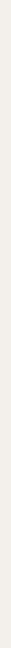


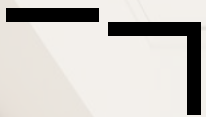
Design Guide

Flat roof

Design Guide

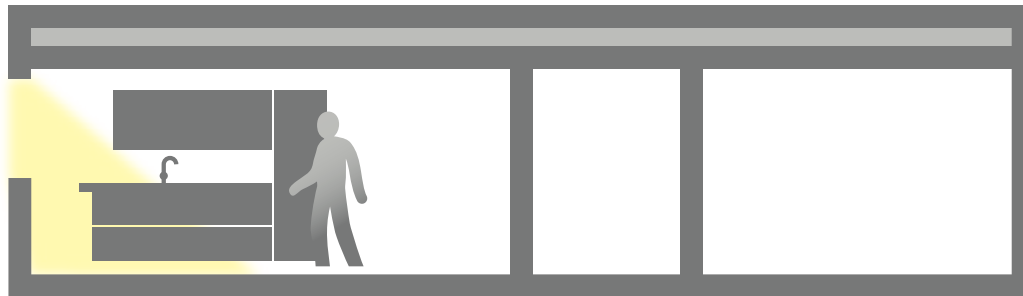


01/ Basics



1.1 /Basic design rules

Optimal indoor climate design under flat roof



Max. daylighted area
from facade window 3,5 m

No sufficient
daylight



light

Air exchange
in the room
1.5x per hour



ventilation

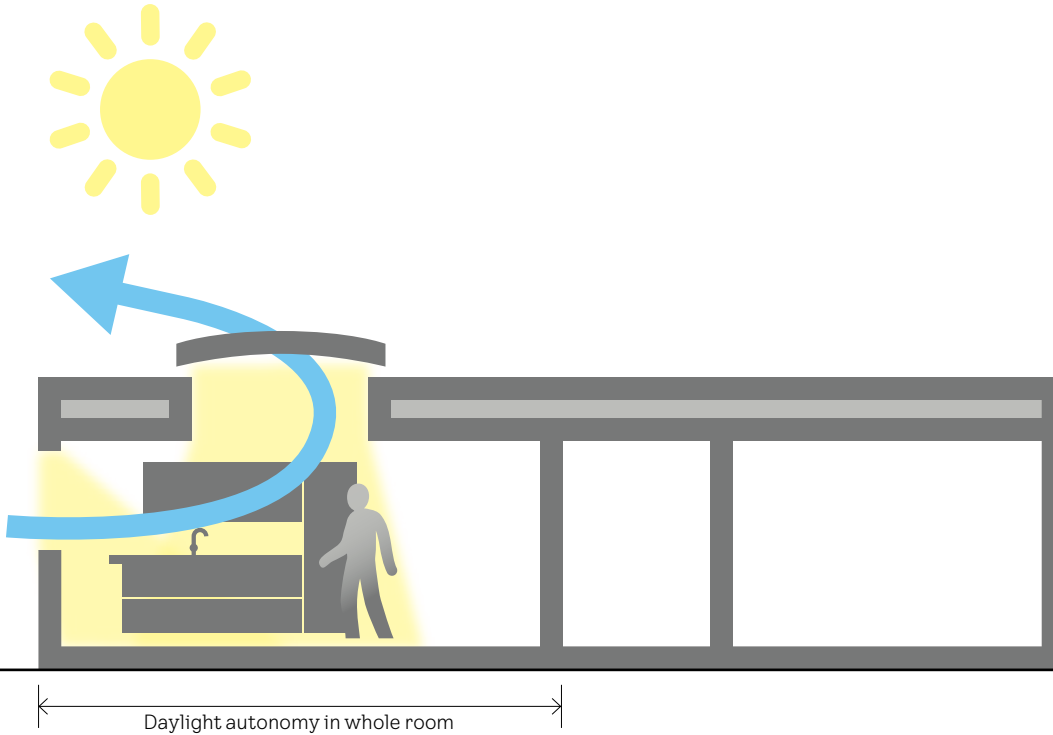
Cramped,
dark space



comfort

1.1 /Basic design rules

— Optimal indoor climate design under flat roof



Modern solutions:
targeted top light
to the work area



light

Air exchange
in the room
2.5× per hour



ventilation

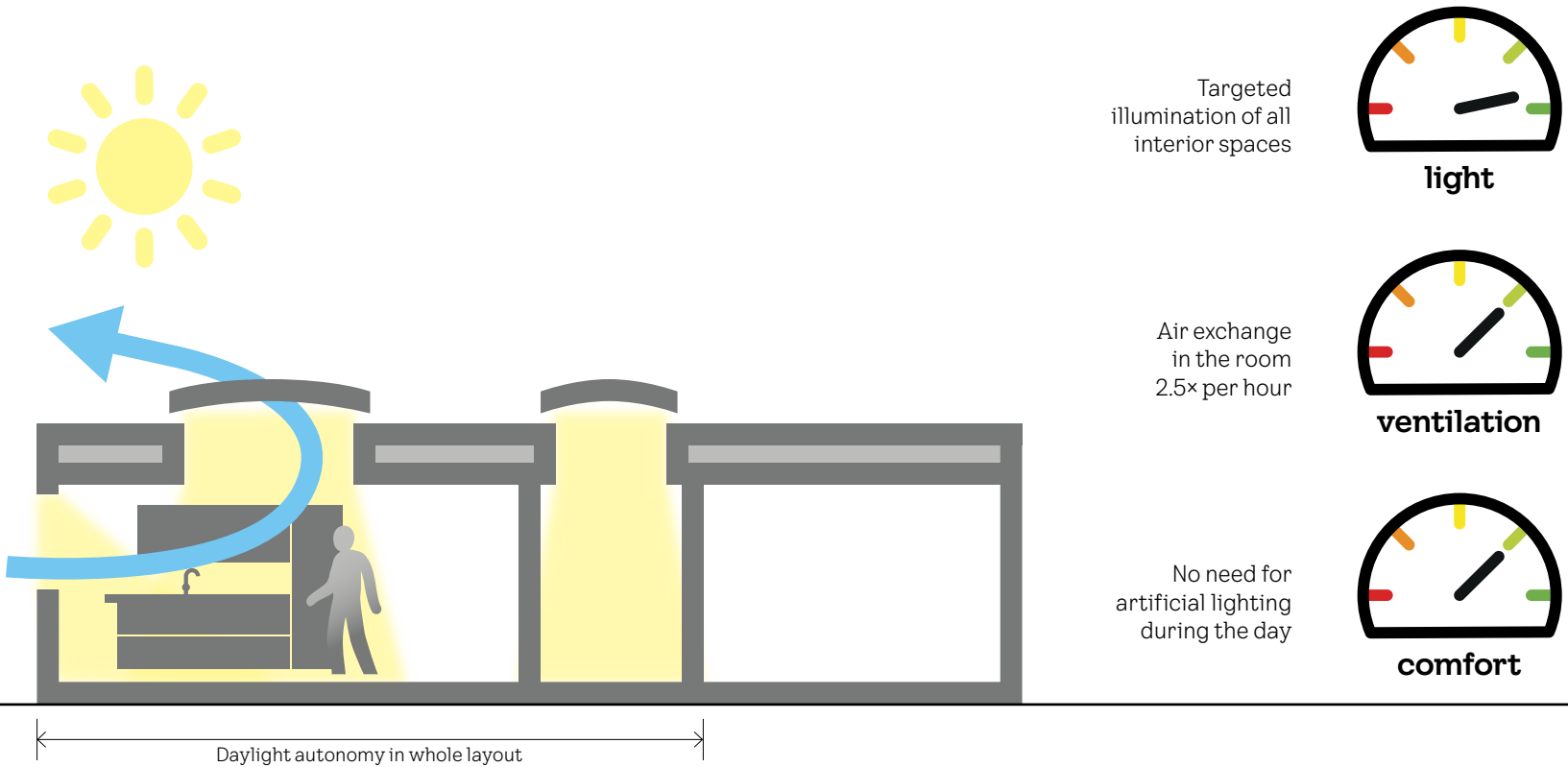
Great visual
impression, greater
psychological
well-being



comfort

1.1 /Basic design rules

— Optimal indoor climate design under flat roof



1.2 /Basic daylight needs

Daylight needs fulfilled by targeted daylight through the roof



Daylight needs not fulfilled



Daylight needs:



Working desk
kitchen
500 lux



Dining
dining room
300 lux



Reading
living room
500 lux



Daylight needs solved by rooflights

1.3 /Daylight recommendation

European Standard for daylight in buildings EN 17037

The European Standard for daylight in buildings recommends that a certain amount of daylight (300, 500 or 750 lux) is available for 50% of daylight hours during the year, over 50% of the relevant work plane area.

These requirements can be evaluated with climate-based annual simulations (method 2), or daylight factor simulations (with daylight factor targets corresponding to illuminance values) (method 1).

*

Country	Capital	D 300 lx	D 500 lx	D 750 lx
Turkey	Ankara	1,60%	2,60%	3,90%
Bulgaria	Sofia	1,60%	2,70%	4,00%
Romania	Bucharest	1,60%	2,70%	4,10%
Croatia	Zagreb	1,80%	2,90%	4,40%
Slovenia	Ljubljana	1,80%	2,90%	4,40%
Hungary	Budapest	1,70%	2,80%	4,10%
Slovakia	Bratislava	1,80%	3,10%	4,60%
Czech R.	Prague	2,00%	3,40%	5,00%
Poland	Warsaw	2,00%	3,40%	5,10%
UK	London	2,10%	3,50%	5,30%
Lithuania	Vilnius	2,00%	3,30%	4,90%
Latvia	Riga	2,20%	3,70%	5,50%
Estonia	Tallinn	2,20%	3,70%	5,50%

EN 17037 recommendations for daylight availability

Target illuminance (lux) or daylight factor levels

50% of daylight hours during the year

50% of the relevant work plane area

Method 1.

Target daylight factor levels for daylight factor simulations

2.1%
United Kingdom (LOW)

3.5%
United Kingdom (MEDIUM)

5.3%
United Kingdom (HIGH)

Method 2.

Target illuminance (lux) levels for climate-based annual simulations

300 lux
(LOW)

500 lux
(MEDIUM)

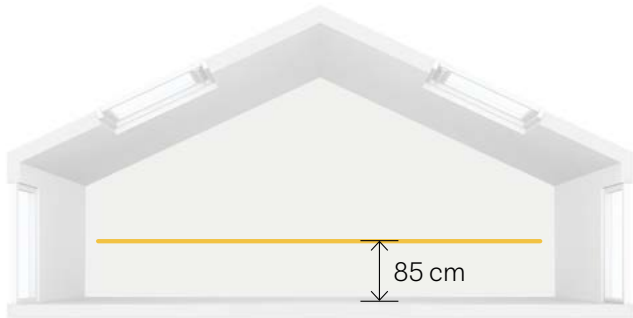
750 lux
(HIGH)

1.3 /Daylight recommendations

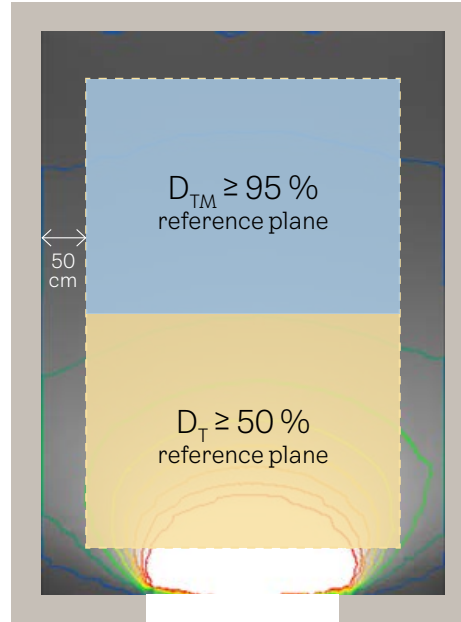
Criteria for daylight provision

D_T Target daylight factor
 $\geq 50\%$ reference plane

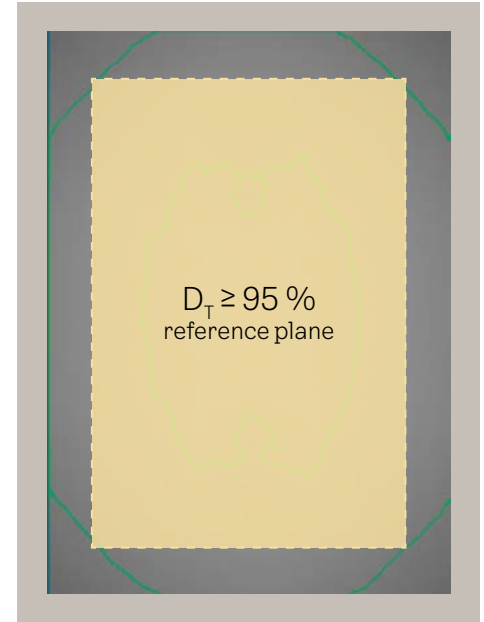
D_{TM} Minimum target daylight factor
 $\geq 95\%$ reference plane



Reference plane



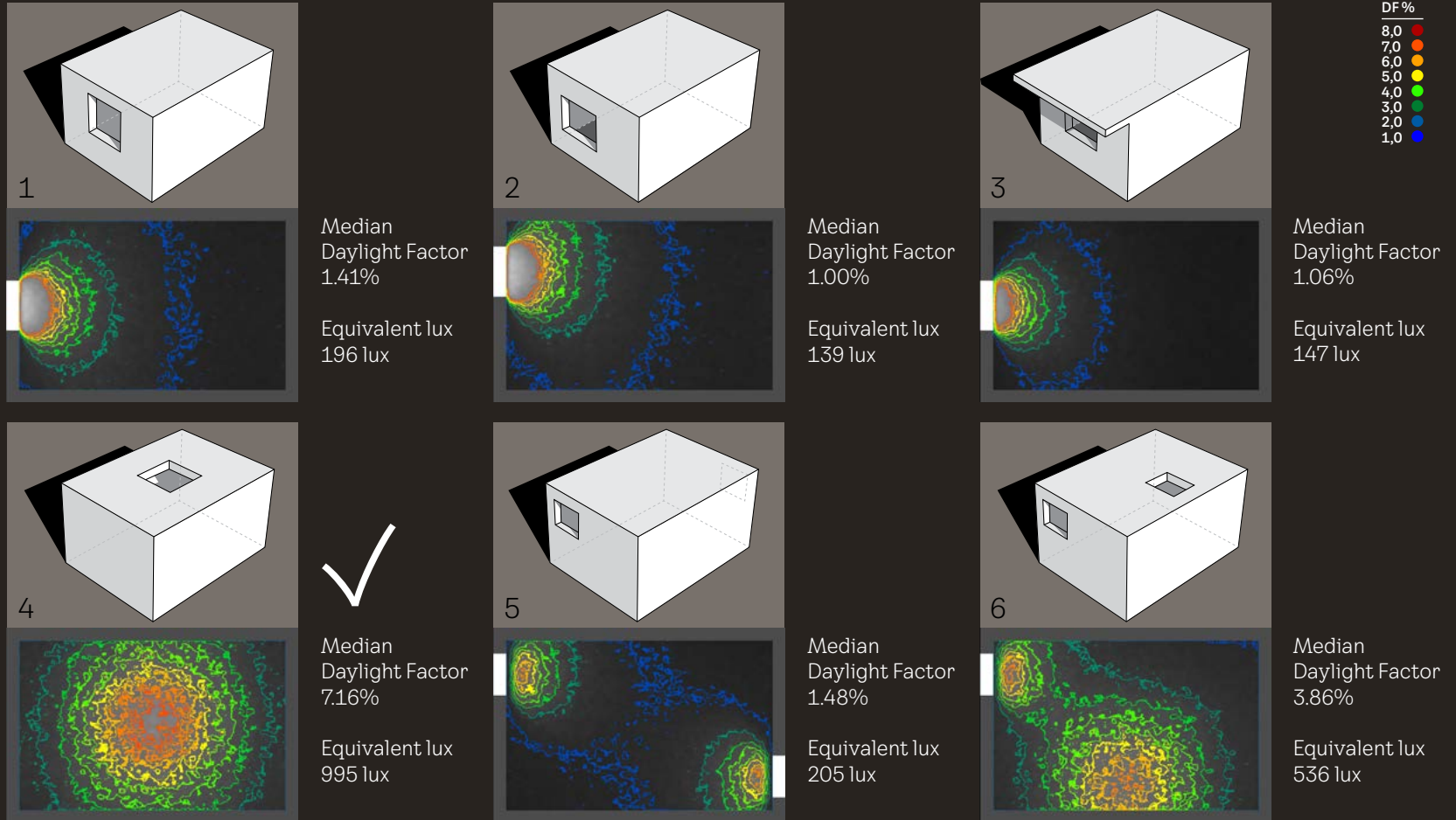
Interiors with opening in vertical and slope.



Interiors with a nearly horizontal opening.

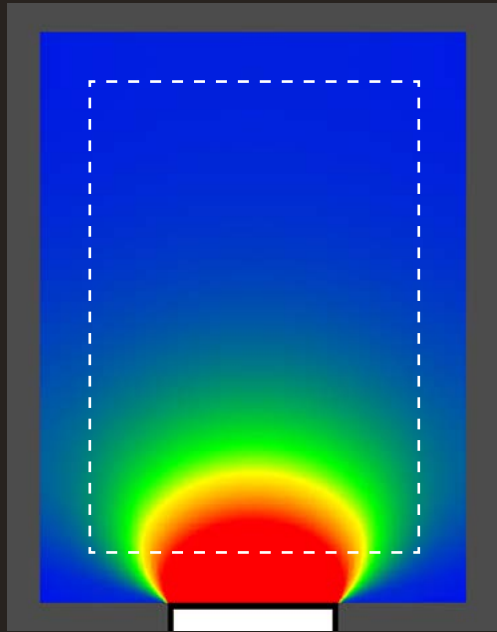
1.3 /Daylight recommendations

Daylight factor comparison for 3 rooms with 10% glazing to floor area ratio



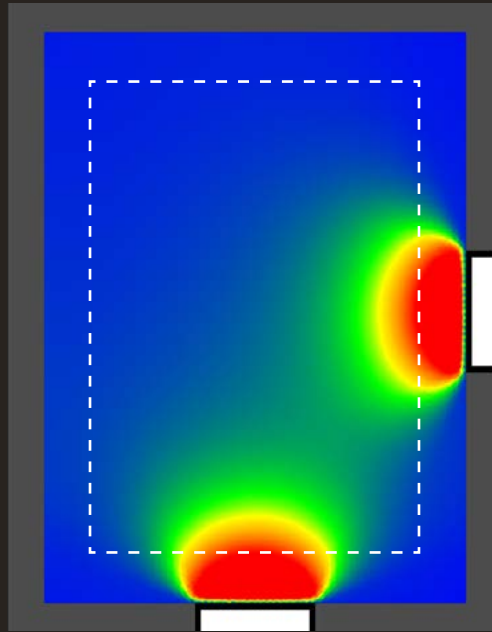
1.3 /Daylight recommendations

Daylight factor comparison for 3 rooms with 10% glazing to floor area ratio



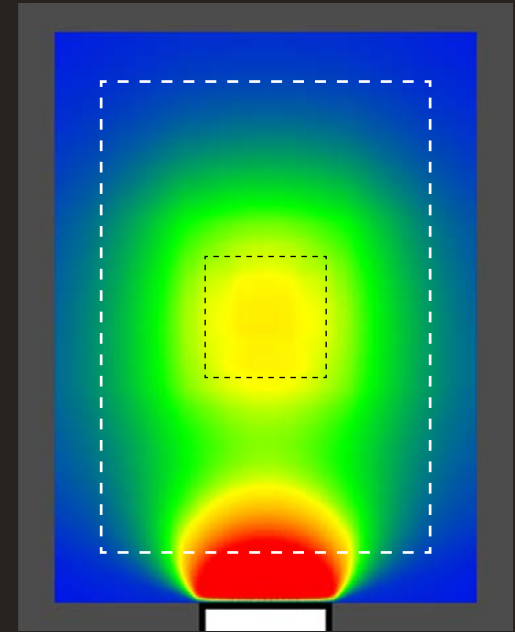
10% glazing to floor area ratio
distributed on one facade

