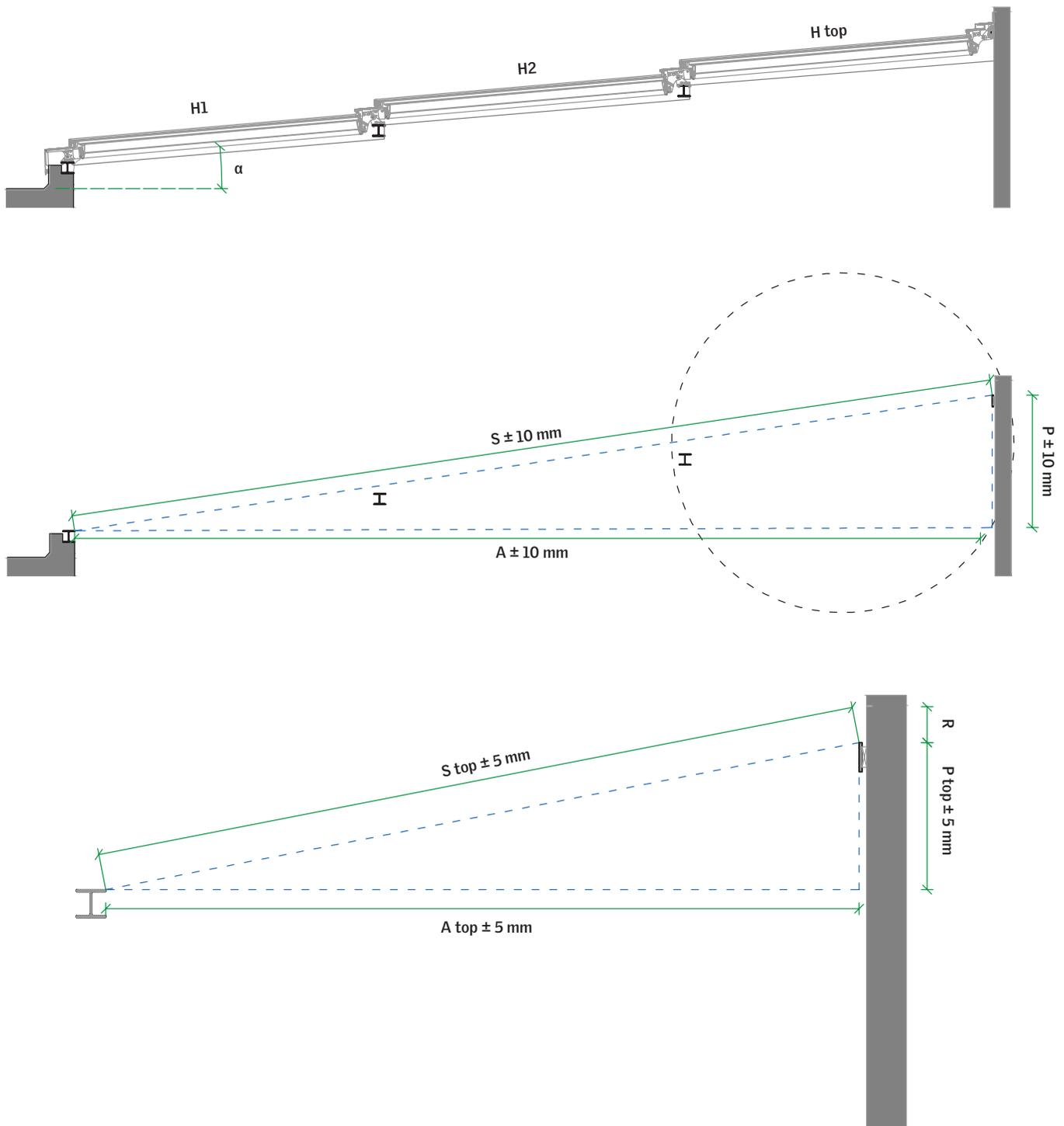
## Building site measurements – Cross-section, Middle

Cross section, Middle	
A2	Opening width, middle rows – Tolerance $\pm 5$ mm
S2	Distance between steel, internal measurement between steel in middle rows – Tolerance $\pm 5$ mm
O2	Difference in height of sub-construction in middle rows – Tolerance $\pm 5$ mm



## Building site measurements – Cross-section, Top

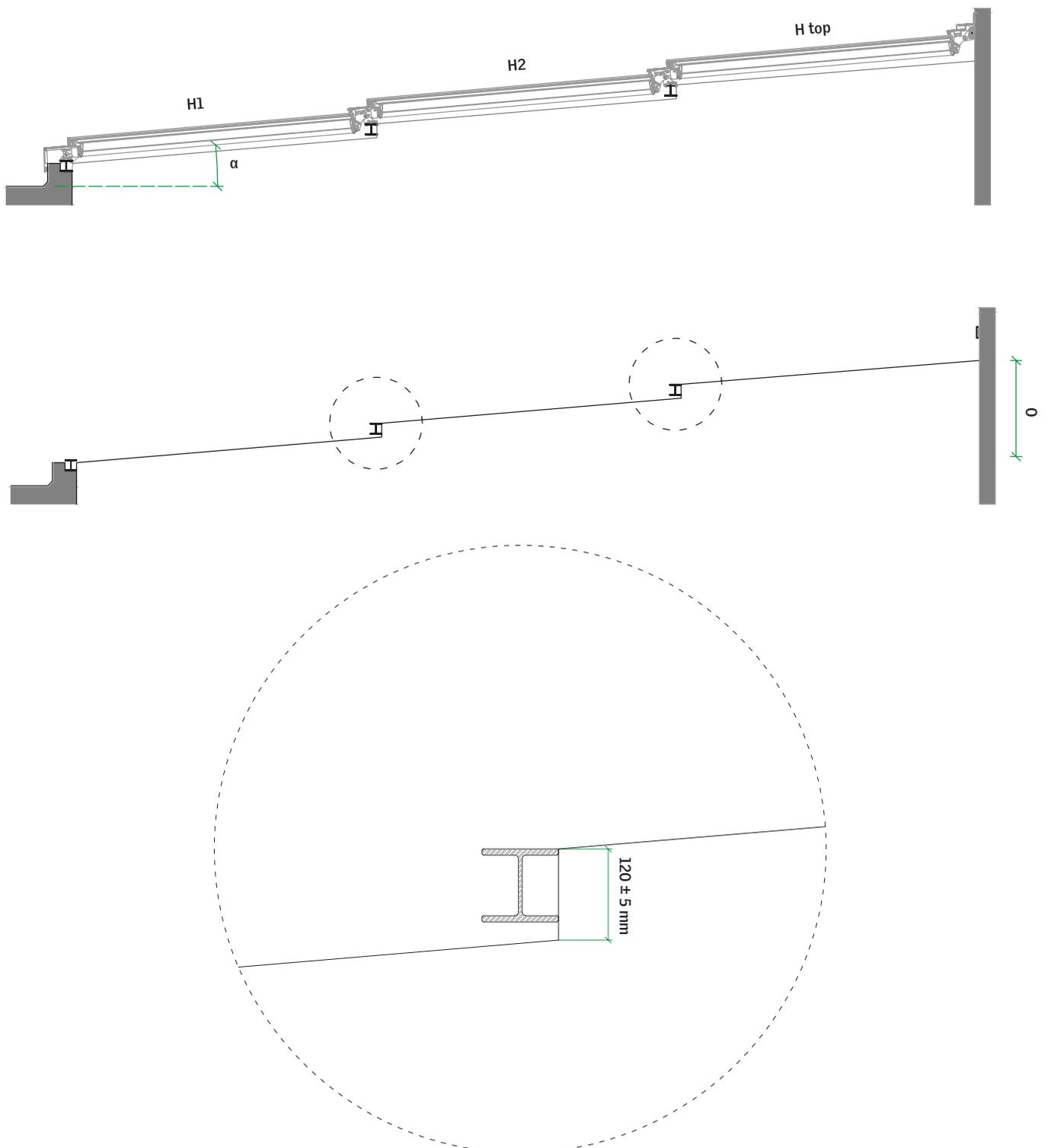
Cross section, Top	
A top	Opening width, top row – Tolerance $\pm 5$ mm
S top	Distance between steel, internal measurement between steel in top row – Tolerance $\pm 5$ mm
P top	Height distance between steel in top row – Tolerance $\pm 5$ mm
R	Flashing groove placement – Tolerance $- 10$ mm, $+ 35$ mm. * Groove size: Height 8-10 mm, Depth 35 mm



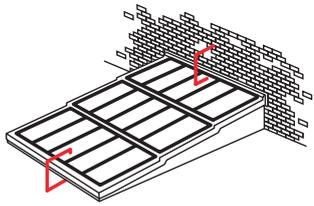
## Building site measurements – Cross-section, Gable

When designing the gable construction, it is important to be aware of the requirements to the step measurements to secure the correct installation of steel and flashings.

Cross section, gable	
0 Gable	Difference in height of sub-construction in all there rows



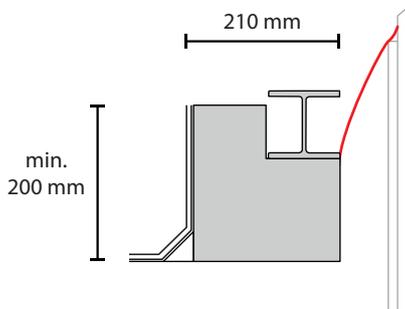
## Sub-construction variants



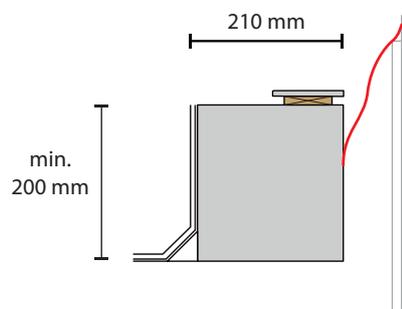
### Cross-section / Top and bottom

Options of sub-constructions for Step Wall-mounted Longlight solutions. Please note that the width stated indicates the distance from the exterior of the roofing material to the interior edge of the steel profile.