Median daylight factor (DF) = 0.99%
Below EN 17037 recommendation



10% glazing to floor area ratio
distributed on two facades

Median daylight factor (DF) = 1.22%
Below EN 17037 recommendation



10% glazing to floor area ratio
distributed on one facade and the roof

Median daylight factor (DF) = 3.05%
Above EN 17037 recommendation



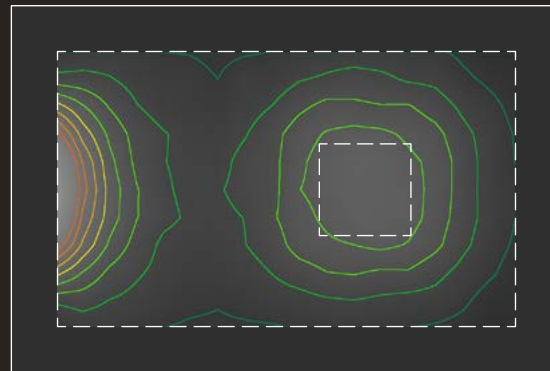
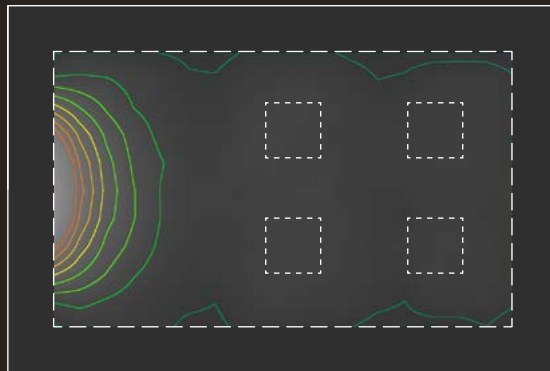
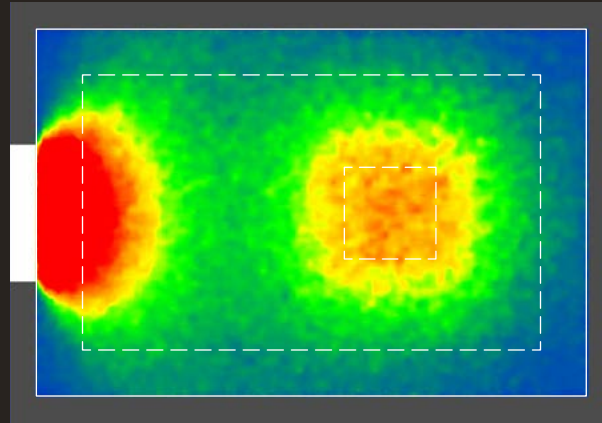
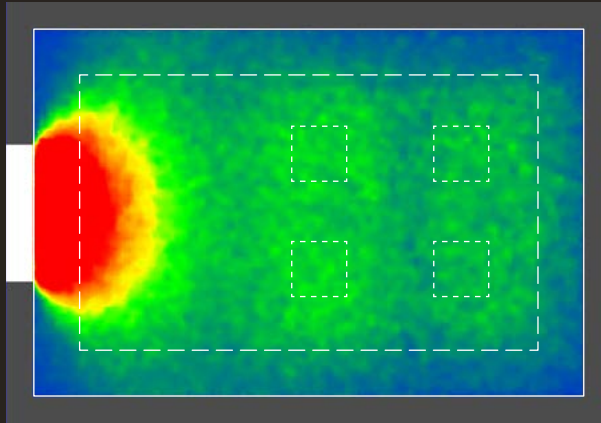
**Top light offer best daylight
distribution to fulfill Daylight Standard**

1.4 / Daylight distribution / size

Rooflight size impact to daylight distribution

4x rooflight 600/600

1x rooflight 1000/1000



EN17037

$F_{plane, \% \geq 50\%}$ (median)	DT	2.16 DF[%]	322 lux
$F_{plane, \% \geq 95\%}$	DTM	1.64 DF[%]	244 lux

EN17037

$F_{plane, \% \geq 50\%}$ (median)	DT	2.65 DF[%]	395 lux
$F_{plane, \% \geq 95\%}$	DTM	1.57 DF[%]	235 lux

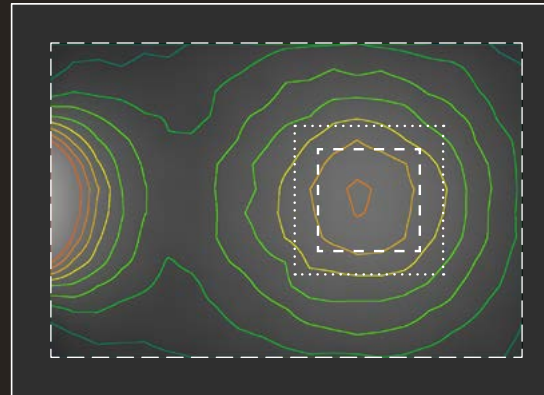
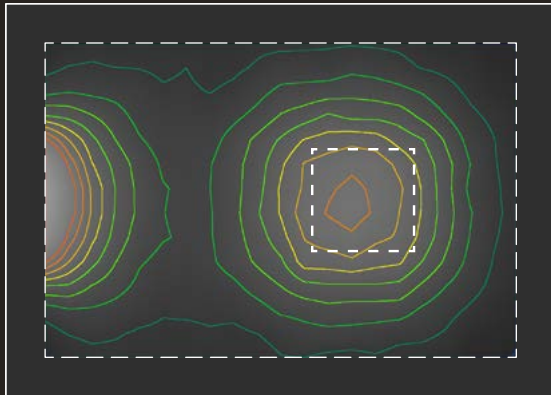
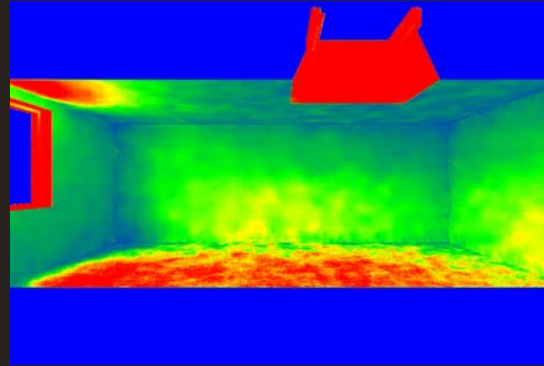
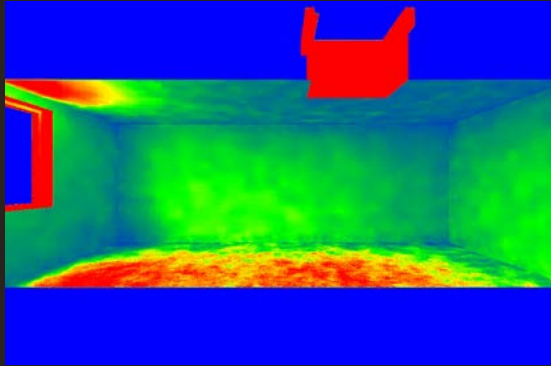
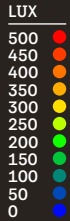
One big roof-light provides more daylight than more small ones

1.5 / Daylight performance / lining shape

Lining shape influence daylight distribution

Narrow lining

Open lining



EN17037

EN17037

$F_{plane, \% \geq 50\%}$ (median)	DT	2.15 DF[%]	321 lux
$F_{plane, \% \geq 95\%}$	DTM	1.12 DF[%]	167 lux

$F_{plane, \% \geq 50\%}$ (median)	DT	3.31 DF[%]	493 lux
$F_{plane, \% \geq 95\%}$	DTM	1.66 DF[%]	248 lux

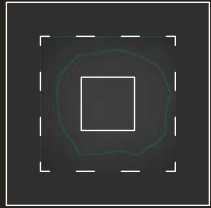
Open lining 25°
improvement is
34% on F_{plane}
median

1.5 /Daylight performance of rooflights / sizes

Explore how big area is daylighted by different rooflight sizes

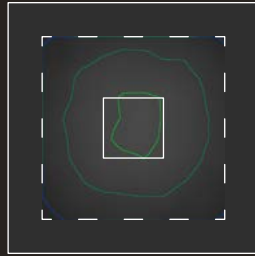
Group 1 – min. DT 1,6

(see table on page 10)



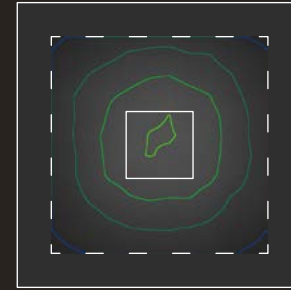
Rooflight 80/80 – room 3.00 x 3.00 m

$F_{\text{plane}} \geq 95\%$ | DT | 1.70 DF[%] | Pass (231 lux)



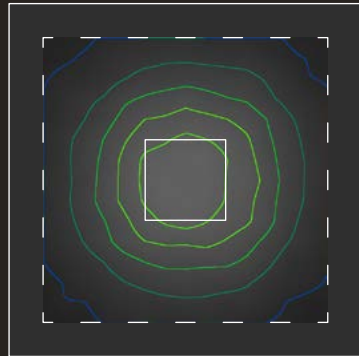
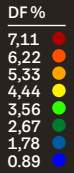
Rooflight 90/90 – room 3.70 x 3.70 m

$F_{\text{plane}} \geq 95\%$ | DT | 1.65 DF[%] | Pass (224 lux)



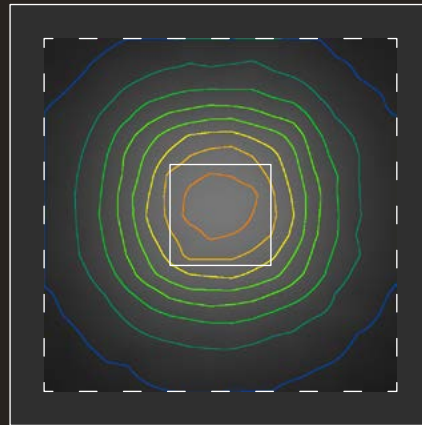
Rooflight 100/100 – room 4.20 x 4.20 m

$F_{\text{plane}} \geq 95\%$ | DT | 1.70 DF[%] | Pass (232 lux)



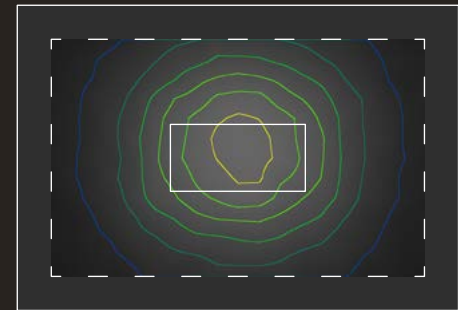
Rooflight 120/120 – room 5.20 x 5.20 m

$F_{\text{plane}} \geq 95\%$ | DT | 1.64 DF[%] | Pass (223 lux)



Rooflight 150/150 – room 6.20 x 6.20 m

$F_{\text{plane}} \geq 95\%$ | DT | 1.70 DF[%] | Pass (231 lux)



Rooflight 200/100 – room 6.50 x 4.50 m

$F_{\text{plane}} \geq 95\%$ | DT | 1.61 DF[%] | Pass (219 lux)

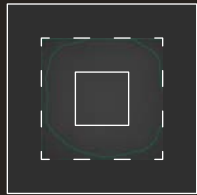
* Interiors with a nearly horizontal opening has to fulfill target daylight factor DT $\geq 95\%$ reference plane.

1.5 /Daylight performance of rooflights / sizes

Explore how big area is daylighted by different rooflight sizes

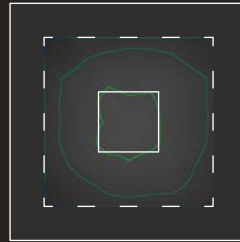
Group 2 – min. DT 1,8

(see table on page 10)



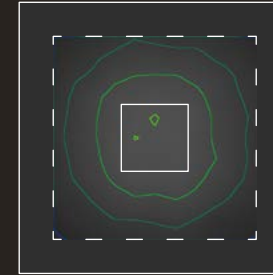
Rooflight 80/80 – room 2.80 x 2.80 m

$F_{plane} \geq 95\%$ | DT | 1.97 DF[%] | Pass (268 lux)



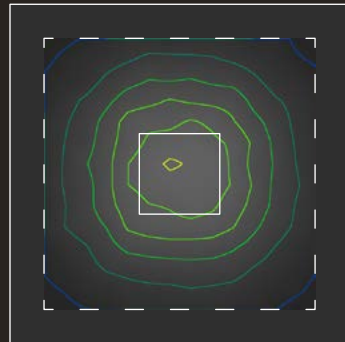
Rooflight 90/90 – room 3.50 x 3.50 m

$F_{plane} \geq 95\%$ | DT | 1.87 DF[%] | Pass (255 lux)



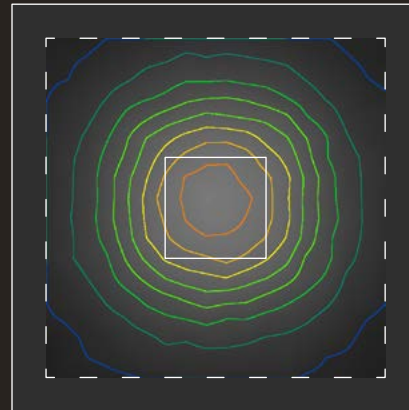
Rooflight 100/100 – room 4.00 x 4.00 m

$F_{plane} \geq 95\%$ | DT | 1.89 DF[%] | Pass (257 lux)



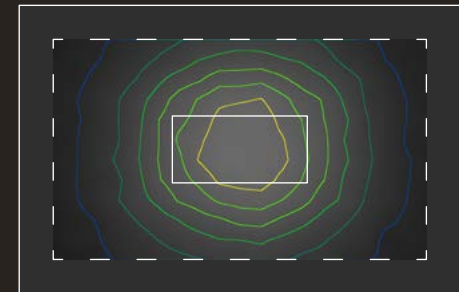
Rooflight 120/120 – room 5.00 x 5.00 m

$F_{plane} \geq 95\%$ | DT | 1.85 DF[%] | Pass (251 lux)



Rooflight 150/150 – room 6.00 x 6.00 m

$F_{plane} \geq 95\%$ | DT | 1.90 DF[%] | Pass (258 lux)



Rooflight 200/100 – room 6.50 x 4.25 m

$F_{plane} \geq 95\%$ | DT | 1.87 DF[%] | Pass (254 lux)

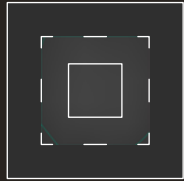
* Interiors with a nearly horizontal opening has to fulfill target daylight factor DT $\geq 95\%$ reference plane.

1.5 /Daylight performance of rooflights / sizes

Explore how big area is daylighted by different rooflight sizes

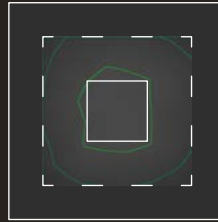
Group 3 – min. DT 2

(see table on page 10)



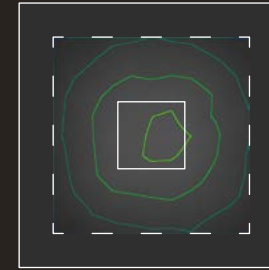
Rooflight 80/80 – room 2.60 x 2.60 m

$F_{\text{plane}} \geq 95\%$ | DT | 2.06 DF[%] | Pass (281 lux)



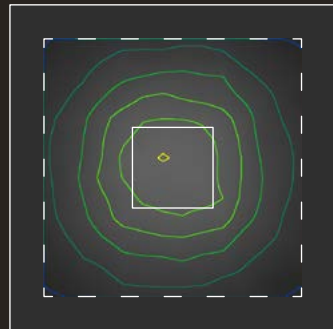
Rooflight 90/90 – room 3.20 x 3.20 m

$F_{\text{plane}} \geq 95\%$ | DT | 2.05 DF[%] | Pass (279 lux)



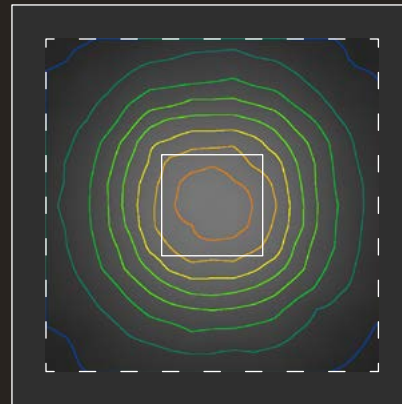
Rooflight 100/100 – room 3.90 x 3.90 m

$F_{\text{plane}} \geq 95\%$ | DT | 2.04 DF[%] | Pass (277 lux)



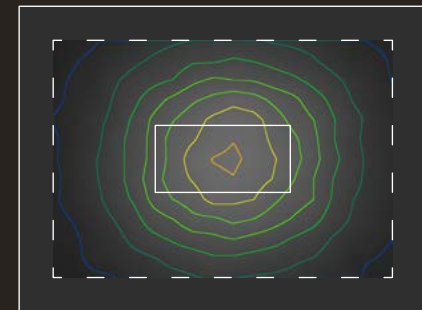
Rooflight 120/120 – room 4.80 x 4.80 m

$F_{\text{plane}} \geq 95\%$ | DT | 2.03 DF[%] | Pass (276 lux)



Rooflight 150/150 – room 5.90 x 5.90 m

$F_{\text{plane}} \geq 95\%$ | DT | 2.09 DF[%] | Pass (285 lux)



Rooflight 200/100 – room 6.00 x 4.50 m

$F_{\text{plane}} \geq 95\%$ | DT | 2.00 DF[%] | Pass (272 lux)

DF %
7,11
6,22
5,33
4,44
3,56
2,67
1,78
0,89

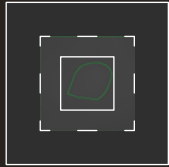
* Interiors with a nearly horizontal opening has to fulfill target daylight factor DT $\geq 95\%$ reference plane.

1.5 /Daylight performance of rooflights / sizes

Explore how big area is daylighted by different rooflight sizes

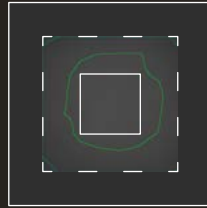
Group 4 – min. DT 2.2

(see table on page 10)



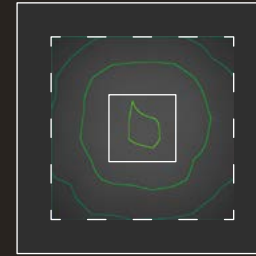
Rooflight 80/80 – room 2.40 x 2.40 m

$F_{plane} \geq 95\%$ | DT | 2.48 DF[%] | Pass (337 lux)



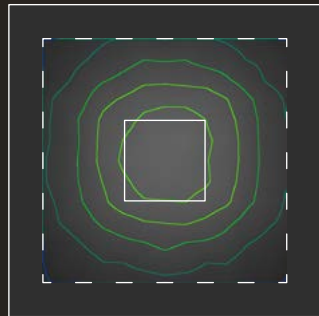
Rooflight 90/90 – room 3.00 x 3.00 m

$F_{plane} \geq 95\%$ | DT | 2.37 DF[%] | Pass (322 lux)



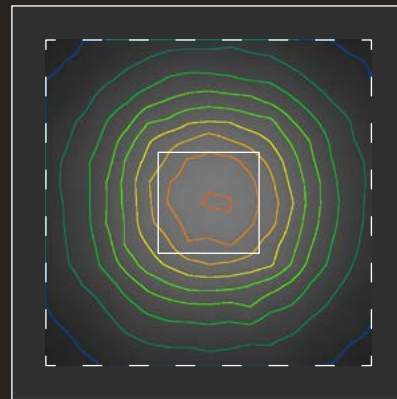
Rooflight 100/100 – room 3.70 x 3.70 m

$F_{plane} \geq 95\%$ | DT | 2.20 DF[%] | Pass (299 lux)



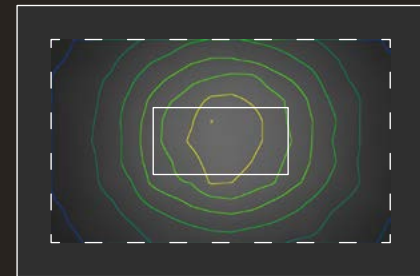
Rooflight 120/120 – room 4.60 x 4.60 m

$F_{plane} \geq 95\%$ | DT | 2.27 DF[%] | Pass (309 lux)



Rooflight 150/150 – room 5.80 x 5.80 m

$F_{plane} \geq 95\%$ | DT | 2.22 DF[%] | Pass (301 lux)



Rooflight 200/100 – room 6.00 x 4.00 m

$F_{plane} \geq 95\%$ | DT | 2.25 DF[%] | Pass (305 lux)

* Interiors with a nearly horizontal opening has to fulfill target daylight factor DT $\geq 95\%$ reference plane.

Rooflight organization

Explore the room
atmosphere changes

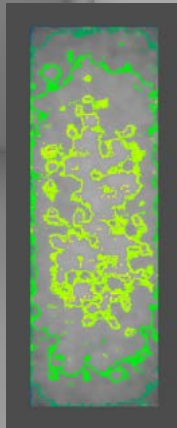


1.6 /Rooflight organization

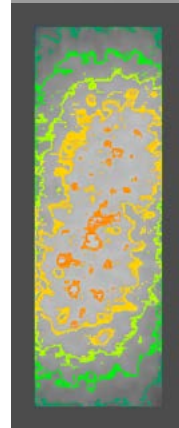
— Influence atmosphere and daylight distribution

Space size: 1,6×5 m
Size of the flat roof window 3× 80×80 cm

DF%
8,0 ●
7,0 ●
6,0 ●
5,0 ●
4,0 ●
3,0 ●
2,0 ●
1,0 ●



DF%
8,0 ●
7,0 ●
6,0 ●
5,0 ●
4,0 ●
3,0 ●
2,0 ●
1,0 ●



Space size: 1,6×5 m
Size of the flat roof window 2× 100×100 cm

1.6 /Rooflight organization

— Influence atmosphere and daylight distribution

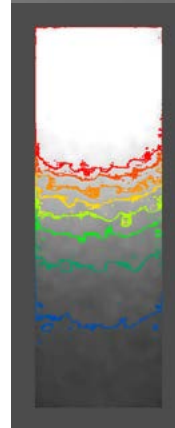
Space size: 1,6×5 m

Size of the flat roof window 2× 100×100 cm

DF%
8,0
7,0
6,0
5,0
4,0
3,0
2,0
1,0



DF%
8,0
7,0
6,0
5,0
4,0
3,0
2,0
1,0

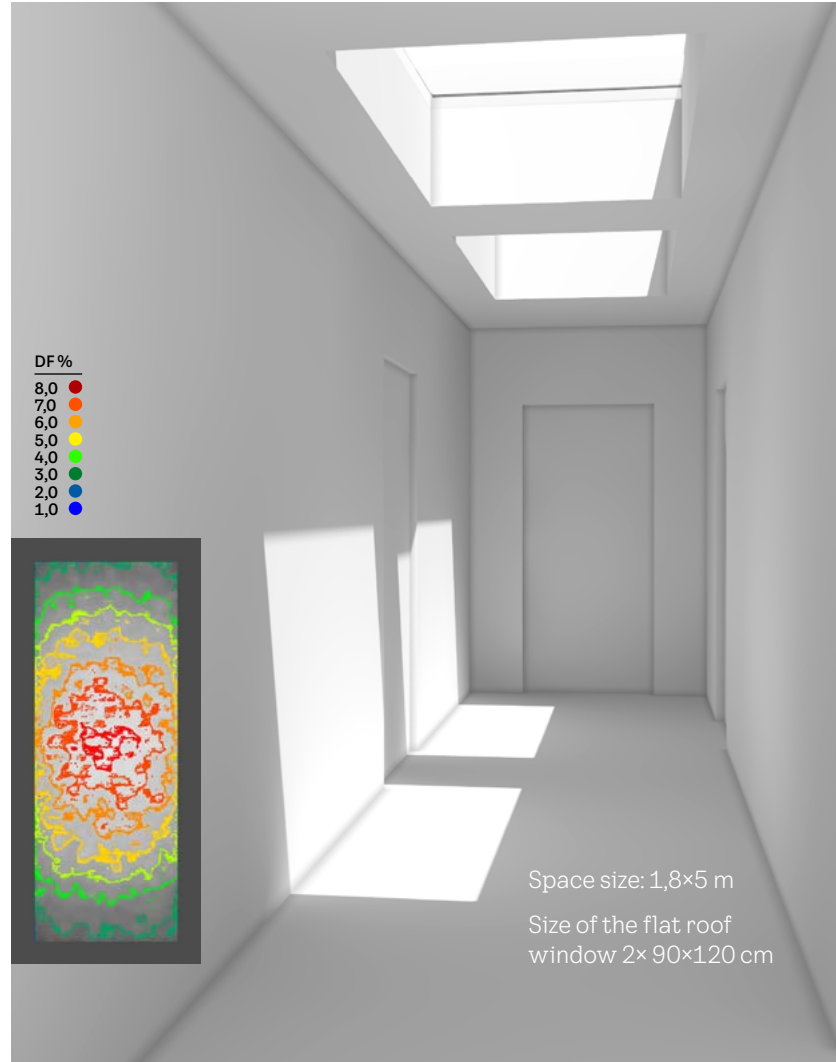
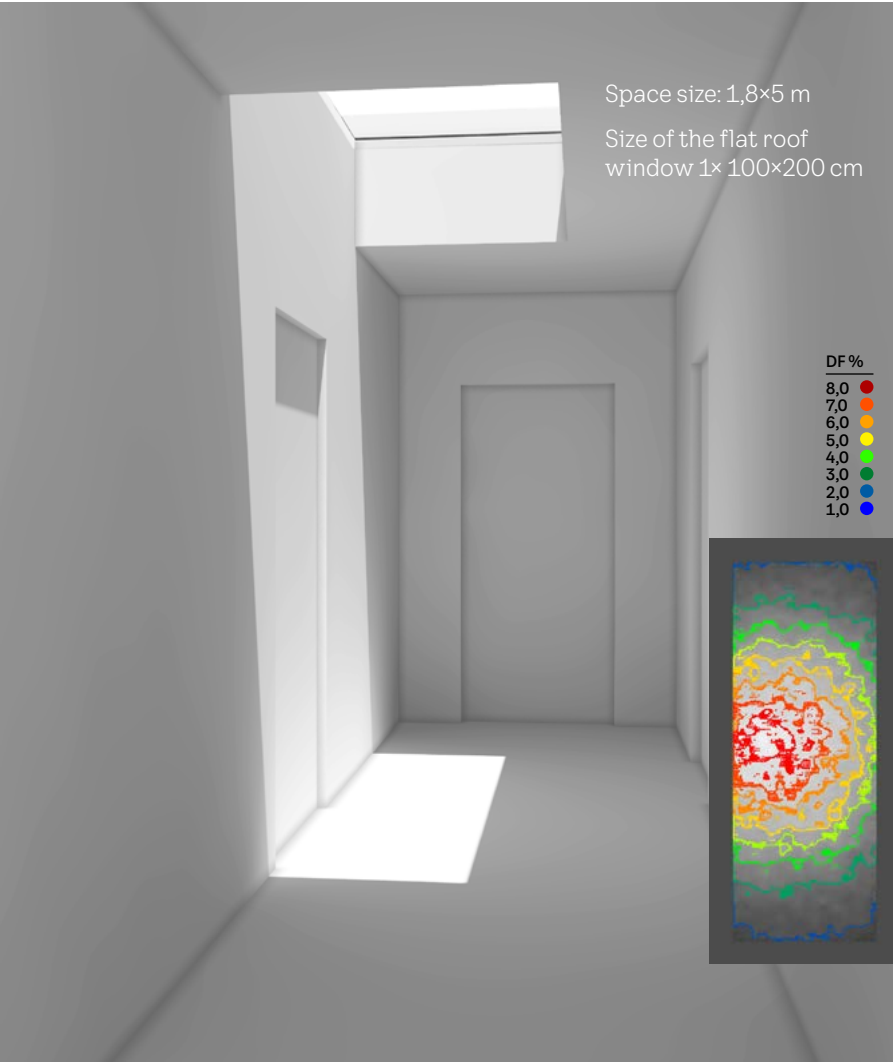


Space size: 1,6×5 m

Size of the flat roof window 1× 150×150 cm

1.6 /Rooflight organization

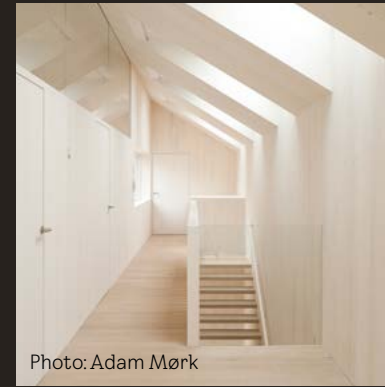
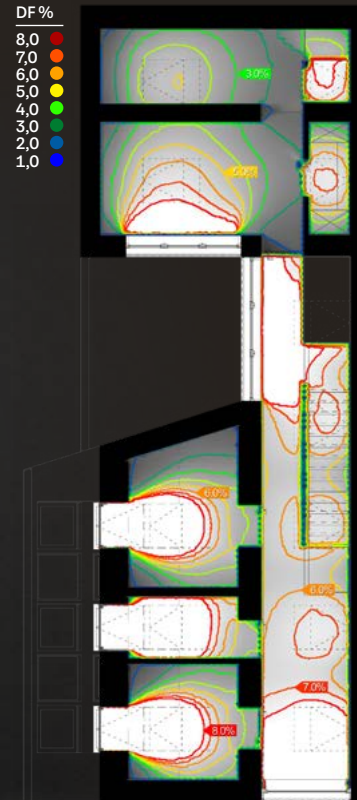
— Influence atmosphere and daylight distribution



1.7 /Daylight Visualizer

Professional natural lighting simulation tool

The VELUX Daylight Visualizer is a professional natural lighting simulation tool that helps analyze the daylight conditions of buildings. The program aims to help professionals visualize, predict, and document the level of natural light during the day before the building is built.



1.8 /Flat roof windows

Range



Curved glass rooflight

Top performer with CurveTech

Maximum daylight area

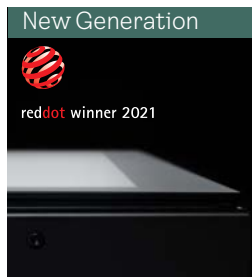
Excellent energy performance

State-of-the art design

Excellent sound reduction

Clear view and drainage with CurveTech

CFU / CVU | ISU 1093



Flat glass rooflight

Daylight, design and aesthetics

Maximum daylight area

Excellent energy performance

State-of-the art design

Excellent sound reduction

CFU / CVU | ISU 2093



Dome with glazing

Advanced dome solution

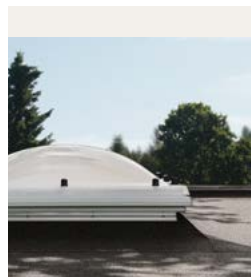
Good daylight area

Good energy performance

Classic design

Good sound reduction

CFP / CVP | ISD



Dome

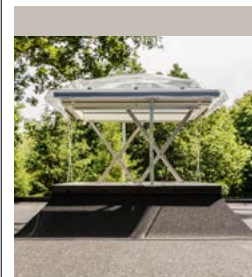
Without glazing. For uninhabited rooms and buildings

Basic daylight area

Basic energy performance

CFJ / CVJ | ISJ

Special function – flat roof solution

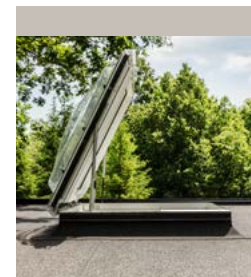


Smoke ventilation

Dome with glazing

Smoke ventilation with double glazed insulating glass unit, providing comfort for the users of the building.

CSP | ISD



Roof exit

Dome with glazing

Roof exit with double glazed insulating glass unit. Opens up to 60° for easy exit and excellent sound reduction.

CXP | ISD

Learn more about VELUX rooflight portfolio here:

1.8 /Flat roof windows

Dimension table

mm		height						
		600	800	900	1000	1200	1500	2000
width	600	CFU CVU CFP CVP 060060		CFU CVU CFJ CVJ 090060				CFU CVU Available from September 2023 200060
	800		CFU CVU CFP CVP 080080			CFU CVU Available from September 2023 150080		
	900	CFP CVP 060090		CFU CVU CFP CVP 090090		CFU CVU 120090	CFJ CVJ	
	1000			CFU CVU CFP CVP	CFJ CVJ CSP CXP		CFU CVU CFJ CVJ CFU CVU	CFJ CVJ
	1200		CFP CVP CXP 090120		CFU CVU CFP CVP	CFJ CVJ CSP CXP	CFU CVU Available from September 2023	
	1500			CFP CVP		CFU CVU CFP CVP	CFJ CVJ	
				100100		150100	200100	
				100150		150150		

Curved glass
rooflight
CFU/CVU



Flat glass rooflight
CFU/CVU



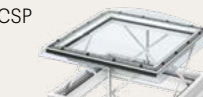
Dome with glazing
CFP/CVP



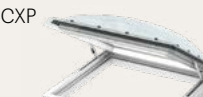
Dome
CFJ/CVJ



Smoke vent with
glazing CSP



Roof exit with
glazing CXP



CFP, CVP, CXP – the rectangular format must be installed the shorter side along the slope of the roof. On all vented rectangular sizes the window opens on the short side.

CFU, CVU, CFJ, CVJ – the rectangular format must be installed the longer side along the slope of the roof. On all vented rectangular sizes, the window opens on the long side.

02/ Rooms



Living room

The lighting
recommendation
is 500 LUX



Living room

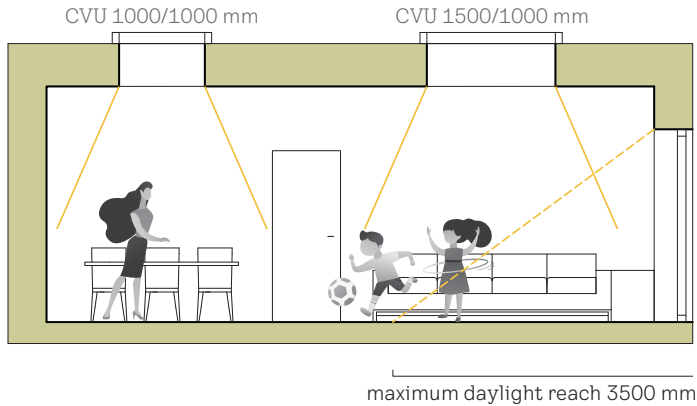
The lighting recommendation
is 500 LUX

Architect: Elkjær + Ebbeskov Arkitekter APS, Lotte Elkjær and Ane Ebbeskov
Photo: STAMERS KONTOR



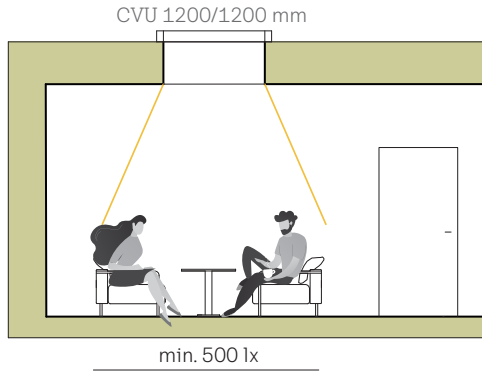
2.1 /Living room

Rooflights in central position for daylight autonomy



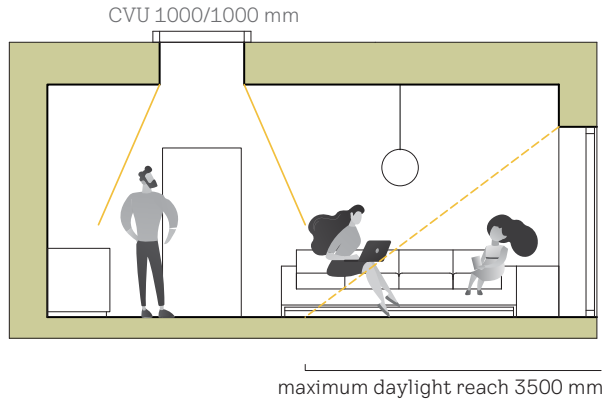
2.1 /Living room

Targeted daylight - living area



2.1 /Living room

Rooflights in depth of the room



Kitchen

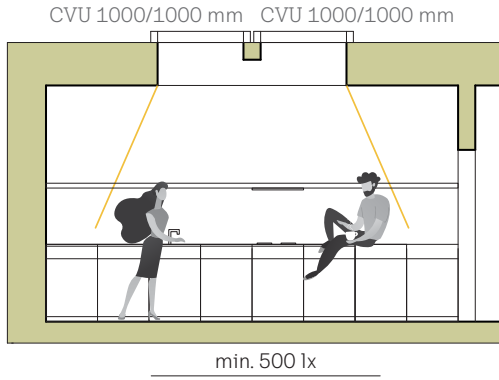
The lighting recommendation for food preparation is 500 LUX, for dining 300 LUX is recommended.

Architect: Elklær + Ebbeskov Arkitekter APS, Lotte Elklær and Ane Ebbeskov
Photo: STAMERS KONTO