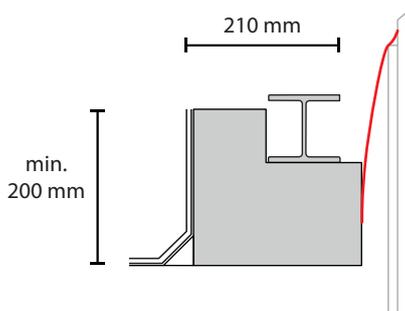
**Steel with steel profile**



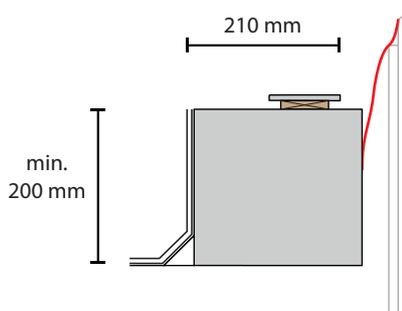
**Steel with flat steel**



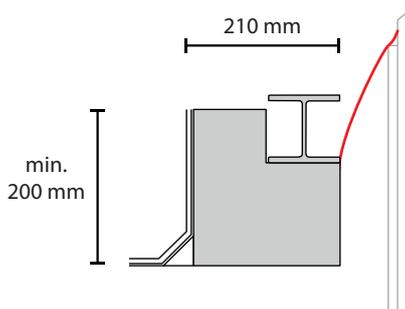
**Concrete with steel profile**



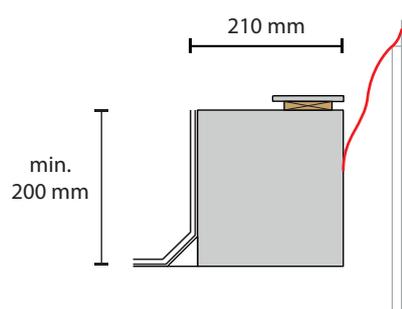
**Concrete with flat steel**



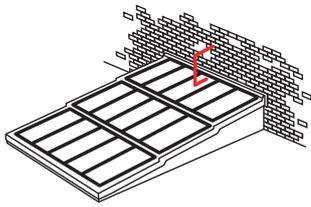
**Wood with steel profile**



**Wood with flat steel**

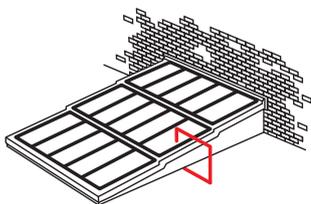
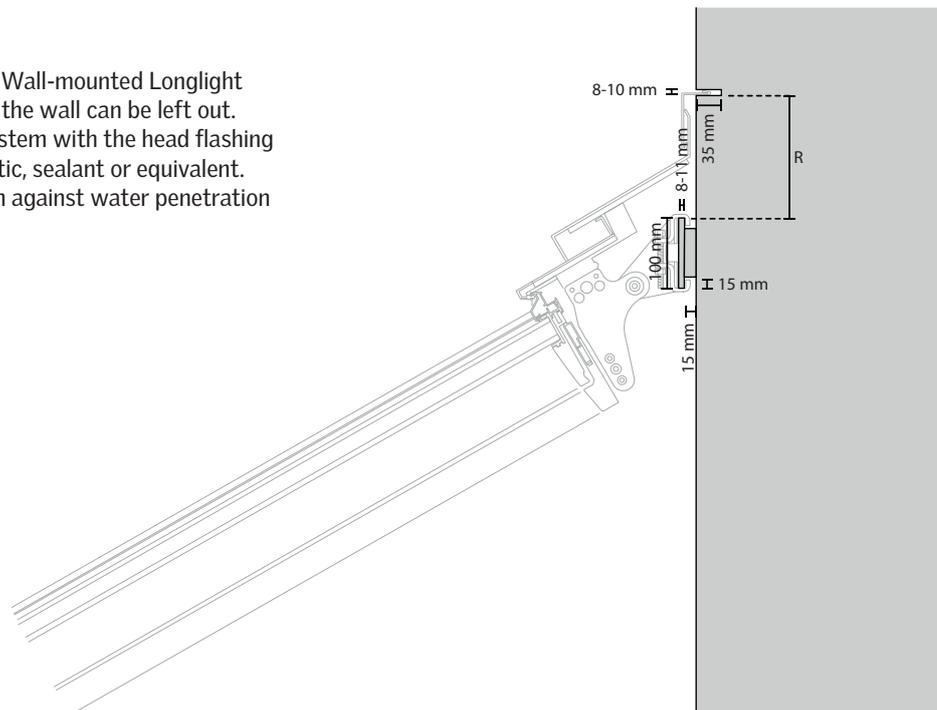


## Sub-construction variants



### Cross-section top

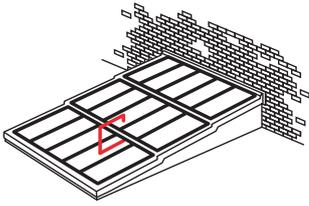
Options of sub-constructions for Step Wall-mounted Longlight solutions. Note, that the top groove in the wall can be left out. Making it a single water protection system with the head flashing sealed to the wall with a suitable mastic, sealant or equivalent. Making the sealant the only protection against water penetration from the wall above the skylight.



### Longitudinal section

In the gable construction for Step Wall-mounted Longlight at 5-25° pitch, the height of the sub-construction must be at least 200 mm measured from finished roof surface. It is important that the surface of the gable construction is suitable for fixation of screws.

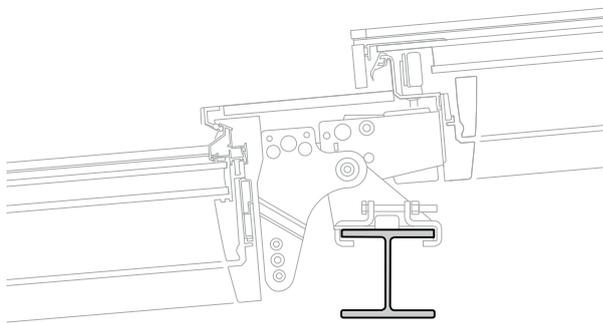




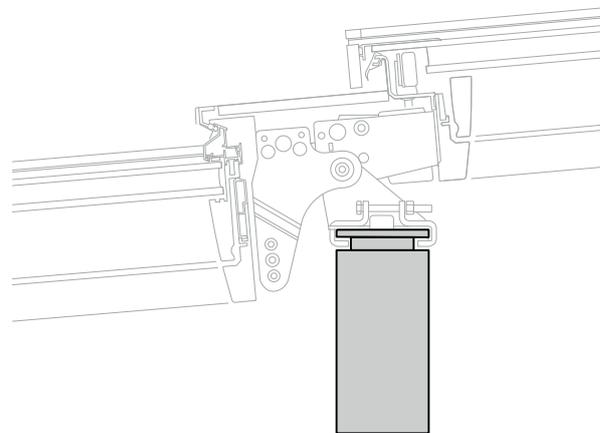
## Cross-section, middle

Options for sub-construction middle section.

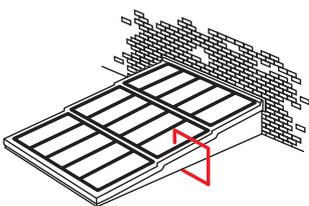
### Steel profile



### Beam with flat steel

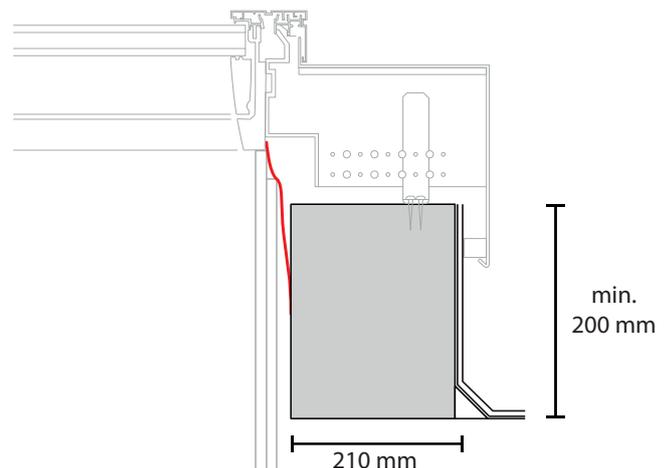


\*The load bearing beams can also be mounted perpendicular to the modules. In that case none of the numbers in this brochure will be correct. The new calculations shall be obtained from a VELUX Commercial sales office.



## Longitudinal section

In the gable construction for Step Wall-mounted Longlight 5-25° pitch, the height of the sub-construction must be at least 200 mm measured from finished roof surface. It is important that the surface of the gable construction is suitable for fixation of screws.

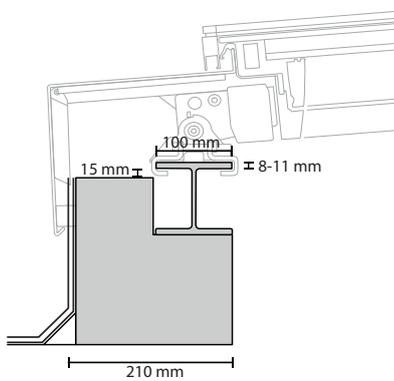


## Securing modular skylights to the sub-construction

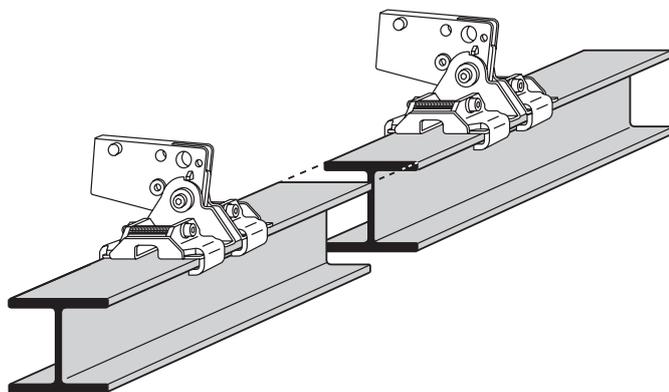
The sub-construction can be finished at the top and bottom with steel profile, which provides a level and stable surface for the skylight modules and forms a base for fitting mounting brackets with clamps.

### Using steel profile

When mounting the modular skylight on a steel profile, the top flange of the profile must be 100 mm in width and 8-11 mm in thickness. In addition there must be at least 15 mm free space underneath the flange both vertically and horizontally to give room for the clamp.



Steel, concrete or wood construction with steel profile

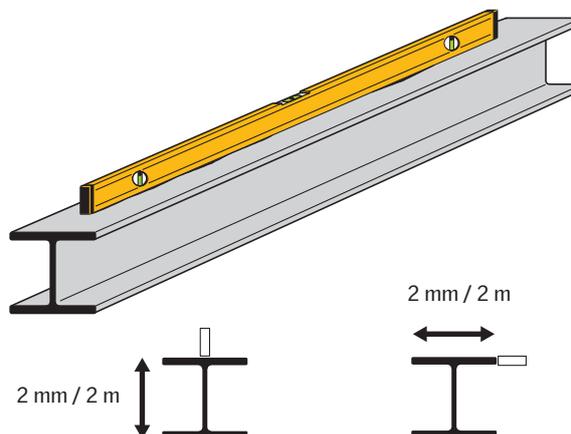


Connestion of steel profiles must not collide with clamps

**The number and size of fixings for securing the steel profile to the sub-construction must be dimensioned by the customer to fit each project.**

### Straightness of steel profile

Requirements as to the straightness of the steel profile are 2 mm per 2 meters both horizontally and vertically.



The following standard steel profiles are suited for installation of VELUX modular skylights in Step Wall-mounted Longlight solutions.

EU steel beams	British steel beams *	US steel beams *
INP 220	UB 178 x 102 x 19	W 12 x 22
IPE 200	UB 203 x 102 x 23	W 12 x 19
HE100A	UB 254 x 102 x 22	W 10 x 19
HE100B	UB 254 x 102 x 25	W 10 x 17
	UB 305 x 102 x 25	W 8 x 15
	UB 305 x 102 x 28	W 6 x 16
	UB 305 x 102 x 33	W 4 x 13 **
		S 8 x 23 ***
		S 8 x 18.4

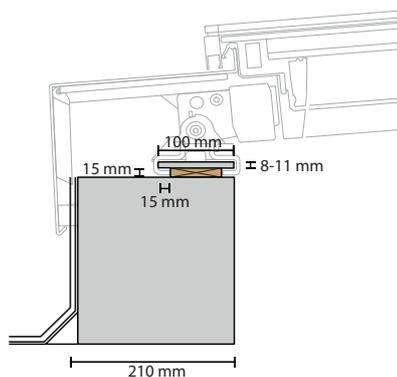
\*) The steel profile for British UB and US beams may not be used for installing in a slope declining more than 23°.

\*\*\*) The US steel profile W 4x13 may not be used for installing in a slope declining more than 22°.