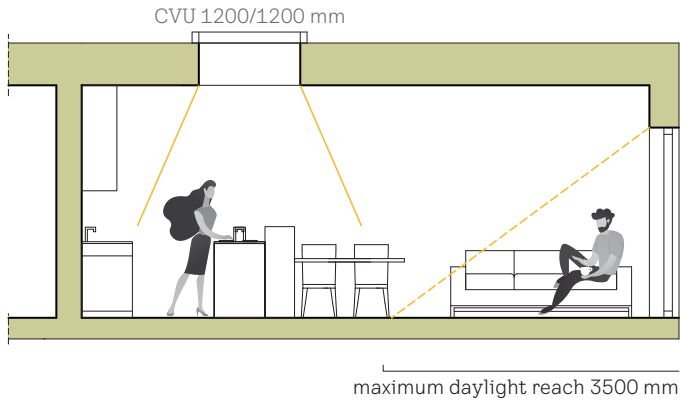
2.2 /Kitchen

Targeted daylight – above kitchen desk



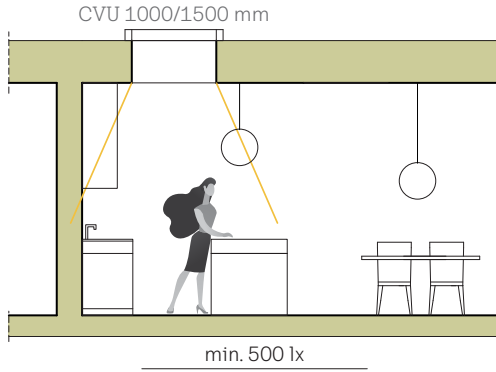
2.2 /Kitchen

— Targeted daylight – above kitchen island



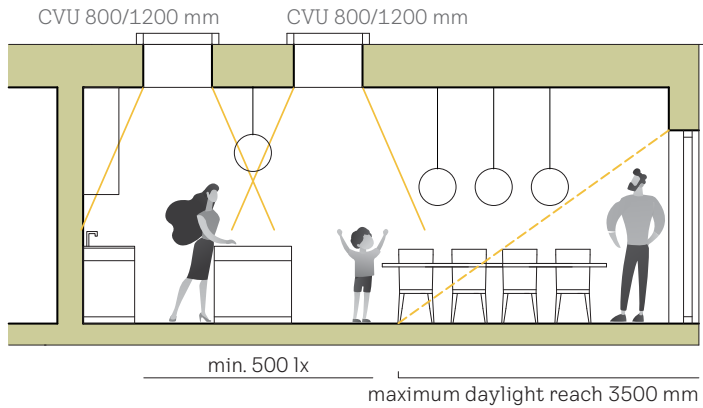
2.2 /Kitchen

Targeted daylight - between kitchen and kitchen island



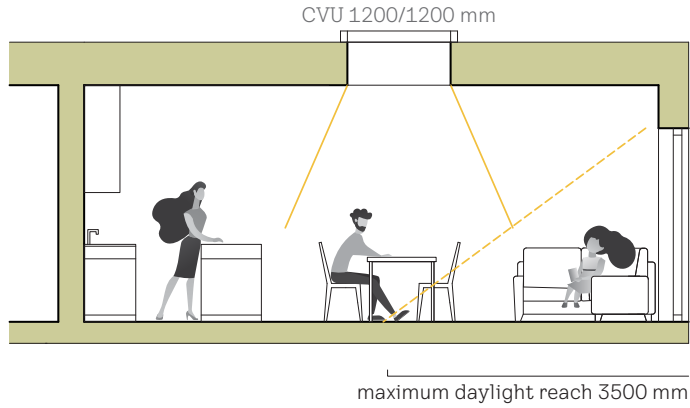
2.2 /Kitchen

Targeted daylight - between kitchen and dining table



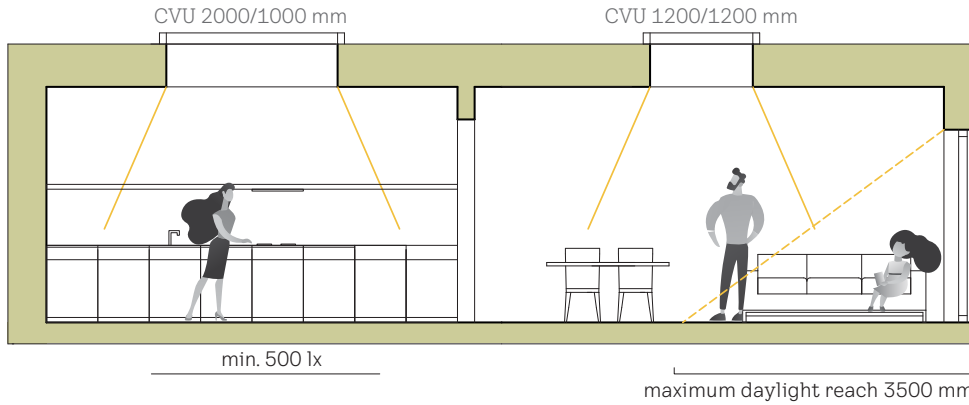
2.2 /Kitchen

— Targeted daylight – above dining table



2.2 /Kitchen

Rooflights in central position – daylight autonomy





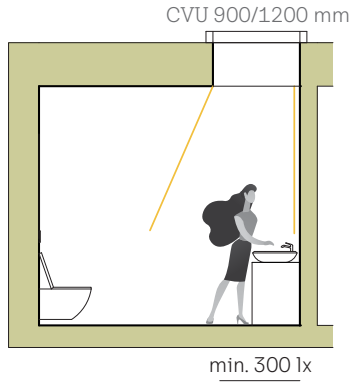
Bathroom

Recommended daylight level 300 lx

Photo: Magnum Haus Vollholzdesign

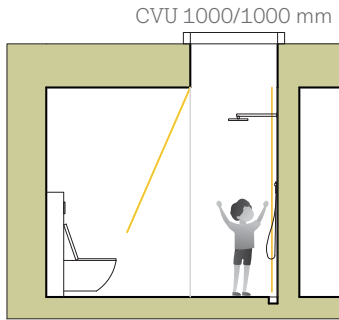
2.3 / Bathroom

— Targeted daylight – sink



2.3 / Bathroom

— Targeted daylight – shower

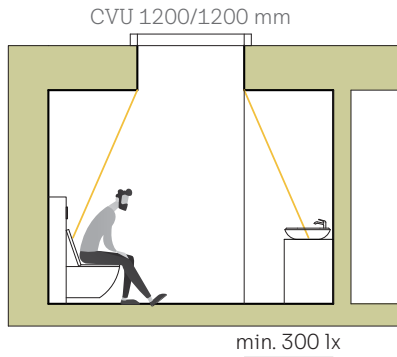


Photographer: Niklas Hart



2.3 / Bathroom

Rooflight in central position





Architect: KAMKABINET | Radim Horák, Hana Horáková
Photographer: Pavel Barták

Bathroom

Rooflight in central position





Architect: Juri Troy architects
Photographer: Lukas Schaller

Bathroom

Rooflight in central position



Bedroom

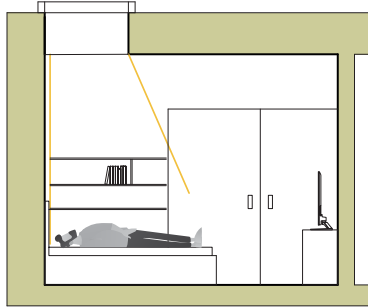
Daylight need 300 lx



2.4 /Bedroom

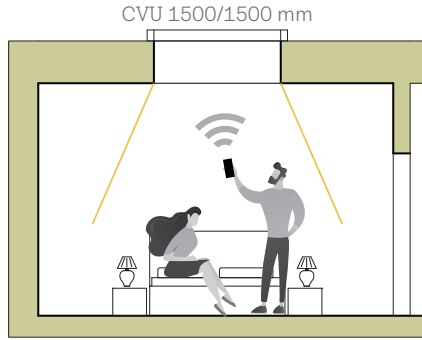
Daylight above the bed

CVU 900/1200 mm



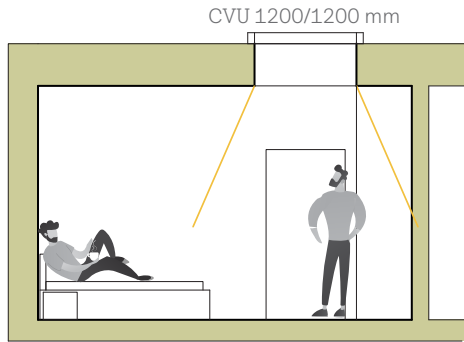
2.4 /Bedroom

Rooflights in central position



2.4 /Bedroom

Rooflights in depth of the room



3,5 m from the façade
additional source of
daylight is required

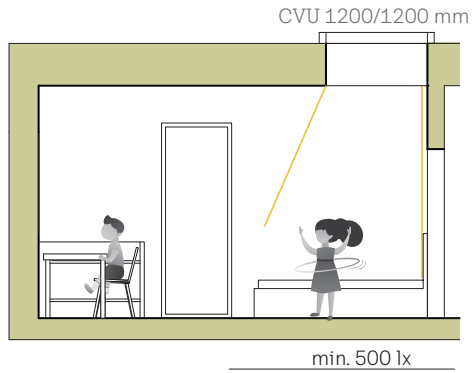


Kids room

Daylight need 500 lx



2.5 /Kids room



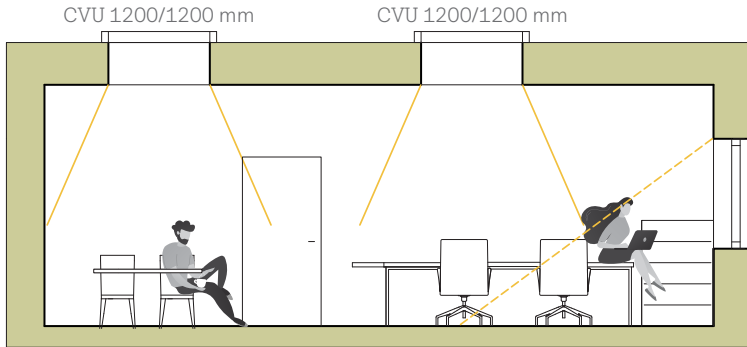


Home Office

Daylight need 500 lx

2.6 /Home Office

Targeted light



min. 500lx
maximum daylight reach 3500 mm

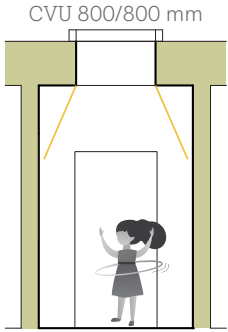




Corridor

Daylight need 100 lx

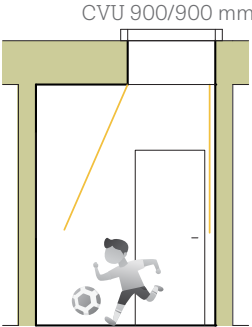
2.7 /Corridor



Photographer: Andrea Segliani



2.7 /Corridor



Staircase

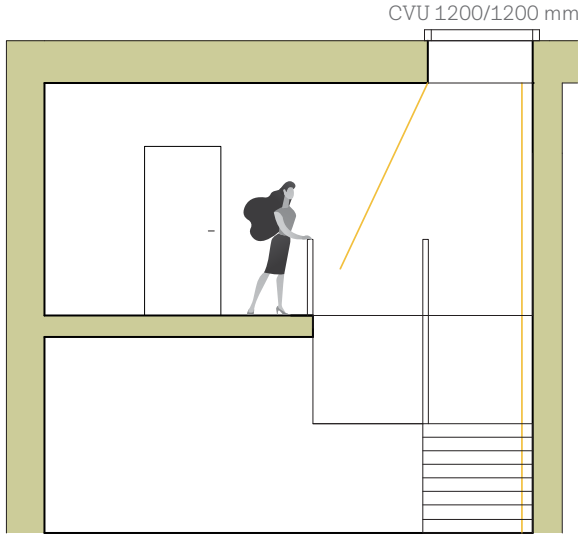
Daylight need 100 lx

Photographer: Niklas Hart



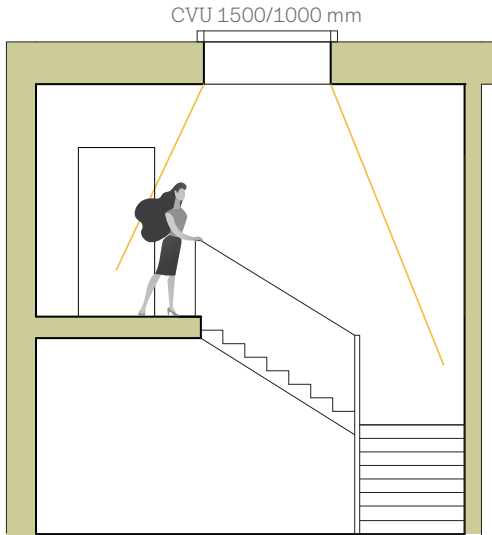
2.8 /Staircase

Functional light



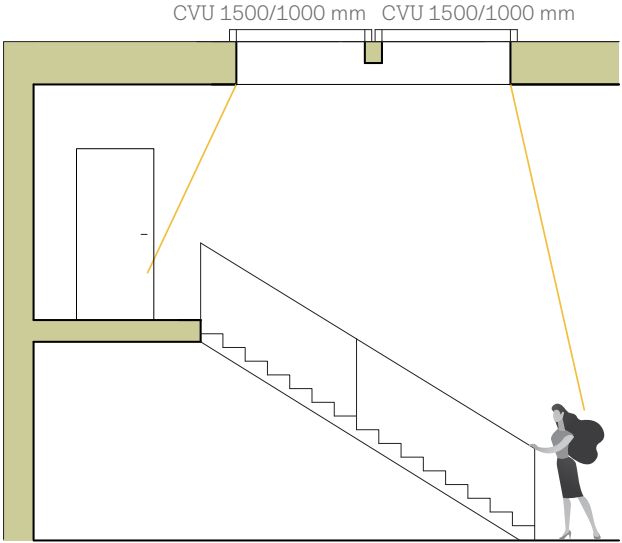
2.8 /Staircase


— Functional light – both floors day-lit



2.8 /Staircase

Effect light





Public and commercial

Design optimal light conditions

2.9 /Public and commercial

Rooflight organization

Deep spaces must be illuminated with multiple rooflights to have optimal daylight distribution



Villa in Küssnacht am Rigi, Switzerland

Architect: Alex Burger
Photographer: Sabrina Scheja

Using symmetrical or asymmetrical organization changes room atmosphere



School in Santander, Spain

Photographer: Torben Eskerod

2.9 /Public and commercial

Rooflight organization

Deep spaces must be illuminated with multiple rooflights to have optimal daylight distribution



School in Santander, Spain

Photographer: Torben Eskerod

Using symmetrical or asymmetrical organization changes room atmosphere



Kindergarten Neufeldt, Austria

Architect: SOLID architecture

Photographer: Kurt Kuball

2.9 /Public and commercial

— Rooflight line in inner position



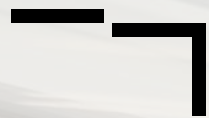
Design Werck, Denmark

Architect: SOLID architecture

Photographer: Torben Eskerod

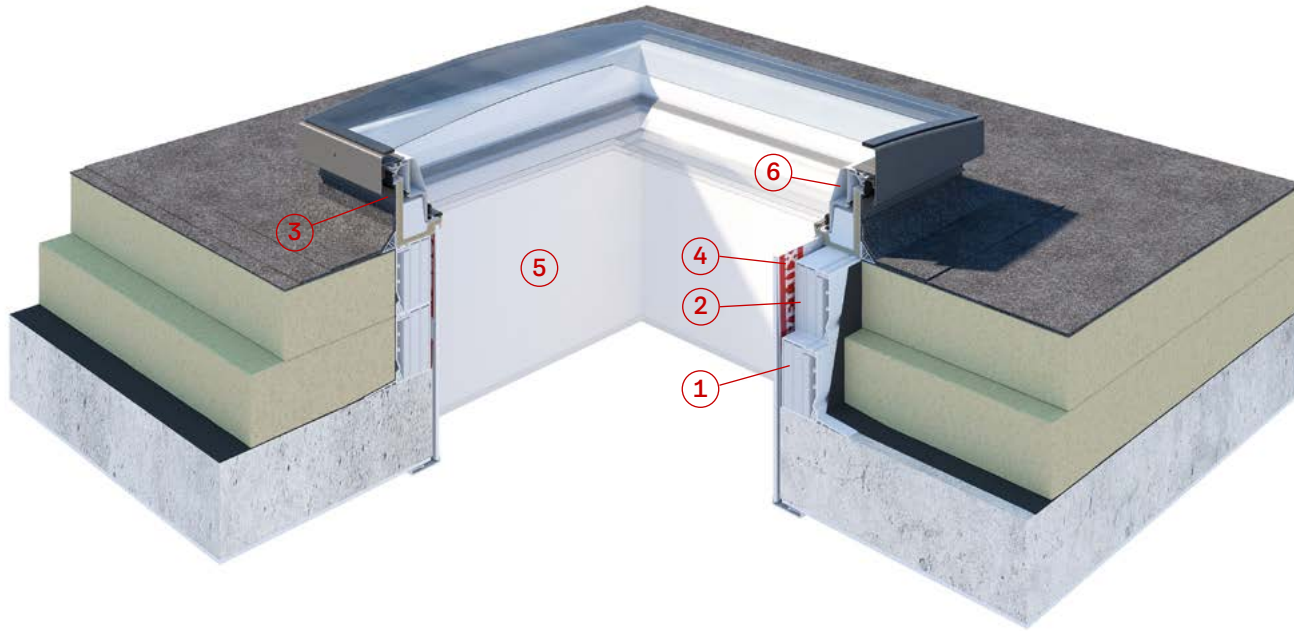


03/ Technical solutions



3.1 / VELUX system – flat roof windows

Installation accessories



6 Anti-heat blind (MSU)



Blackout blind (DSU)



1 Extension frame with flange (ZCU 0015)



height 160 mm

2 Extension frame (ZCU 1015)



max 3 pc.
height 160 mm

3 Securing kit (ZZZ 210U)



4 Vapour barrier collar (BBX)



5 Lining (LSF 2000)



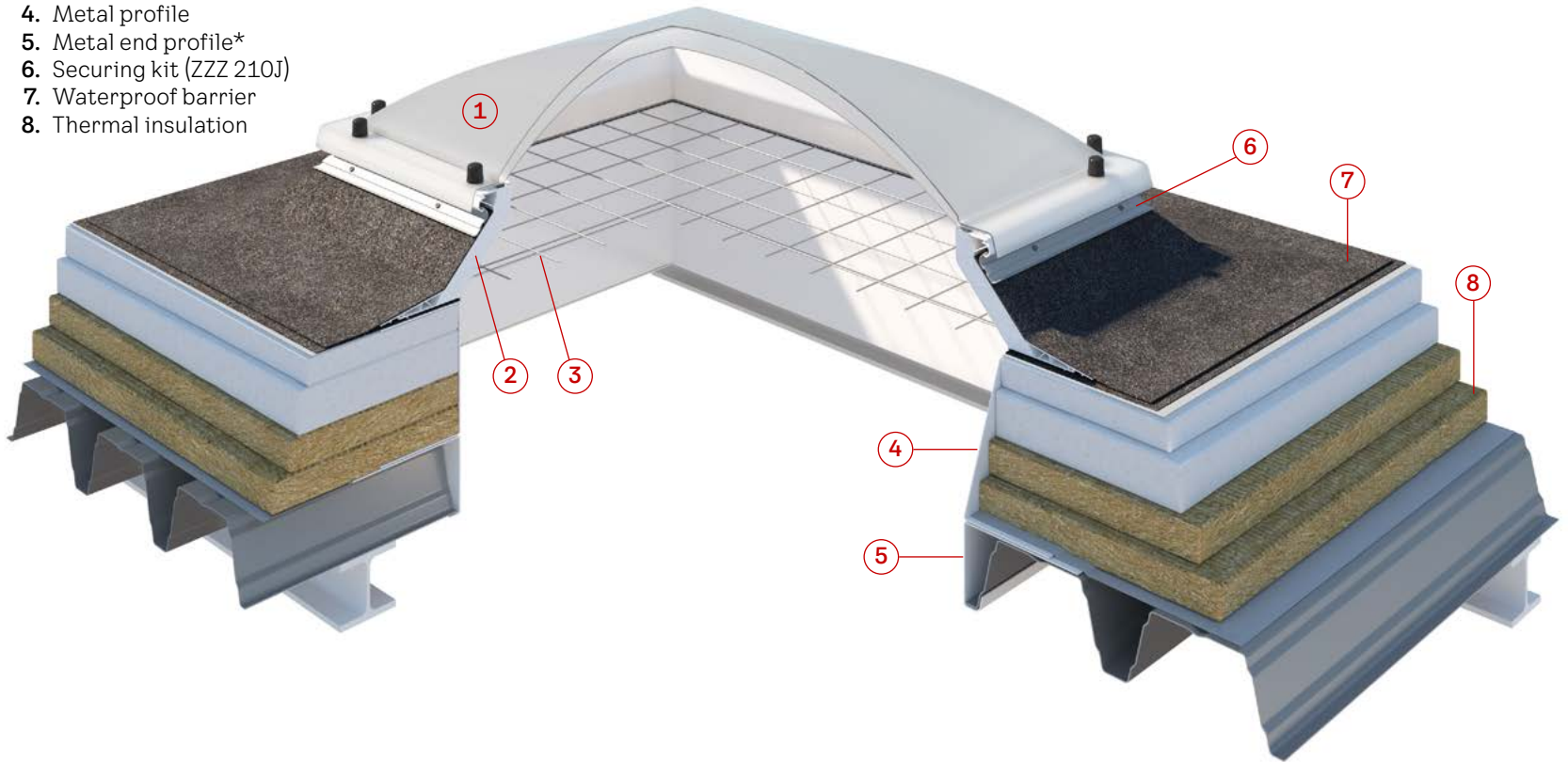
max. height 700 mm

Learn more about the products here:

3.2 /Roof structure overview

— Trapezoidal plate + Dome (CFJ+ISJ)

1. Dome skin (ISJ)
2. Fixed based unit (CFJ)
3. Fall through grid (ZZZ 257)
4. Metal profile
5. Metal end profile*
6. Securing kit (ZZZ 210J)
7. Waterproof barrier
8. Thermal insulation

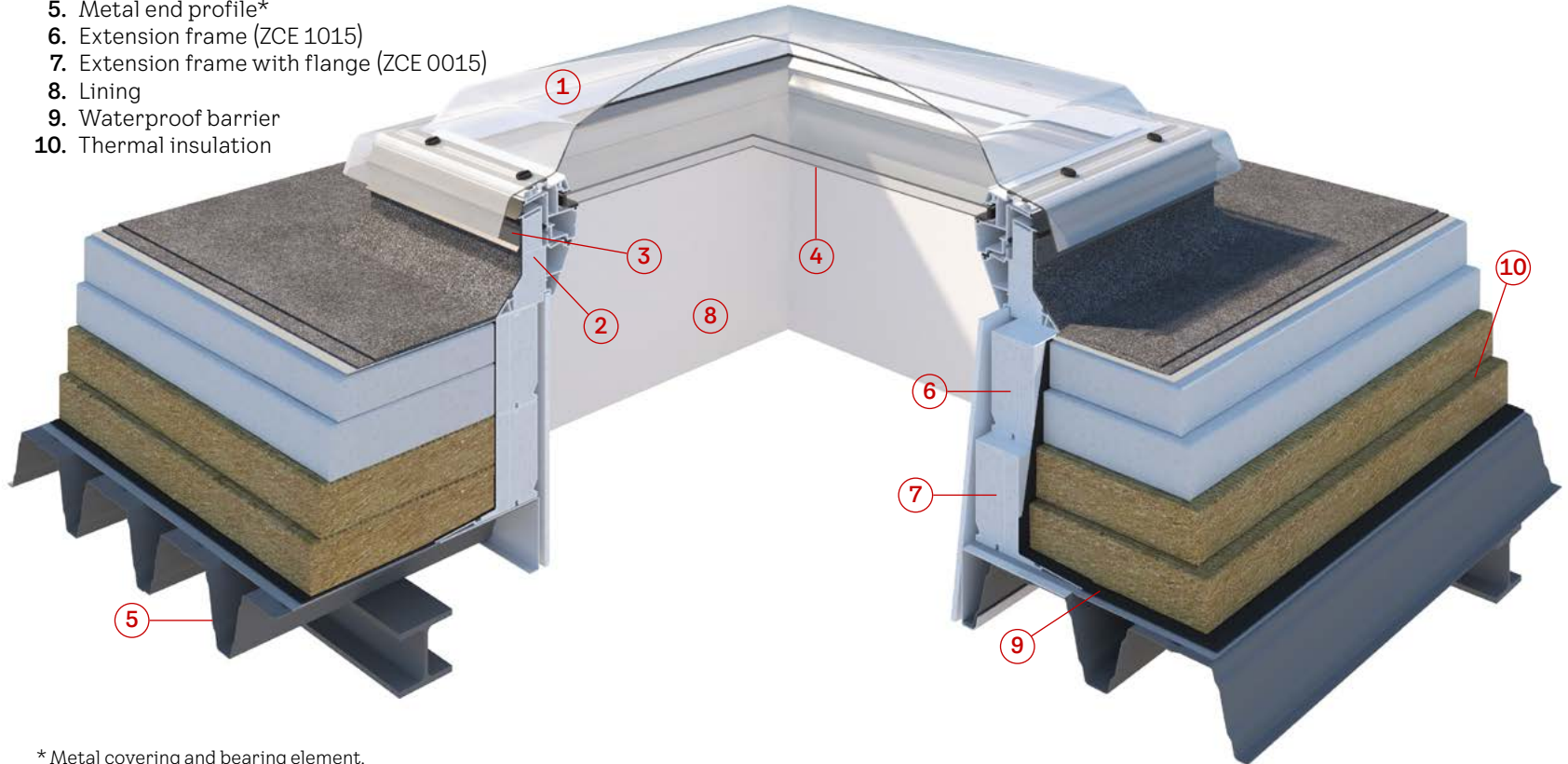


* Metal covering and bearing element.
Consult with structural engineer. (1,5-3 mm)

3.2 /Roof structure overview

— Trapezoidal plate + Dome with glazing (CFP/CVP + ISD)

1. Clear dome (ISD)
2. Base unit (CVP/CFP)
3. Securing kit (ZZZ 210)
4. Double glazing
5. Metal end profile*
6. Extension frame (ZCE 1015)
7. Extension frame with flange (ZCE 0015)
8. Lining
9. Waterproof barrier
10. Thermal insulation

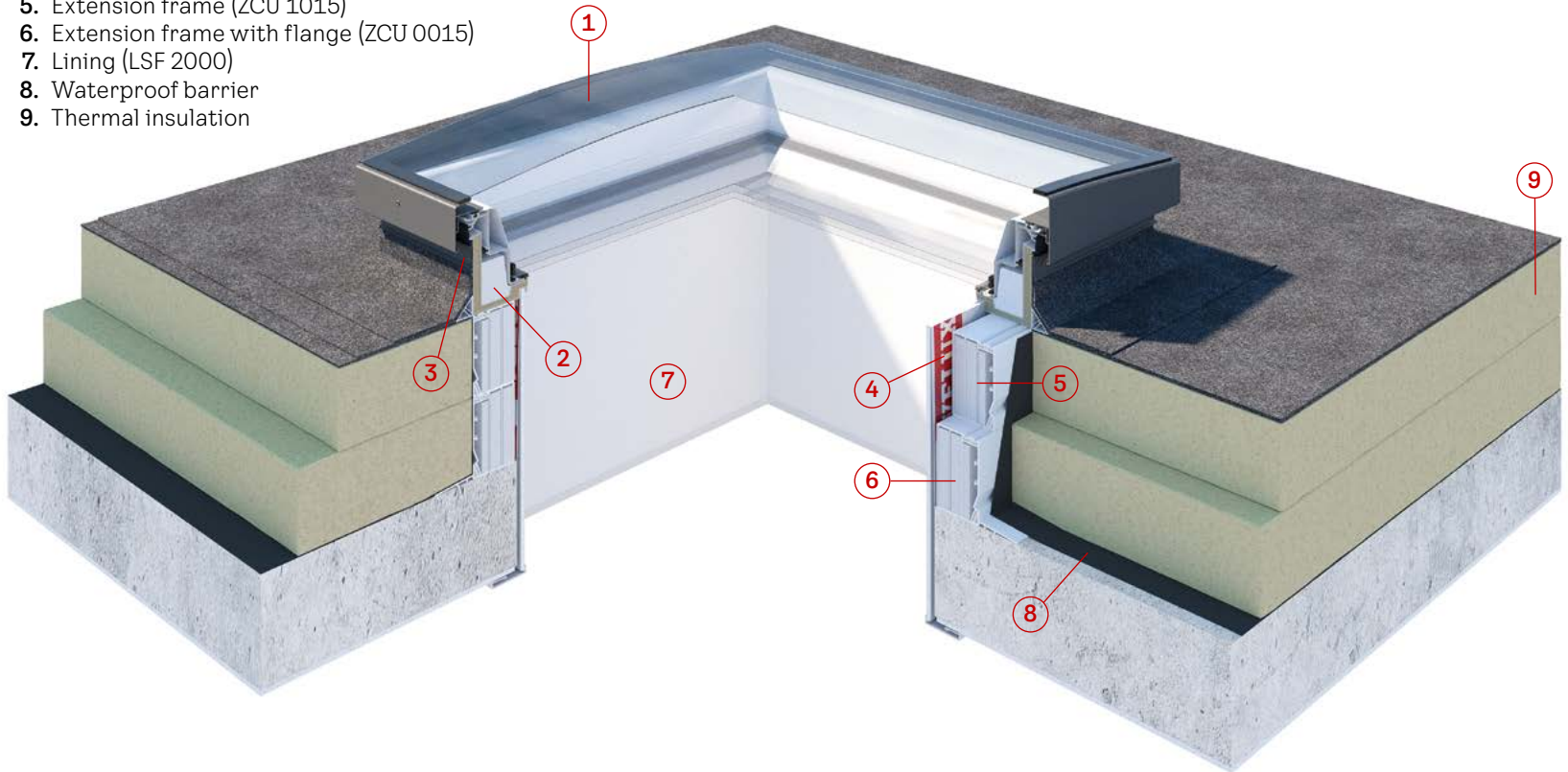


* Metal covering and bearing element.
Consult with structural engineer. (1,5-3 mm)