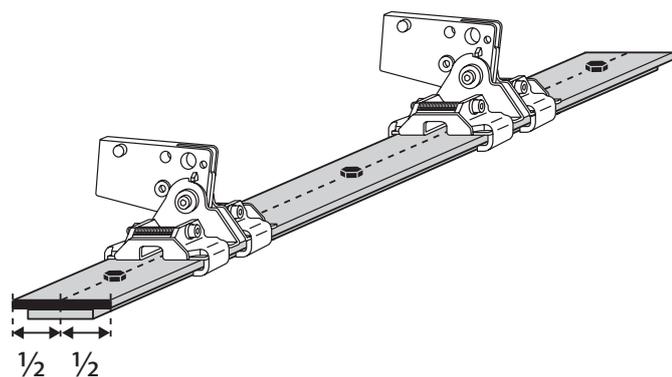
\*\*\*\*) The US steel profile S 8x23 may not be used for installing in a slope declining more than 19°.

## Using flat steel profile

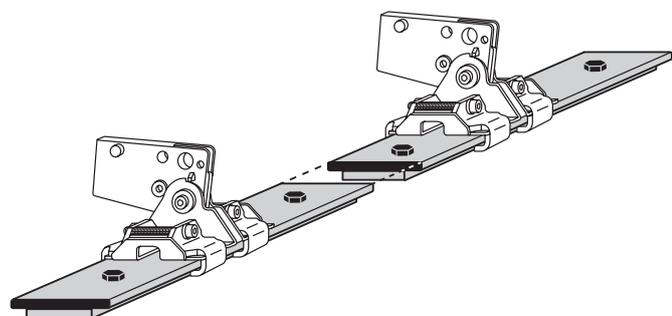
When the sub-construction is finished with a flat steel profiles, the steel profile must be 100 mm in width and 8-11 mm in height. In addition there must be at least 15 mm free space underneath the steel both vertically and horizontally to give room for the clamps.



Steel, concrete or wood construction with flat steel



- The distance pieces under the flat steel profile must be for the full length of the steel profile
- The flat steel profile must be secured using screws along the middle of the steel profile

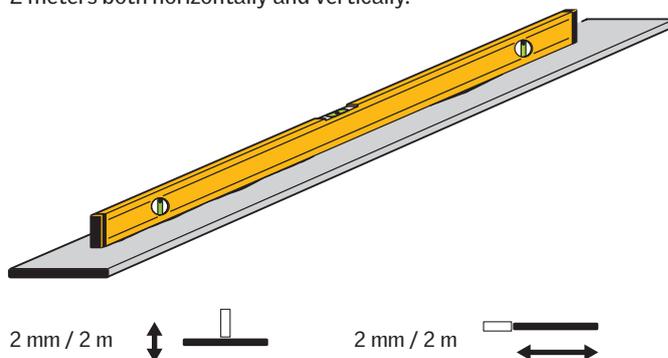


- Connection of flat steel profiles must not collide with clamps

**The number and size of fixings for securing the flat steel profile to the sub-construction must be dimensioned by the customer to fit each project.**

## Straightness of steel profile

Requirements as to the straightness of the flat steel are 2 mm per 2 meters both horizontally and vertically.



The following standard flat steel profiles are suited for installation of VELUX modular skylights in Step Wall-mounted Longlight solutions.

Standard EU flat steel	Standard US flat steel
100 x 8	5/16 x 4
100 x 10	3/8 x 4

## Using wooden battens

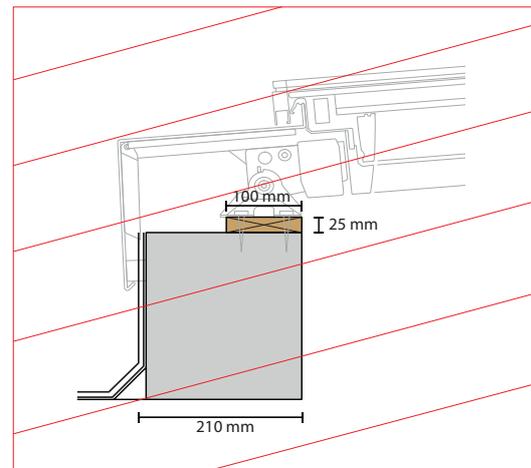
The sub-construction for Step Wall-mounted Longlight can also be finished with the use of a wooden batten on which the mounting brackets of the modular skylight can be secured directly, without having to use the mounting clamps.

The skylight modules are mounted on the batten using screws through the bottom and top mounting brackets.

There are 4 holes in each mounting bracket, 2 x  $\phi 5$  and 2 x  $\phi 8.5$ .

**These screws are not included in the VELUX delivery, and the correct dimensions must be ensured by the customer.**

**Not recommended by VELUX Commercial**

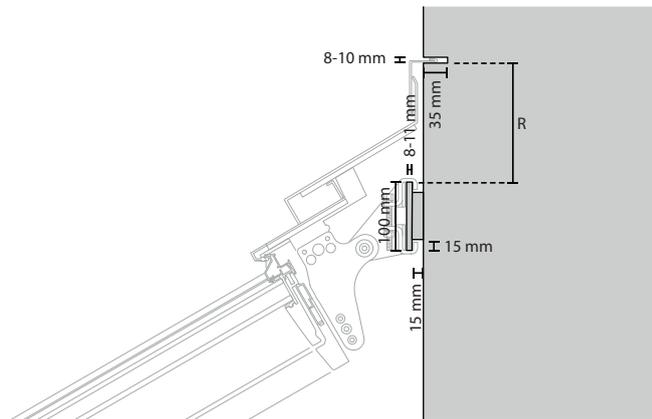


Steel, concrete or wood construction with wooden batten

## Securing modular skylights to the wall

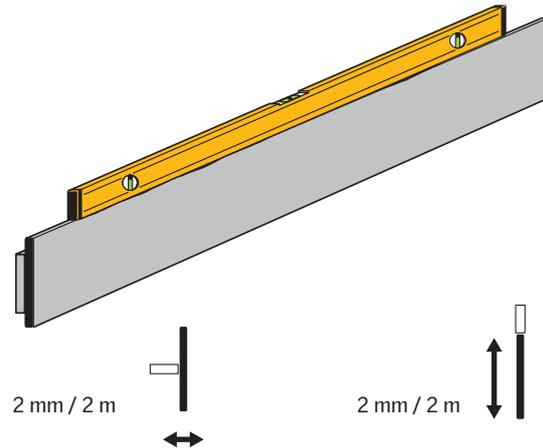
### Flat steel profile

Step Wall-mounted modular skylights must be mounted on a flat steel profile on the wall. The steel profile must be 100 mm wide and 8-11 mm thick. There must be at least 15 mm free space underneath the steel, both vertically and horizontally to allow room for the clamps.