3.2 /Roof structure overview

Concrete structure + glass rooflight (CFU/CVU + ISU)

1. Curved glass top unit (ISU 1093)
2. Electrically vented base unit (CVU)
3. Securing kit (ZZZ 210U)
4. Vapour barrier collar (BBX)*
5. Extension frame (ZCU 1015)
6. Extension frame with flange (ZCU 0015)
7. Lining (LSF 2000)
8. Waterproof barrier
9. Thermal insulation

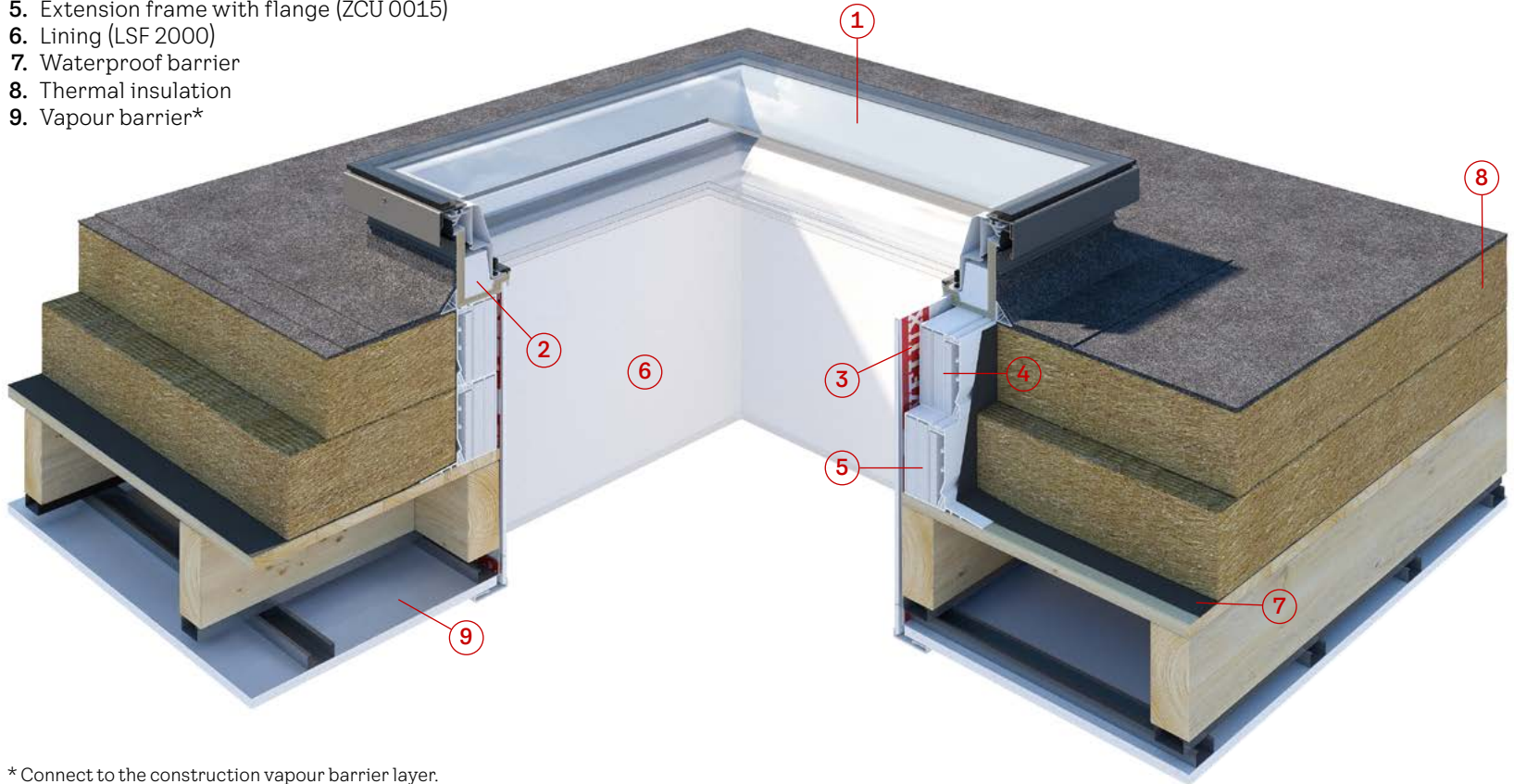


* Connect to the construction vapour barrier layer.

3.2 /Roof structure overview

Wooden structure + glass rooflight (CFU/CVU + ISU)

1. Flat glass top unit (ISU 2093)
2. Electrically vented base unit (CVU)
3. Vapour barrier collar (BBX)*
4. Extension frame (ZCU 1015)
5. Extension frame with flange (ZCU 0015)
6. Lining (LSF 2000)
7. Waterproof barrier
8. Thermal insulation
9. Vapour barrier*

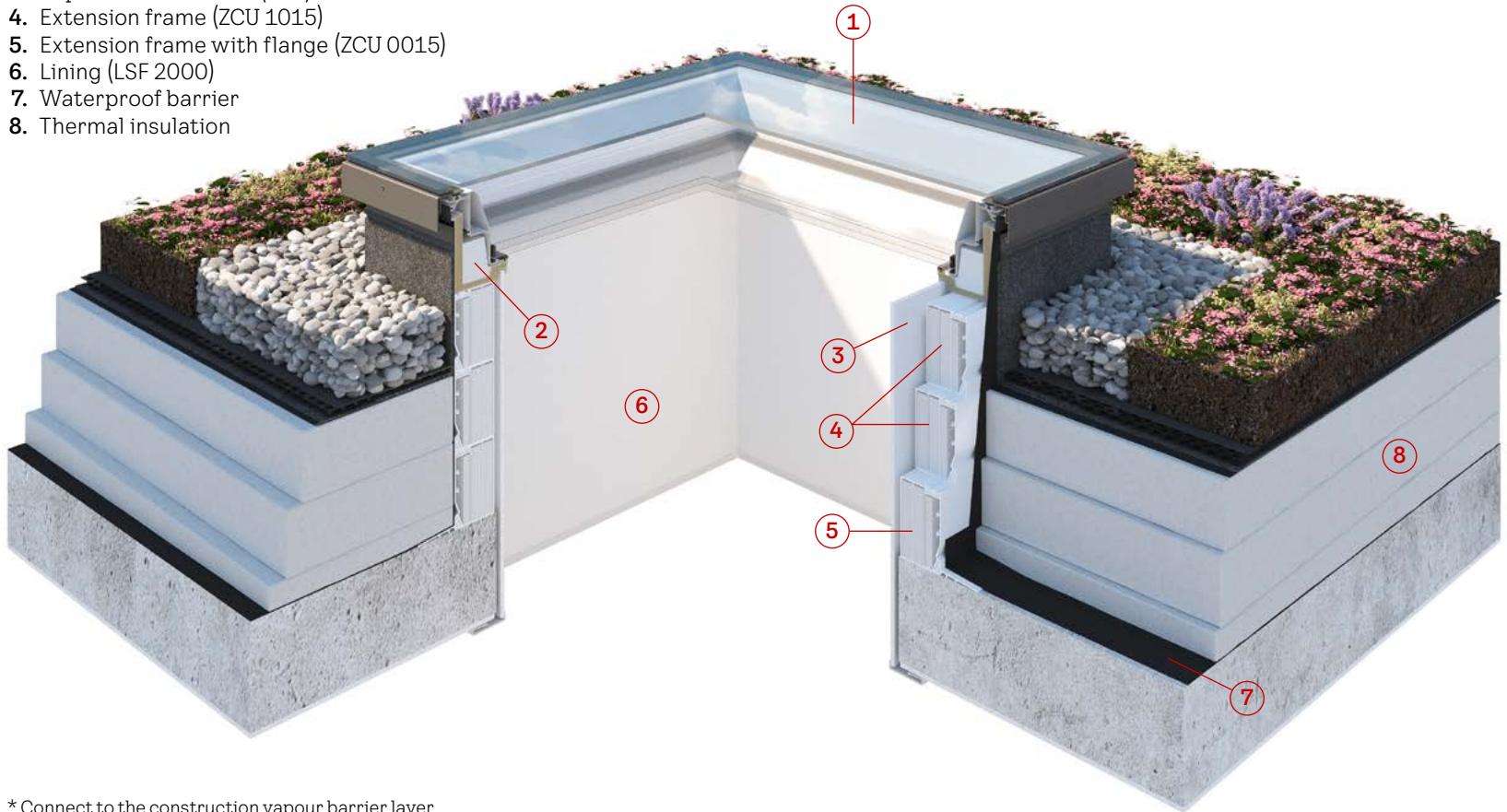


* Connect to the construction vapour barrier layer.

3.2 /Roof structure overview

Green roof, concrete structure + glass rooflight (CFU/CVU + ISU)

1. Flat glass top unit (ISU 2093)
2. Electrically vented base unit (CVU)
3. Vapour barrier collar (BBX)*
4. Extension frame (ZCU 1015)
5. Extension frame with flange (ZCU 0015)
6. Lining (LSF 2000)
7. Waterproof barrier
8. Thermal insulation

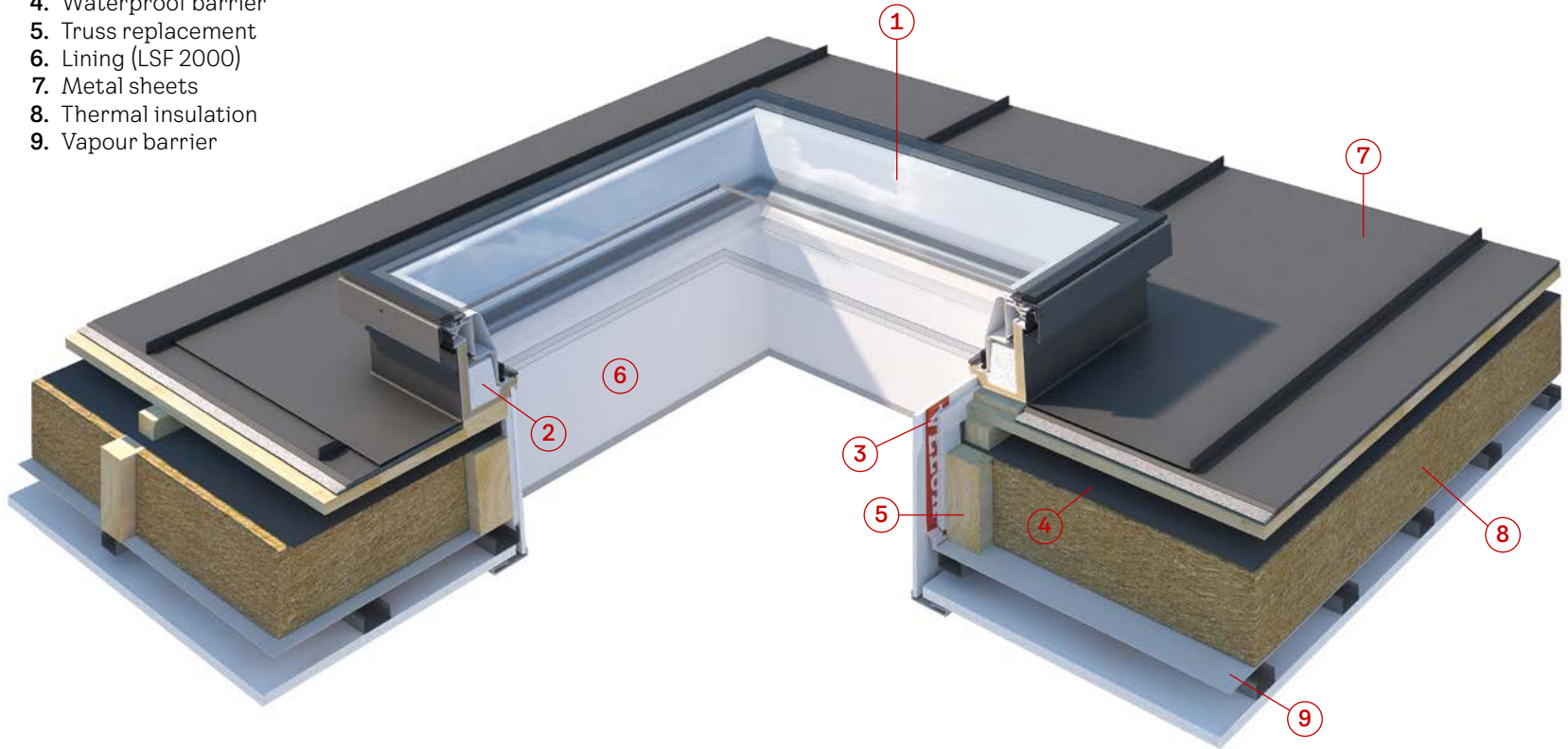


* Connect to the construction vapour barrier layer.

3.2 /Roof structure overview

Wooden structure, metal sheets + glass rooflight (CFU/CVU + ISU)

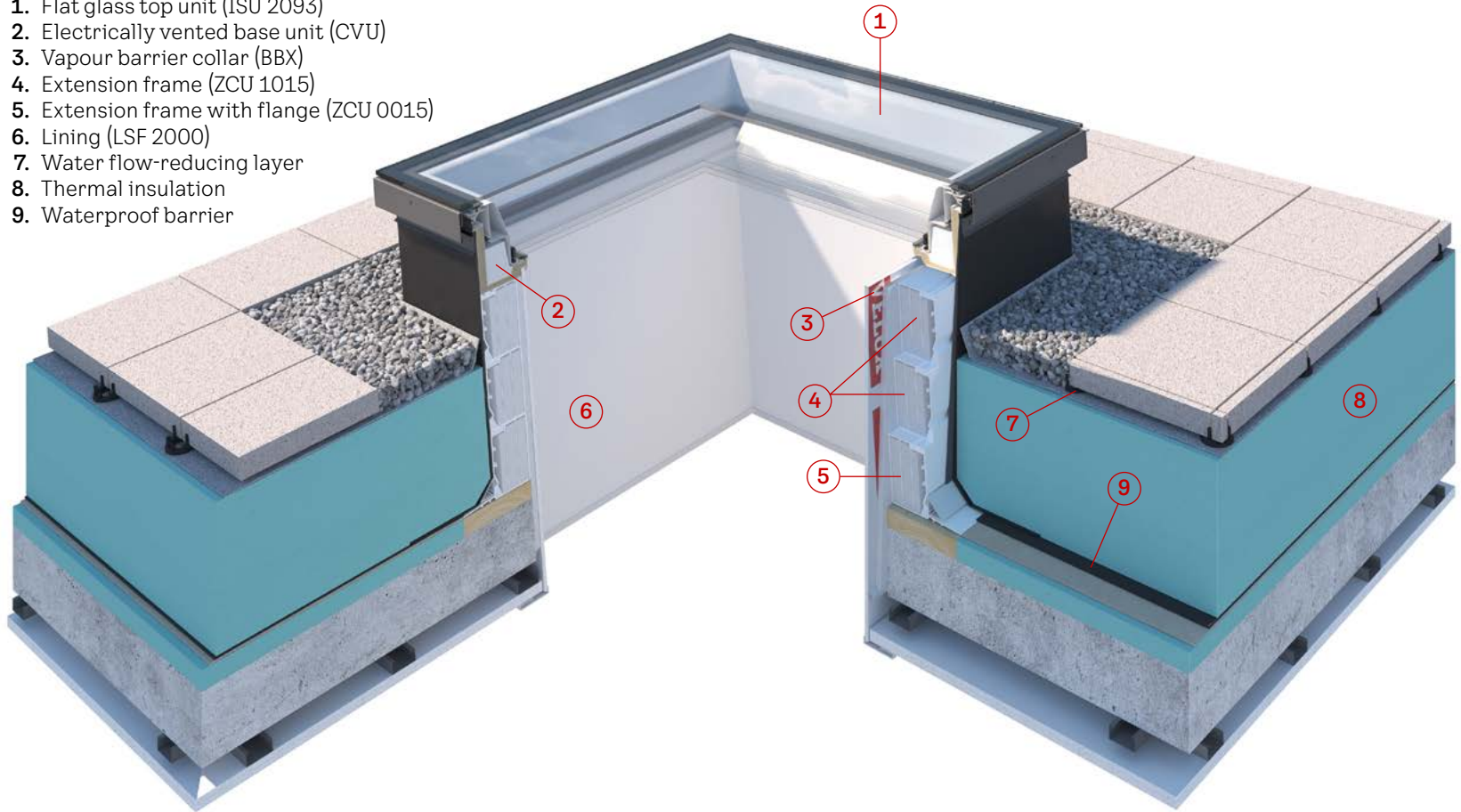
1. Flat glass top unit (ISU 2093)
2. Electrically vented base unit (CVU)
3. Vapour barrier collar (BBX)
4. Waterproof barrier
5. Truss replacement
6. Lining (LSF 2000)
7. Metal sheets
8. Thermal insulation
9. Vapour barrier



3.2 /Roof structure overview

Concrete structure + glass rooflight (CFU/CVU + ISU)

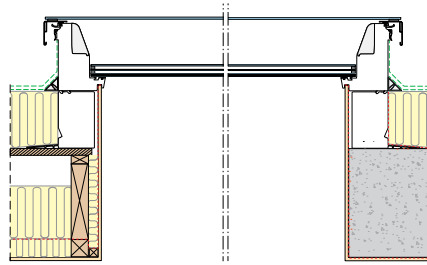
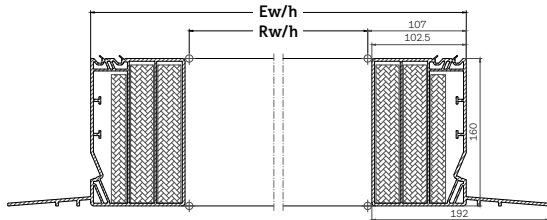
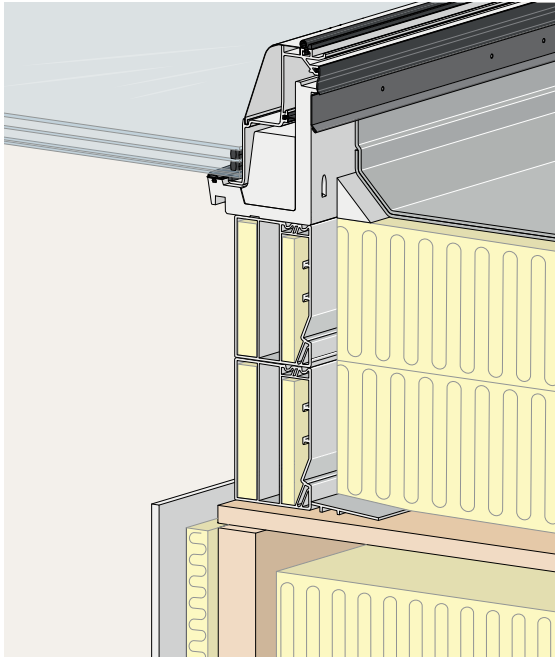
1. Flat glass top unit (ISU 2093)
2. Electrically vented base unit (CVU)
3. Vapour barrier collar (BBX)
4. Extension frame (ZCU 1015)
5. Extension frame with flange (ZCU 0015)
6. Lining (LSF 2000)
7. Water flow-reducing layer
8. Thermal insulation
9. Waterproof barrier



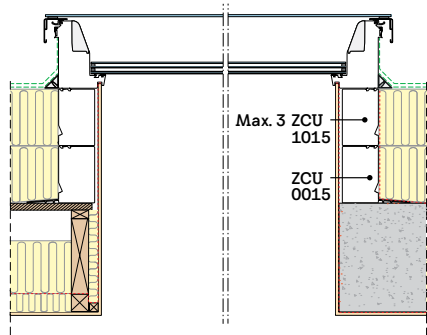
3.3 /Extension frames

VELUX system / on site made extension frames

VELUX system extension frames



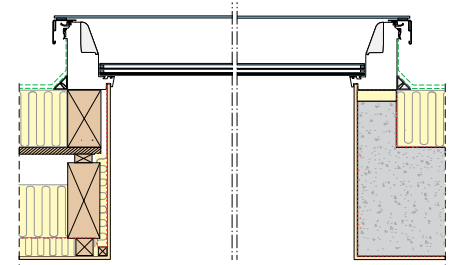
ZCU 0015



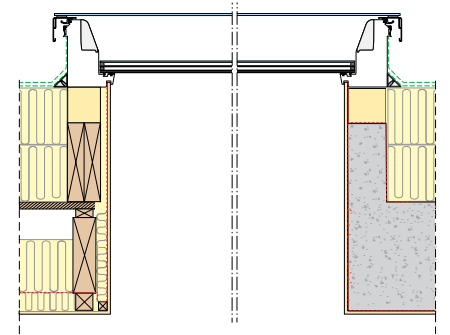
ZCU 0015+ ZCU 1015

VELUX insulated extension frame ZCU 1015 height: 160 mm
ZCU 0015 height: 160 mm

On site made extension frames



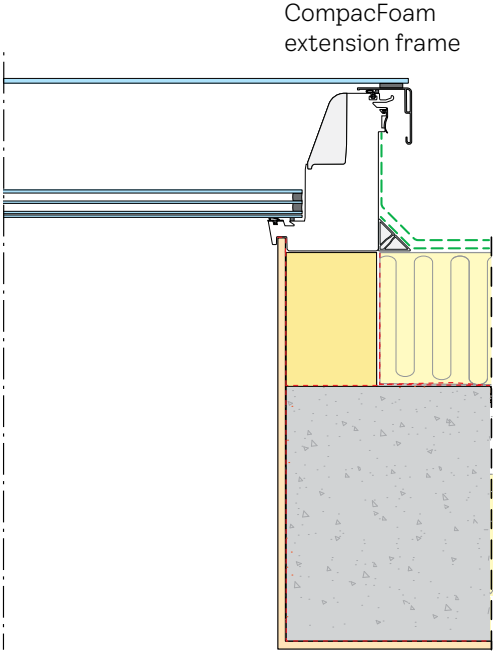
Wooden extension frame



Concrete extension frame

3.3 /Extension frames

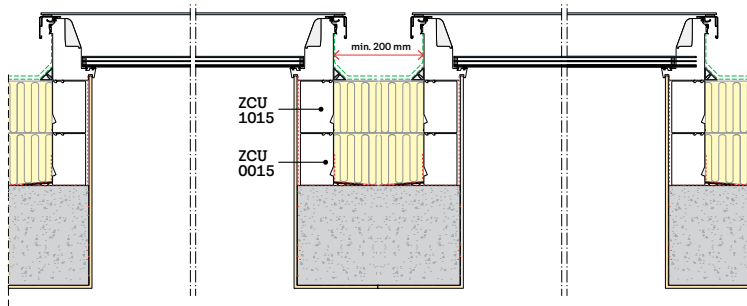
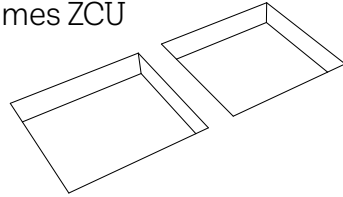
On site made extension frames



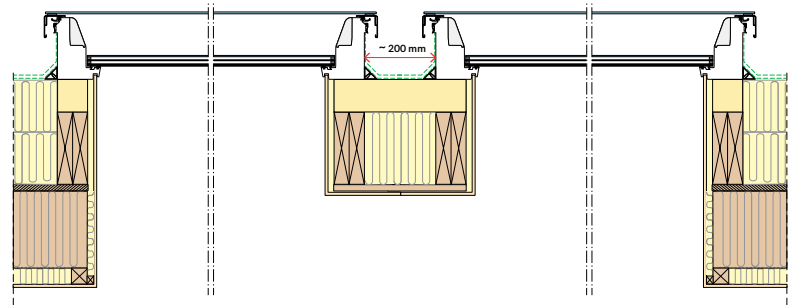
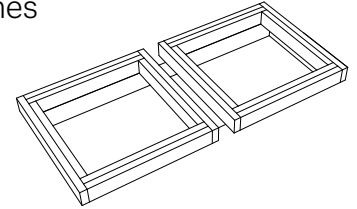
3.4 /Rooflights combination

— VELUX system / on site made extension frames

1. VELUX system extension frames ZCU



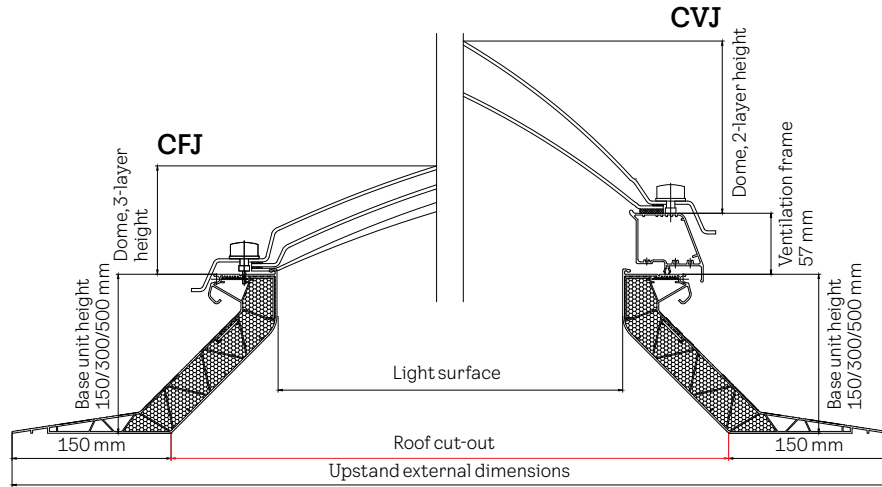
2. On site made extension frames



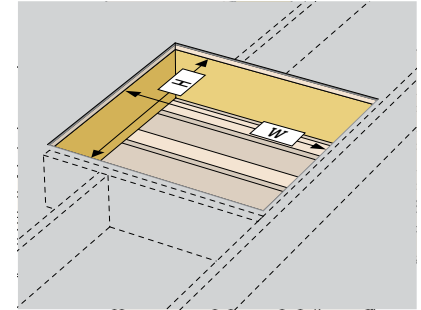
3.5 /Flat roof windows

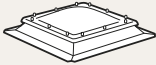
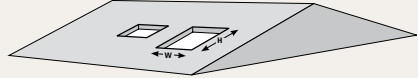
Dimension tables roof cut-out

Dome



roof cut-out



 Size code CFJ/CVJ	 Roof cut-out		Upstand external dimensions mm (W x H)	Light surface mm (W x H)	Dome, 2/3-layer height mm
	W mm	H mm			
060060	600	600	900×900	400×400	137
080080	800	800	1100×1100	600×600	177
090060	900	600	1200×900	700×400	177
090090	900	900	1200×1200	700×700	197
100100	1000	1000	1300×1300	800×800	217
120090	1200	900	1500×1200	1000×700	197
120120	1200	1200	1500×1500	1000×1000	268
150100	1500	1000	1800×1300	1300×800	217
150150	1500	1500	1800×1800	1300×1300	328
200100	2000	1000	2300×1300	1800×800	217

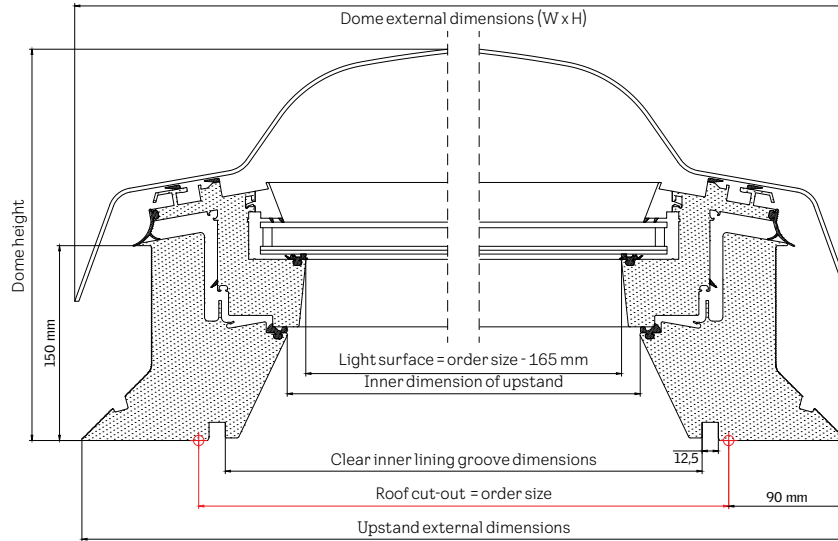


Available also in size 200x100 with 15 cm upstand only.

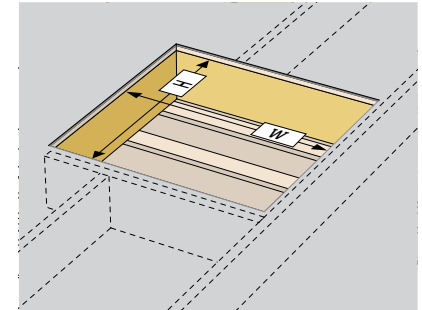
3.5 /Flat roof windows

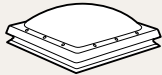
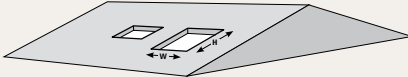
Dimension tables roof cut-out

Dome with glazing



roof cut-out



 Size code CFP/CVP	 Roof cut-out		Upstand External dimensions mm (W x H)	Light Inner lining Groove size mm (W x H)	Light surface mm (W x H)
	W mm	H mm			
060060	600-610	600-610	780×780	559×559	435×435
080080	800-810	800-810	980×980	759×759	635×635
060090	600-610	900-910	780×1080	559×859	435×735
090090	900-910	900-910	1080×1080	859×859	735×735
090120	900-910	1200-1210	1080×1380	859×1159	735×1035
100100	1000-1010	1000-1010	1180×1180	959×959	835×835
100150	1000-1010	1500-1510	1180×1680	959×1459	835×1335
120120	1200-1210	1200-1210	1380×1380	1159×1159	1035×1035
150150	1500-1510	1500-1510	1680×1680	1459×1459	1335×1335


 0-15°

3.5 /Flat roof windows

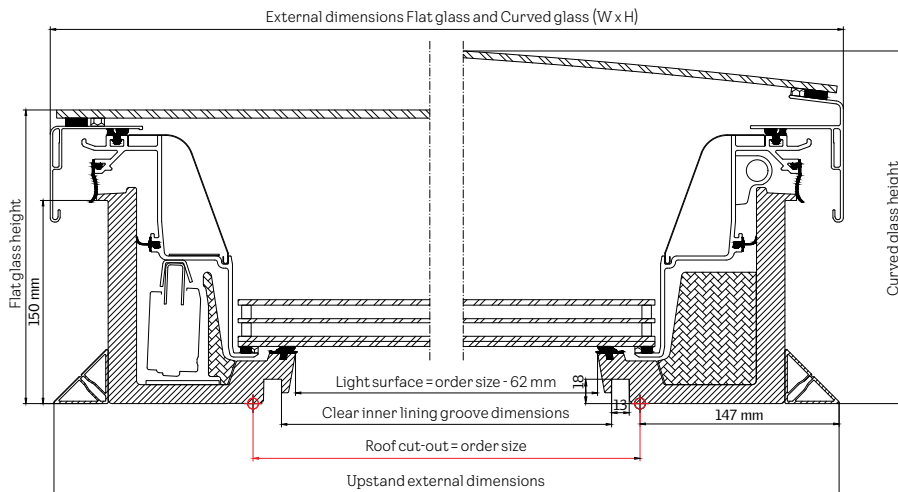
Dimension tables roof cut-out

New Generation

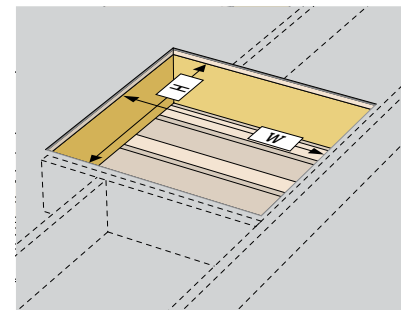
Flat glass
rooflight



Curved glass
rooflight



roof cut-out



Size code CFU/CVU	Roof cut-out		Upstand external dimensions mm (W x H)	Light surface mm (W x H)	Inner lining Groove size mm (W x H)
	W mm	H mm			
060060	600-610	600-610	893×893	538×538	559×559
080080	800-810	800-810	1093×1093	738×738	759×759
090060	900-910	600-610	1193×893	835×538	859×559
090090	900-910	900-910	1193×1193	835×835	859×859
100100	1000-1010	1000-1010	1293×1293	938×938	959×959
120090	1200-1210	900-910	1493×1193	1138×835	1159×859
120120	1200-1210	1200-1210	1493×1493	1138×1138	1159×1159
150080*	1500-1510	800-810	1793×1093	1438×738	1459×759
150100	1500-1510	1000-1010	1793×1293	1438×938	1459×959
150120*	1500-1510	1200-1210	1793×1493	1438×1138	1459×1159
150150	1500-1510	1500-1510	1793×1793	1438×1438	1459×1459
200060*	2000-2010	600-610	2293×893	1938×538	1959×559
200100	2000-2010	1000-1010	2293×1293	1938×938	1959×959



2-15°


Flat glass
ISU 2093



0-15°

Curved glass
ISU 1093

* Available from September 2023



Lining

Design of lining make
final room design

Photographer: Adam Mørk

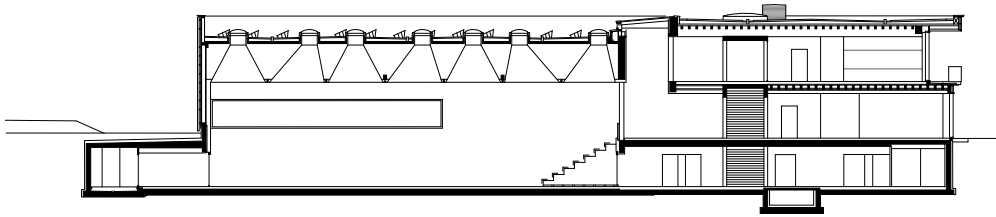
3.6 /Lining and lining shapes

Suspended ceiling solutions

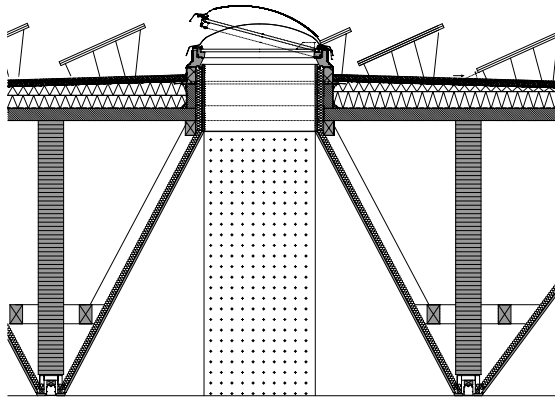
Multi-Purpose Hall in Klaus, Austria

Architect: Dietrich | Untertifaller Architekten, Austria

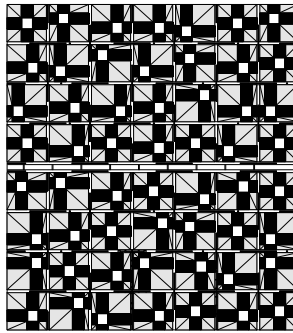
Photographer: Patricia Weisskirchner



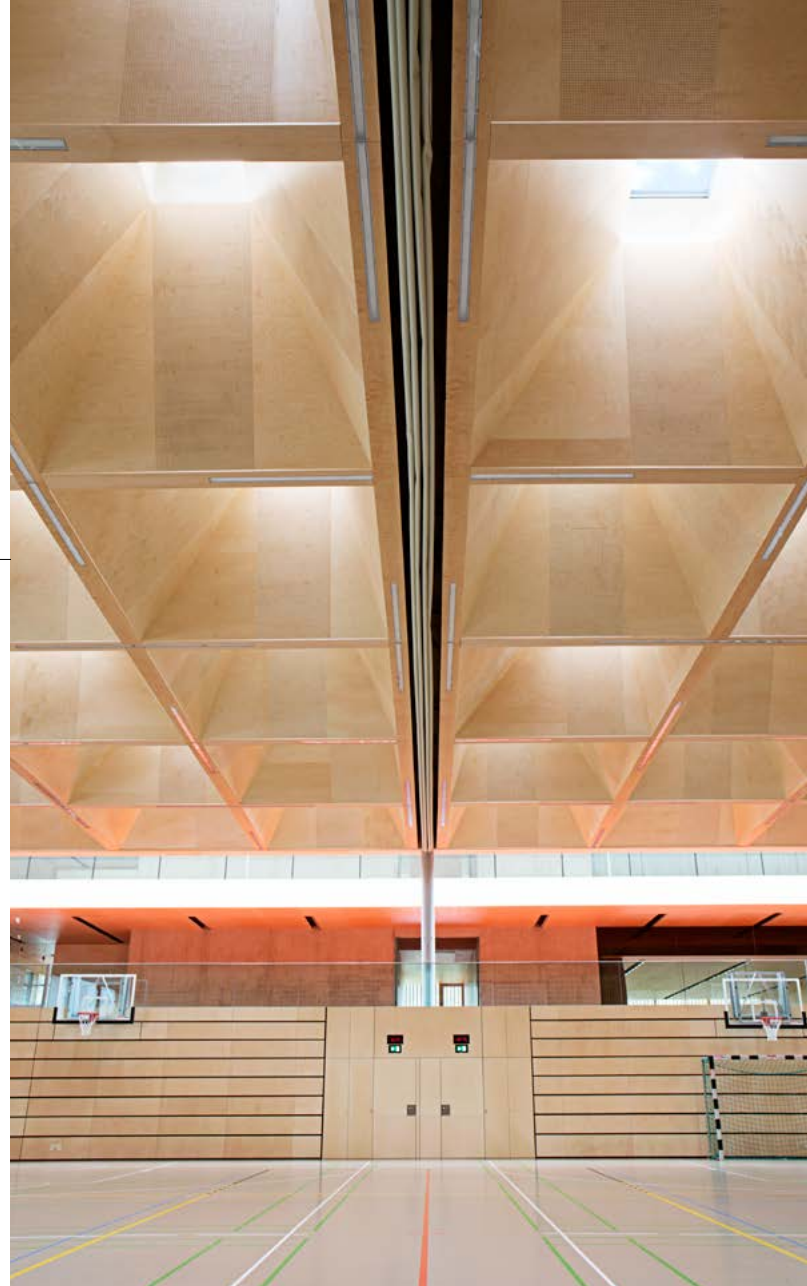
Prefabricated open light shafts



Detail of a light shaft



Overview plan of the ceiling



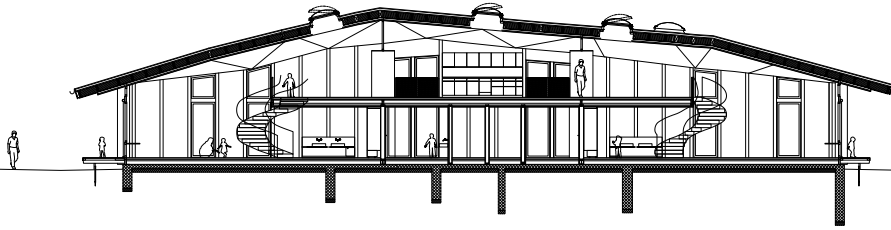
3.6 /Lining and lining shapes

Suspended ceiling solutions

A Kindergarten in Rotkreuz, Switzerland

Architect: Melk Nigg Architects, Switzerland

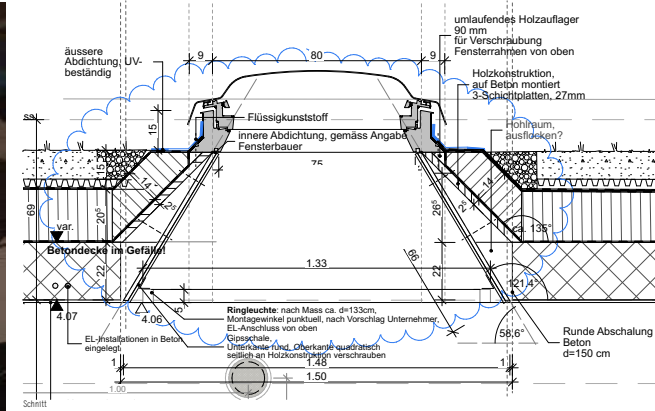
Photographer: Melk Nigg, Kasia Jackowska