### Straightness of steel profile

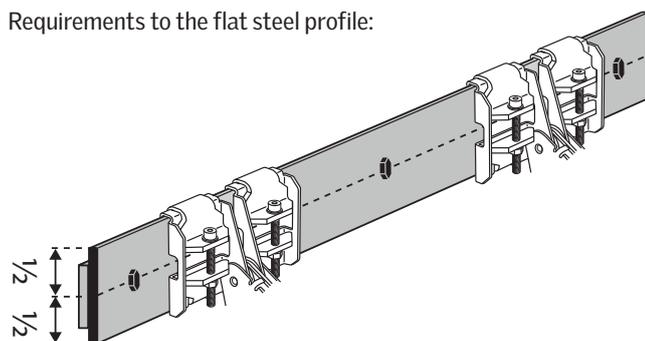
Requirements as to the straightness of the flat steel are 2 mm per 2 meters both horizontally and vertically.



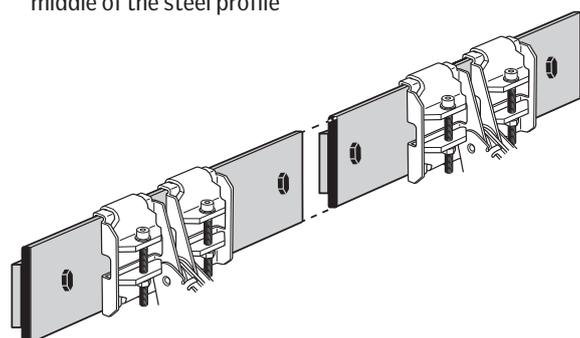
### Steel, concrete or wood construction with flat steel profile

**The number and size of fixings for securing the steel profile to the building must be dimensioned by the customer to fit each project.**

Requirements to the flat steel profile:



- The blocking-up of the steel must be in the full length of the steel profile
- The steel profile must be secured using screws or bolts along the middle of the steel profile



- Connection of steel profiles must not collide with clamps

The following standard flat steel profiles are suited for installation of VELUX modular skylights in Step Wall-mounted Longlight solutions.

Standard EU flat steel	Standard US flat steel
100 x 8	5/16 x 4
100 x 10	3/8 x 4

In case a stronger construction is needed, the steel profile can be replaced with a stronger profile. In this case, longer installation bolts must be ordered separately from a VELUX Commercial sales office.

The following flat steel profiles can be used combined with the longer bolts.

Standard EU flat steel	Standard US flat steel
110 x 8	3/8 x 4 1/2
110 x 10	
120 x 8	
120 x 10	

## Connecting flashing to the wall

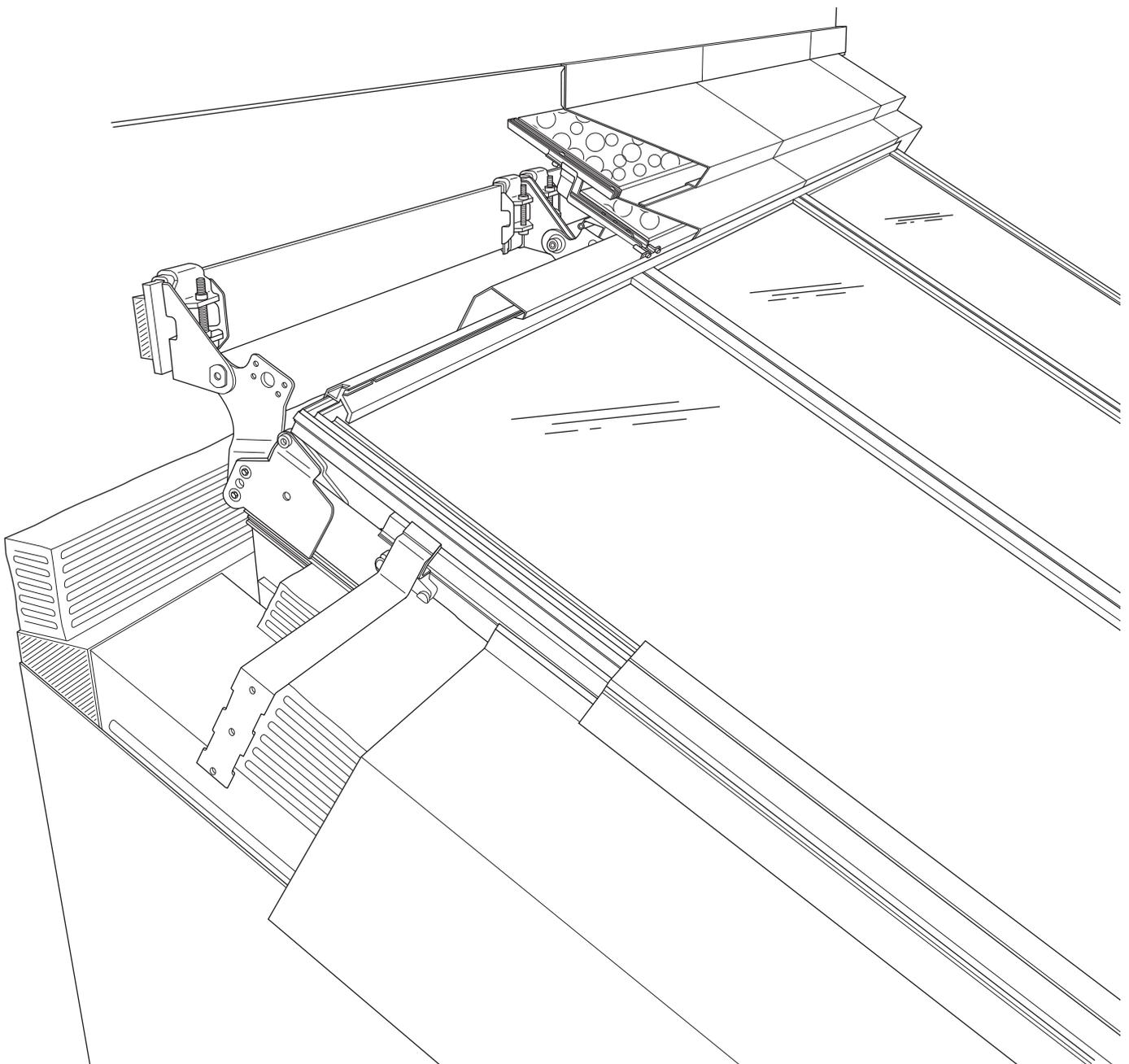
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The surface of the wall must be suited for fixing screws, cutting a groove in and applying mastic or sealant to. These must be prepared according to applicable standards.