A Kindergarten in Rotkreuz, Switzerland

Architect: Melk Nigg Architects, Switzerland

Photographer: Melk Nigg, Kasia Jackowska

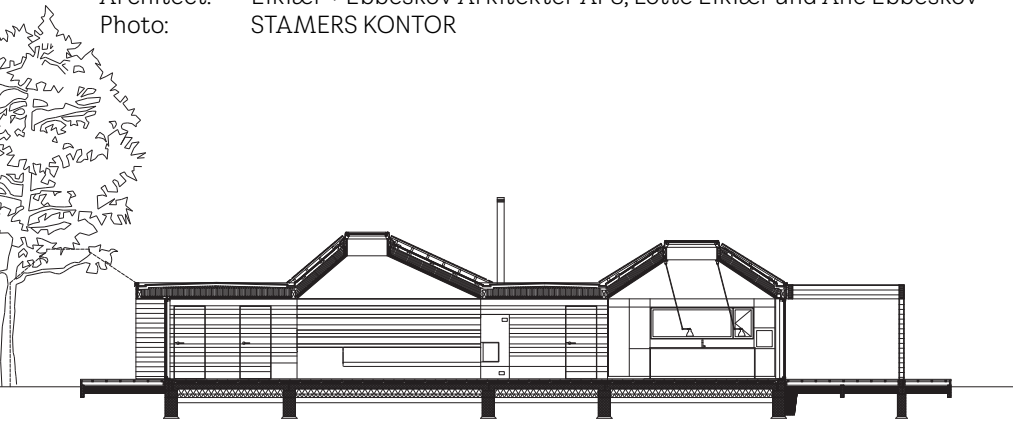


3.6 /Lining and lining shapes

Open ceiling solution

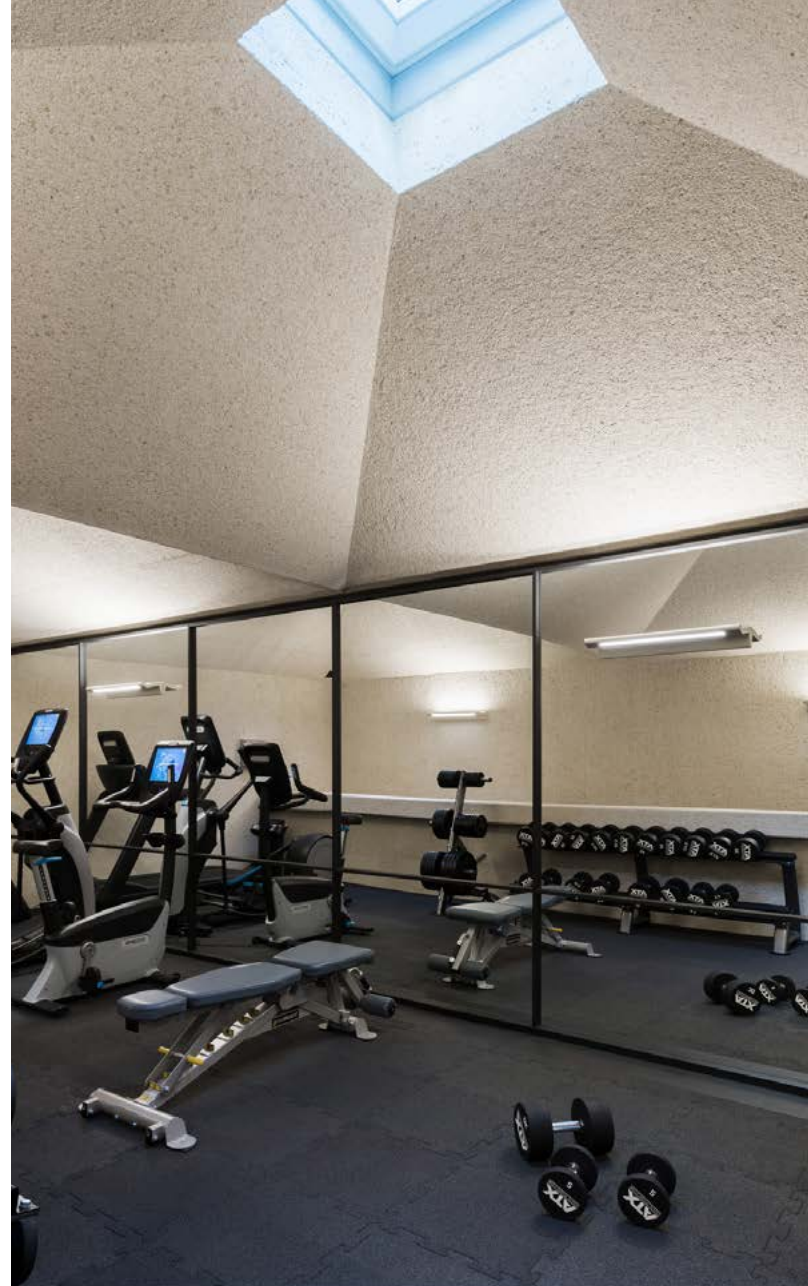
Summer huse, Rørvig, Dänemark

Architect: Elkjær + Ebbeskov Arkitekter APS, Lotte Elkjær and Ane Ebbeskov
Photo: STAMERS KONTOR



3.6 /Lining and lining shapes

Open ceiling solution



Apartment building in Kloten,
Switzerland

Architect: Züst Gübeli Bambetti



3.6 /Lining and lining shapes

LSF 2000 – VELUX system lining

Efficient finish

Designed to make installation of flat roof windows more efficient, the VELUX lining for flat roof windows includes PVC panels, vapour barrier (BBX) and facings. The VELUX Lining for windows installed in roofs with pitches between 0-5° can be used with all VELUX flat roof windows.



Max. height 70 cm



3.6 /Lining and lining shapes

— Narrow on site made lining



Photo: Andrea Segliani



Photo: Andrea Segliani



Photo: Andrea Segliani

Smoke ventilation system
for flat roofs



3.7 /Smoke ventilation system

Flat roof Smoke ventilation system



CSP
Flat roof window with
pre-installed motor unit

2 **KFC 210**
Control system



3 **KFK 100**
Break-glass point



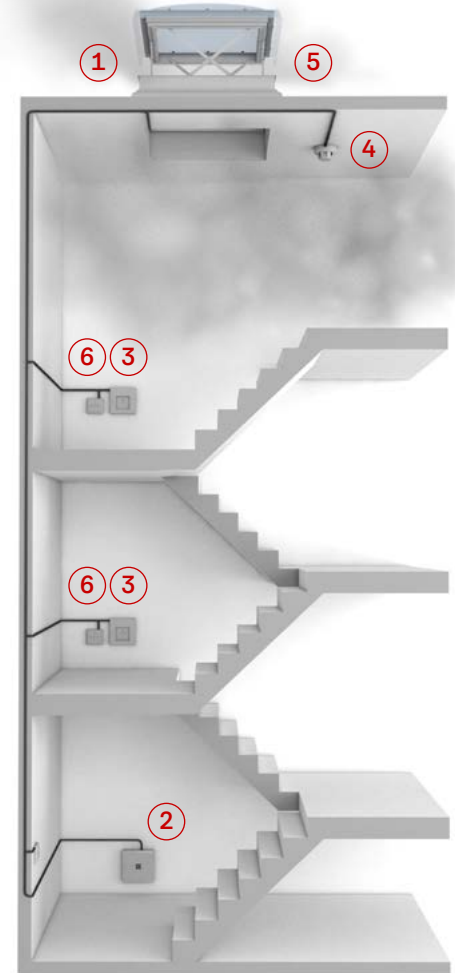
4 **KFA 100**
Smoke detector



5 **KLA 200**
Rain sensor

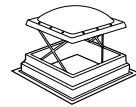
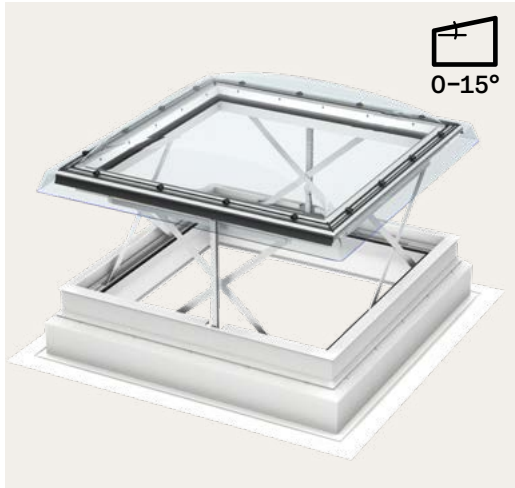


6 **KFK 200**
Ventilation switch



3.7 /Smoke ventilation system

CSP flat roof window with pre-installed motor unit



CSP

3 x 1,5 mm² up to 8 m
 3 x 2,5 mm² up to 14 m
 3 x 4 mm² up to 22 m
 3 x 6 mm² up to 33 m



KLA 200

3 x 0,5 mm² up to 100 m



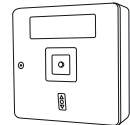
KFA 100

2 x 0,5 mm² up to 100 m



KFK 100



6 x 0,5 mm² up to 100 m



KFC 210 / 220

- Mains powered smoke ventilation window for flat roofs
- CE-marked in accordance with EN 60335-2-103
- Opening for smoke ventilation: 500 mm
- Opening for comfort ventilation: 150 mm
- Hidden lifting devices and motors
- Frame height: 300 mm
- Wear-resistant, high quality white PVC frame
- Low energy insulating glass unit
- Protective dome
- Maintenance-free surfaces

Available sizes and technical parameters

		
Smoke ventilation window CSP size (mm)	100100 1000 × 1000	120120 1200 × 1200
$U_{rc,ref300}$ (W/m ² K)	0,99 ($A_{rc,ref300} = 3,4 \text{ m}^2$)	
Reaction to fire	B-s1,d0	
Geometric area A_v , m ²	1.13	1.48
Aerodynamic free area A_a , m ²	0.47	0.64

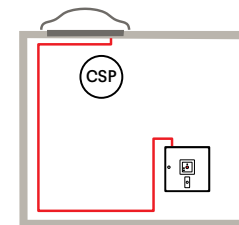
3.7 /Smoke ventilation system

CSP flat roof window with pre-installed motor unit



Required cabling

Min. cable gauge	Max. cable length
3 × 1,5 mm ²	8 m
3 × 2,5 mm ²	14 m
3 × 4 mm ²	22 m
3 × 6 mm ²	33 m



Smoke and heat exhaust system VELUX
 Certification in accordance with EN 12 101-2:2003

* For installation of the control system or control system units as well as for the preparation of cabling for connection of the motor unit is authorized only by eligible person (according to the currently valid decrees on the connection of heavy-current equipment). Initial commissioning as well as necessary periodic review is provided by a person commissioned by the manufacturer or fire engineer.

EN 12 101-2	Flat roof window
operational reliability (Re)	Re 1 000 + 10 000
opening under load (SL)	SL 1000 (CSP) / SL 500 (CSP 120120)
low temperature (T)	T (-15)
resistance to heat (B)	B 300
reaction to fire	B-s1, d0



Family Hotel Amarin, Croatia

Architect: Studio up
Photographer: Robert Leš

3.7 /Smoke ventilation system

System elements



Control system KFX 210

Control system containing control unit with integrated fire alarm and ventilation switch, separate alarm fire switch and separate smoke sensor.

- Integrated backup power supply with capacity 72 hours
- For incorporation into masonry or with a frame for wall dimensions 368x353x99 mm
- Possibility of connection to superior alarm devices systems
- Primary power supply: 230 V AC/50 Hz ($\pm 10\%$)
- Power consumption: max 250 W

Control unit KFC 210

Control unit for 1 piece of roof window CSP

- Integrated backup power supply with capacity 72 hours
- Metal box for wall installation
- Dimensions 398x393x127 mm
- Weight including batteries 8.0 kg
- Possibility to connect to superior alarm systems
- Color: white (RAL 9016)
- Primary power supply: 230 V AC/50 Hz ($\pm 10\%$)
- Power consumption: max 250 W

Control unit KFC 220

Control unit for 2 pieces of roof window CSP

- Integrated backup power supply with capacity 72 hours
- Metal box for wall installation
- Dimensions 398x393x127 mm
- Weight including batteries 8.6 kg
- Possibility to connect to superior alarm systems
- Color: white (RAL 9016)
- Primary power supply: 230 V AC/50 Hz ($\pm 10\%$)
- Power consumption: max 500 W

3.7 /Smoke ventilation system

Additional elements of the system



VELUX break-glass point
KFK 100

Switch for function activation
smoke venting.

- Colour: grey (RAL 7047)
- Dimensions: 125x125x36 mm (WxHxD)
- Maximum 10 pcs switches can be mounted to 1 control unit VELUX
- Visual and acoustic indication correct function, error and alarm (only for inclined windows roofs).
- Connection (series) via six-wire cable by min. cross section 6x0,50 mm² up to 100 m



Smoke detector
KFA 100

Smoke detector for timely fire
detection

- Colour: white (RAL 9003)
- Dimensions: 50x100 mm (HxD) incl. sleeves.
- Maximum 10 pcs sensors can be mounted for 1 control unit VELUX
- Visual indication of activation.
- Connection (series) via two-core cable by min. cross section 2x0,50 mm² up to 100 m



Rain sensor
KLA 200

Rain sensor for automatic closing
VELUX windows with smoke
ventilation in the rain if the
windows are in comfortable
ventilation.

- Colour: dark grey (NCS S 7500-N).
- Dimensions: 40x70x13 mm (WxHxD).
- Sensor does not perform its function in case the devices are under alarm
- Number of rain sensors depends on the number of control units
- Connection (series) via three-core cable by min. cross-section 3x0,50 mm² up to 100 m



Ventilation switch
KFK 200

Wall switch allowing natural
ventilation for everyday comfort.

- Colour: white (RAL 1013)
- Dimensions: 81x11x12 mm (WxHxD).
- Maximum 10 pcs switches can be mounted to 1 control unit VELUX
- Connection (series) via three-core cable by min. cross-section 3x0,50 mm² up to 100 m

Dentist clinic, Netherlands

Architect: WTS architecten
Photographer: Irene Kievit



3.8 /Digital tools

Explore the VELUX BIM/CAD library

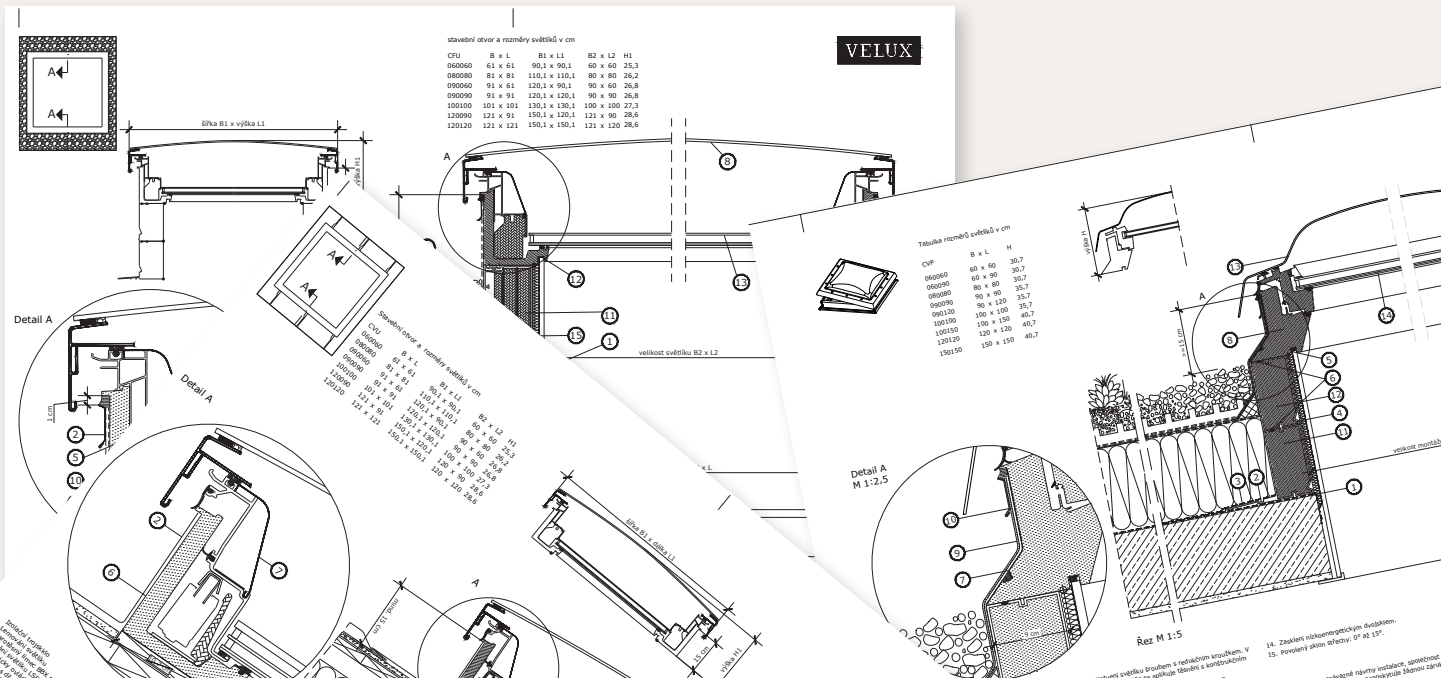
CAD/BIM
objects

bimobject®

CAD installation
drawings

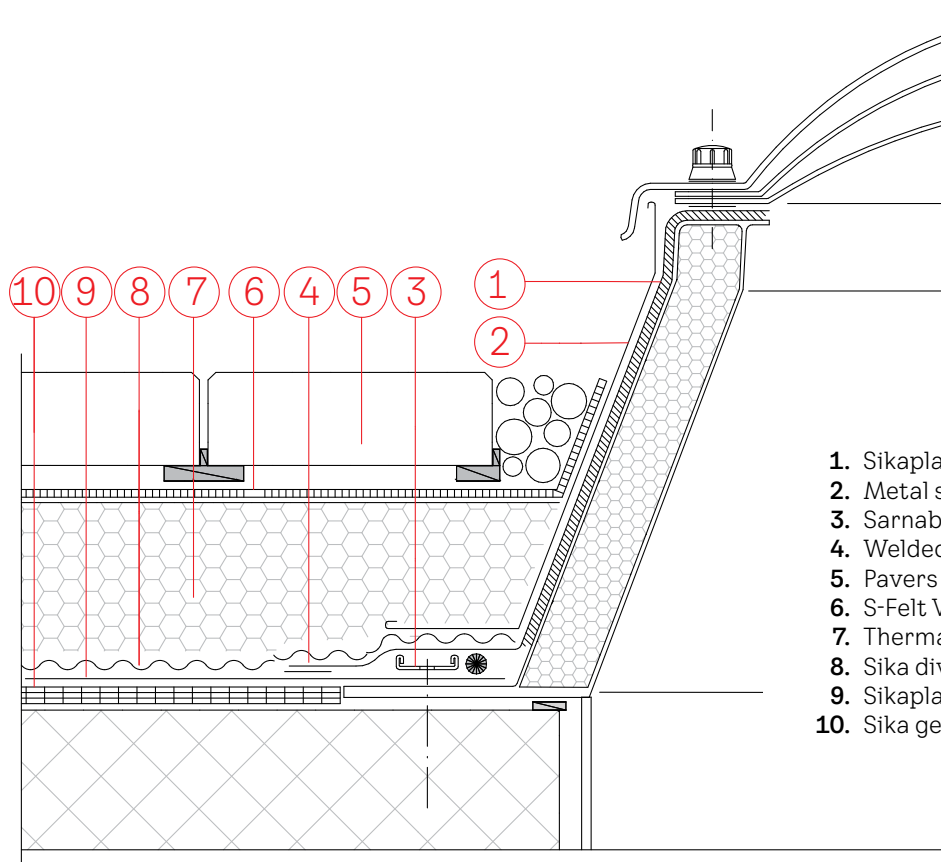
AUTOCAD
2D CAD/PDF

 AUTODESK®
AUTOCAD®



3.9 / Drawings / details

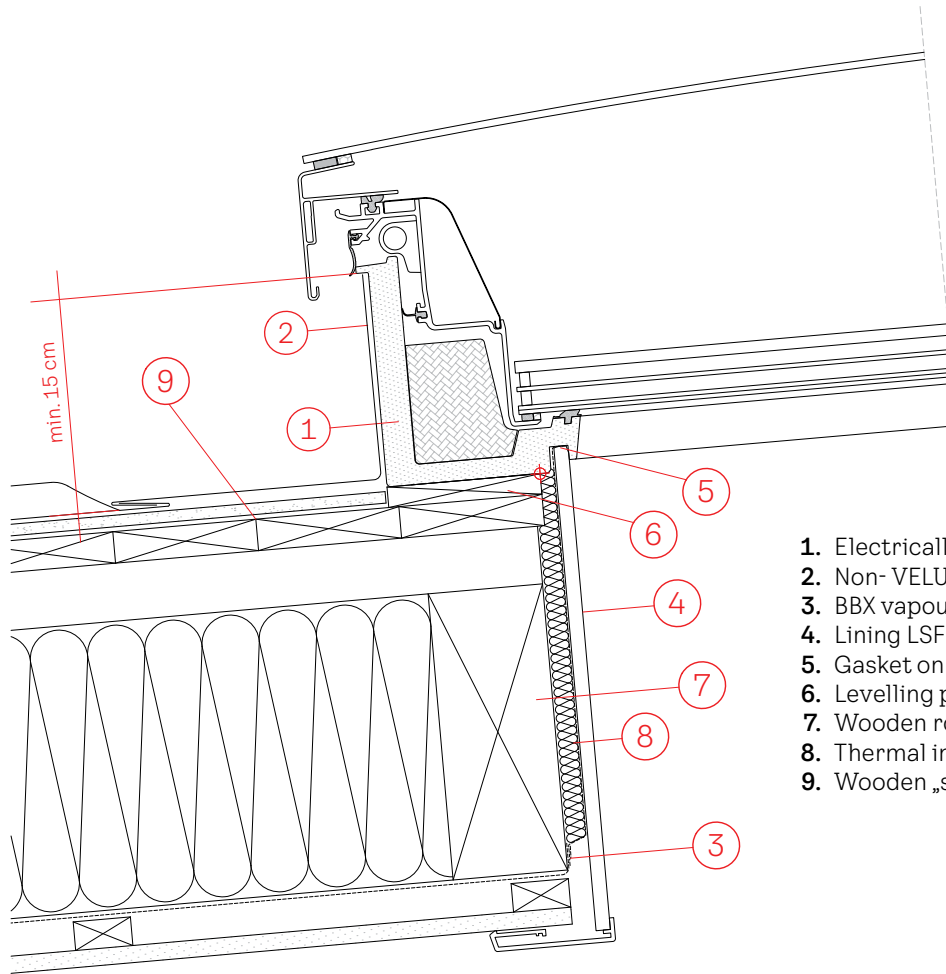
— Dome, coating covering with a walking layer