When cutting a groove for the top head flashing, the groove must subsequently be sealed again.

If the wall is not suited for cutting a groove, the top head flashing is left out, and the main head flashing is secured to the wall using a sealant. In this case, the sealant is the only water protection. The choice of sealant to use in the groove and on the flashing must be according to national requirements, local practice, and the directions of other building suppliers.

The sealant is not part of the VELUX delivery.

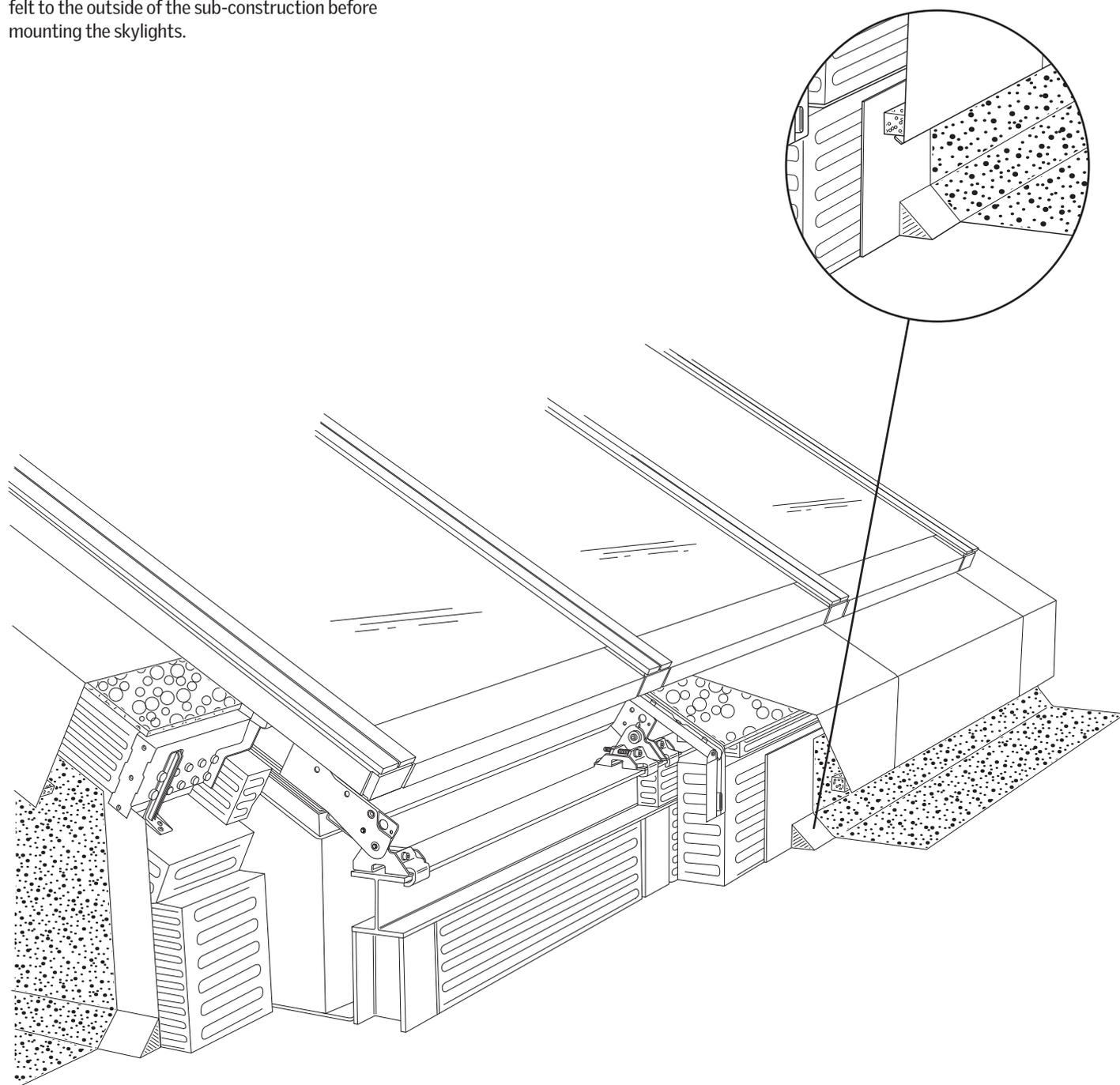


## Connecting to the roof

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The surface on which roofing felt is laid must be prepared according to applicable standards for roofing materials and best building practice.

The ideal installation order, is to apply the roofing felt to the outside of the sub-construction before mounting the skylights.

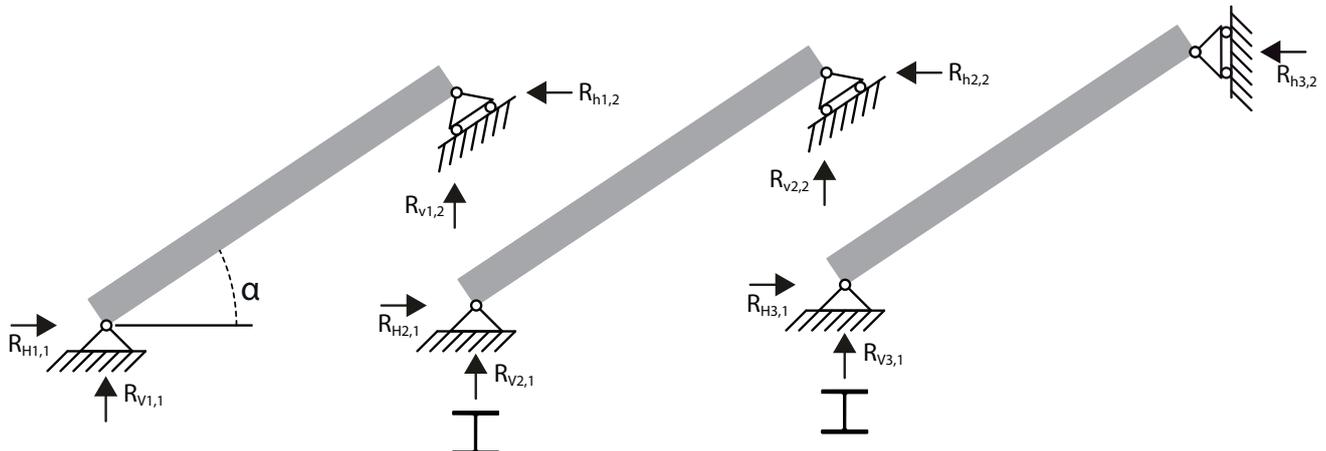


## Static information for dimensioning

As an additional service, VELUX Commercial offers to provide static calculation for the skylight solution based on the actual loads given by the customer. For static calculation please contact a VELUX Commercial sales office.

en by the customer. For static calculation please contact a VELUX Commercial sales office.

### Static model of reactions

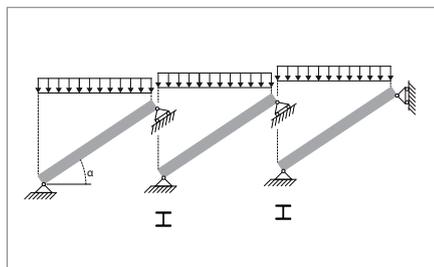


### Characteristic loads

Fill out please

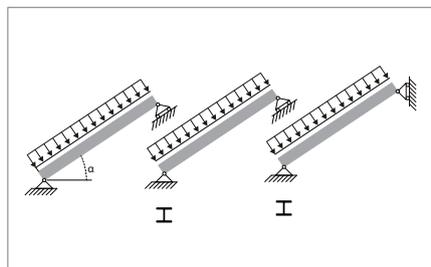
Name of your project:

Snowload pressure in kN/m<sup>2</sup>



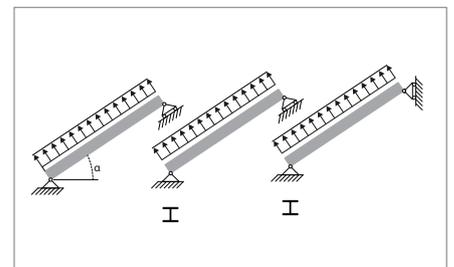
kN/m<sup>2</sup>

Windload pressure in kN/m<sup>2</sup>



kN/m<sup>2</sup>

Windload suction in kN/m<sup>2</sup>

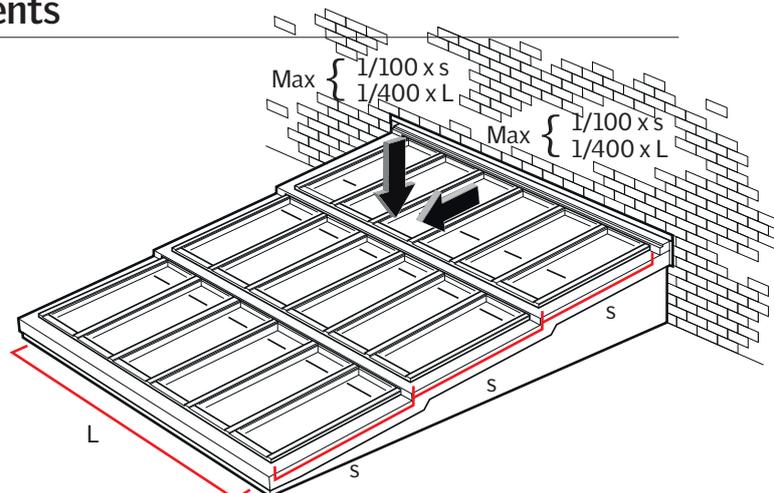


kN/m<sup>2</sup>

## Sub-construction dimensioning requirements

The roof construction is subject to deflection after installation of the skylight modules. These deflections includes subsequent roof covering, various building installations and external loads such as snow and wind etc. The sub-construction must be designed to withstand all these loads and the deformations must be limited to the maximum of  $1/100 \times s$  or  $1/400 \times L$ .

After completing the sub-construction, it must be secured against water penetrating the roof construction and insulation.



VELUX Group  
VELUX Commercial  
Ådalsvej 99  
2970 Hørsholm  
Denmark

Web: [veluxcommercial.com](http://veluxcommercial.com)  
Blog: [commercial.velux.com/blog](http://commercial.velux.com/blog)

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