1. Sikaplan®/Sarnafil® tape, glued
2. Metal sheet
3. Sarnabar rod with synthetic rope
4. Welded joint
5. Pavers on substructure
6. S-Felt VS 140 filter layer for inverted roof
7. Thermal insulation (approved by Sika-a), specified
8. Sika dividing layer (if necessary)
9. Sikaplan®/Sarnafil® membrans, freely laid
10. Sika geotextile, leveling layer

3.9 / Drawings / details

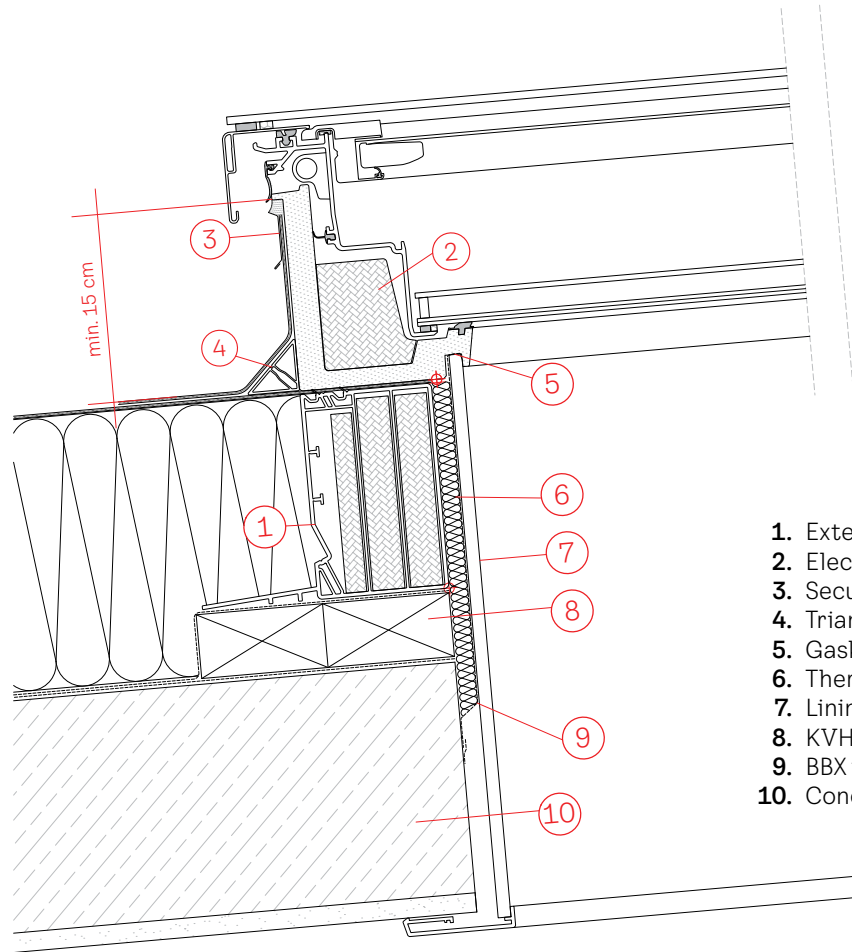
Curved glass rooflight, metal covering on the wooden roof structure



1. Electrically operated base CVU with curved glass
2. Non-VELUX flashing FRW
3. BBX vapour barrier collar connection to the vapour barrier
4. Lining LSF 2000
5. Gasket on BBX in window rebate
6. Levelling profile - wooden
7. Wooden roof structure-rafter with inter-roof insulation
8. Thermal insulation
9. Wooden „slap“ with ventilated gap

3.9 / Drawings / details

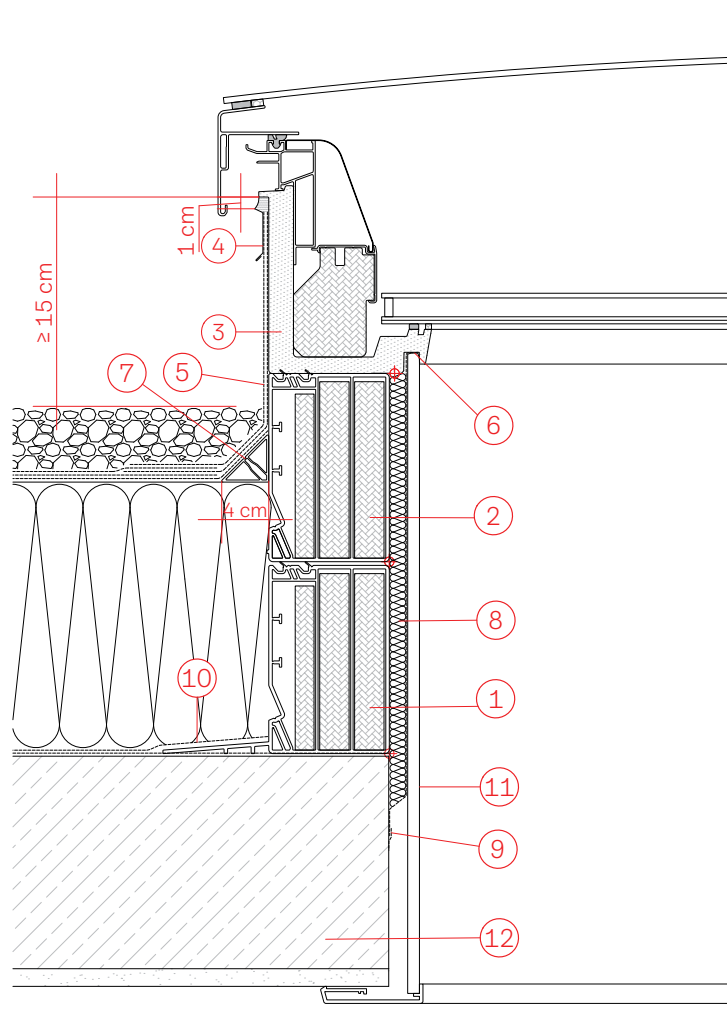
Flat glass rooflight with the extension frame, coating covering



1. Extension frame with flange ZCU 0015
2. Electrically operated rooflight base CVU with flat glass
3. Securing kit ZZZ 210U
4. Triangle list
5. Gasket on BBX in window rebate
6. Thermal insulation
7. Lining LSF 2000
8. KVH lifting profile
9. BBX vapour barrier collar
10. Concrete slab

3.9 / Drawings / details

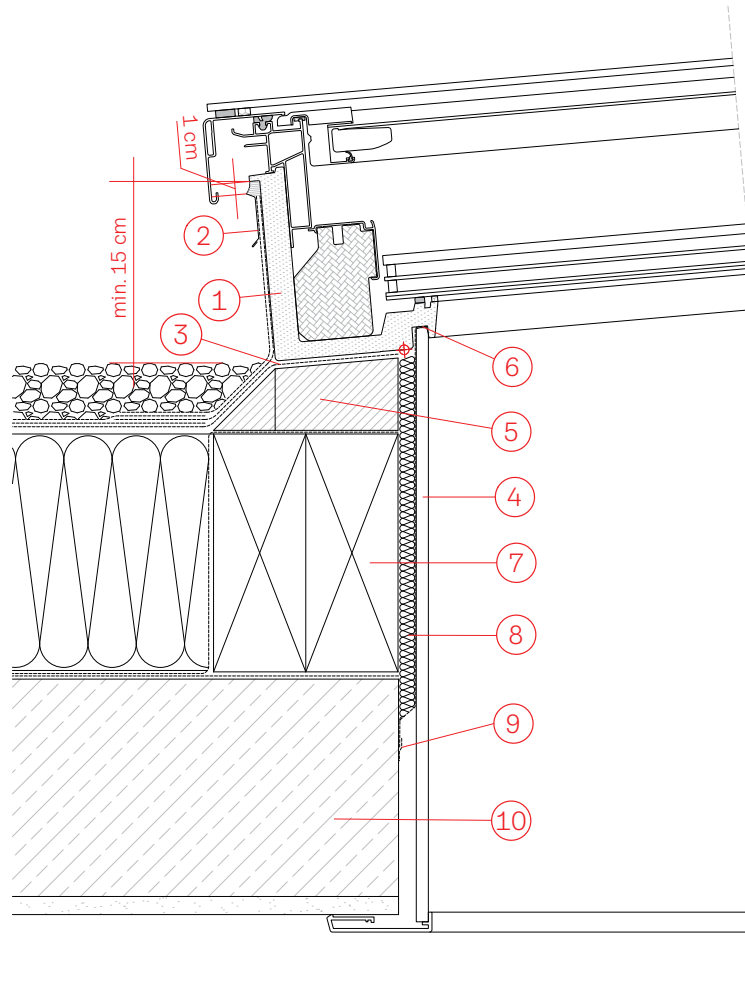
Curved glass rooflight, coating covering with the sand layer



1. Extension frame with flange ZCU 0015
2. Extension frame ZCU 1015 – max. 3 above each other
3. Non-opening rooflight base CFU with curved glass
4. Securing kit ZZZ 210U
5. Waterproofing
6. Gasket on BBX in window rebate
7. Triangle list
8. Thermal insulation
9. BBX vapour barrier collar connected to the concrete slab
10. Vapour barrier collar connected to the lifting frame
11. Lining LSF 2000
12. Concrete slab

3.9 / Drawings / details

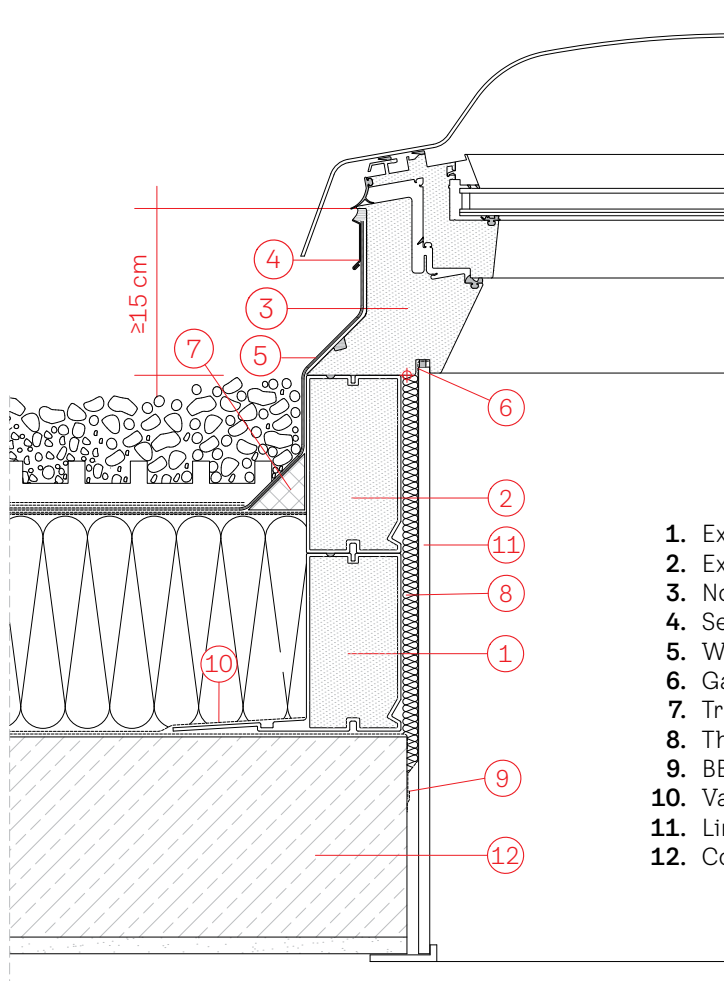
Flat glass rooflight on site made extension frame, coating covering with the sand layer



1. Non-opening rooflight base CFU with flat glass
2. Securing kit ZZZ 210U
3. Waterproofing
4. Lining LSF 2000
5. Rooflight inclination 2-15°
6. Gasket on BBX in window rebate
7. KVVH profile bringing out the rooflight at the level of the thermal insulation
8. Thermal insulation
9. BBX vapour barrier collar connected to the concrete slab
10. Concrete slab

3.9 / Drawings / details

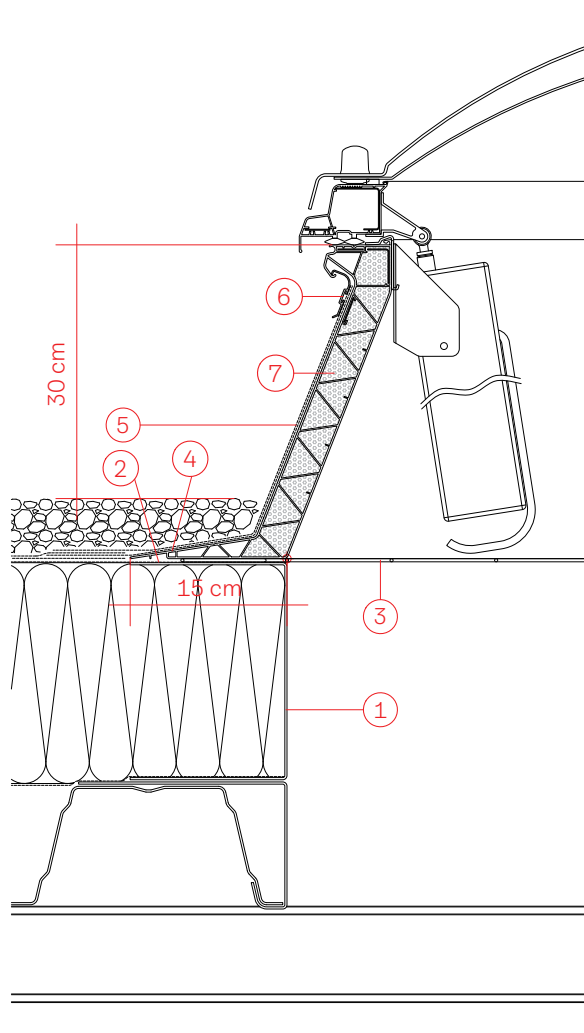
Dome with glazing with extension frame, green roof



1. Extension frame with flange ZCE 0015
2. Extension frame ZCE 1015 (max. 3 above each other)
3. Non-opening base with glazing CFP and dome ISD
4. Securing kit ZZZ 210
5. Waterproofing
6. Gasket on BBX in window rebate
7. Triangle list
8. Thermal insulation
9. BBX vapour barrier collar connected to the concrete slab
10. Vapour barrier collar connected to the lifting frame
11. Lining LSF 2000
12. Concrete slab

3.9 / Drawings / details

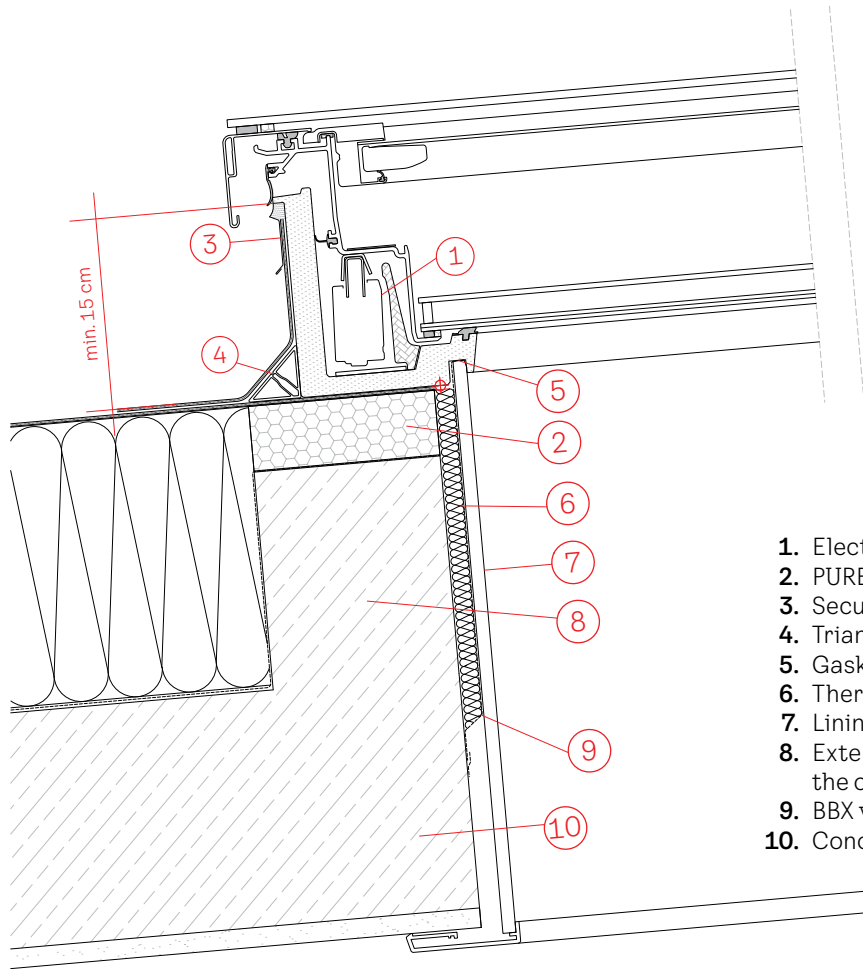
Dome, coating covering with the sand layer



1. Edge of the building envelope, supporting structures.
2. Single ply roof membrane up to the roof cut-out (OPTIONAL)
3. VELUX fall-through protection grid
4. Rooflight mounting flange
5. Roof waterproofing anchored to the skylight base
6. Securing kit - ZZZ 210J
7. Opening rooflight base (CVJ) FIX for easy and safe installation

3.9 / Drawings / details

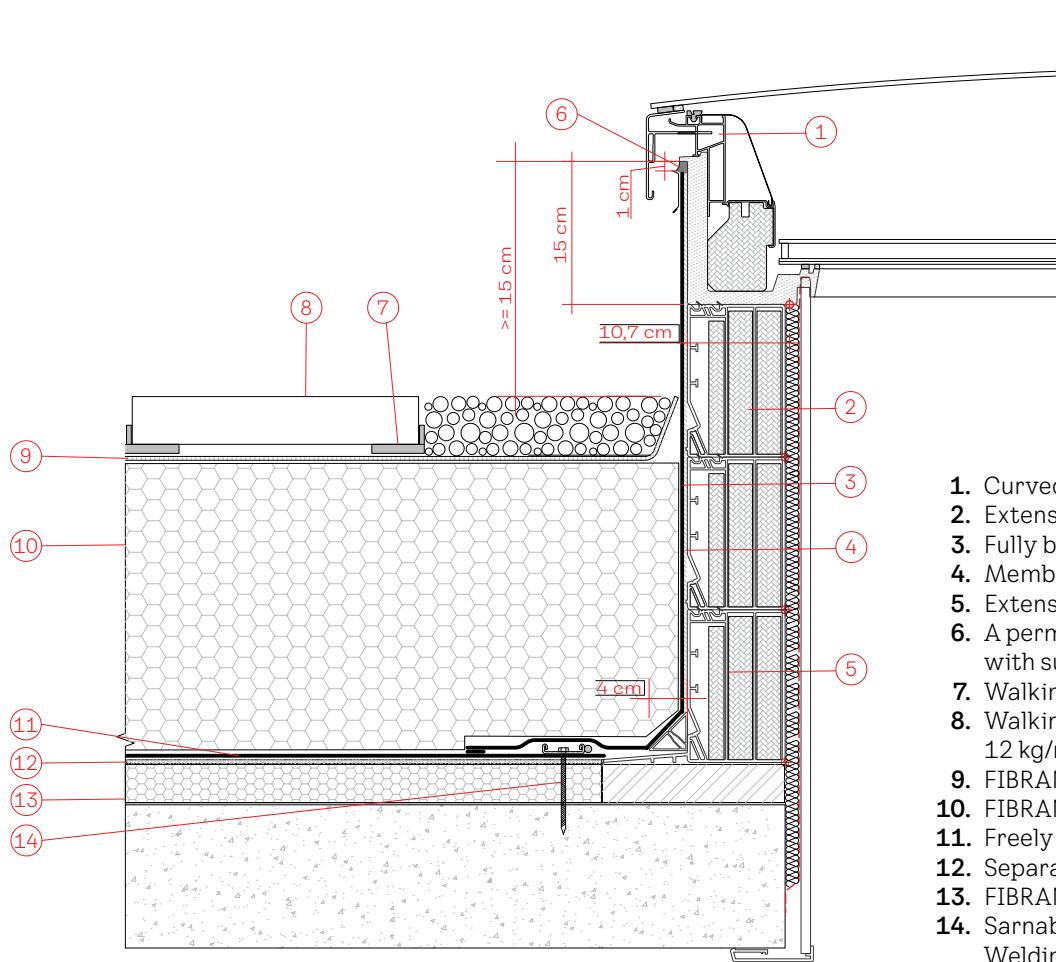
Flat glass rooflight with the extension frame from concrete, coating covering



- 1. Electrically operated rooflight base CVU + flat glass
- 2. PURENIT – thermal insulation
- 3. Securing kit ZZZ 210U
- 4. Triangle list
- 5. Gasket on BBX in window rebate
- 6. Thermal insulation
- 7. Lining LSF 2000
- 8. Extension – concrete monolith connected to the ceiling slab
- 9. BBX vapour barrier collar
- 10. Concrete slab

3.9 / Drawings / details

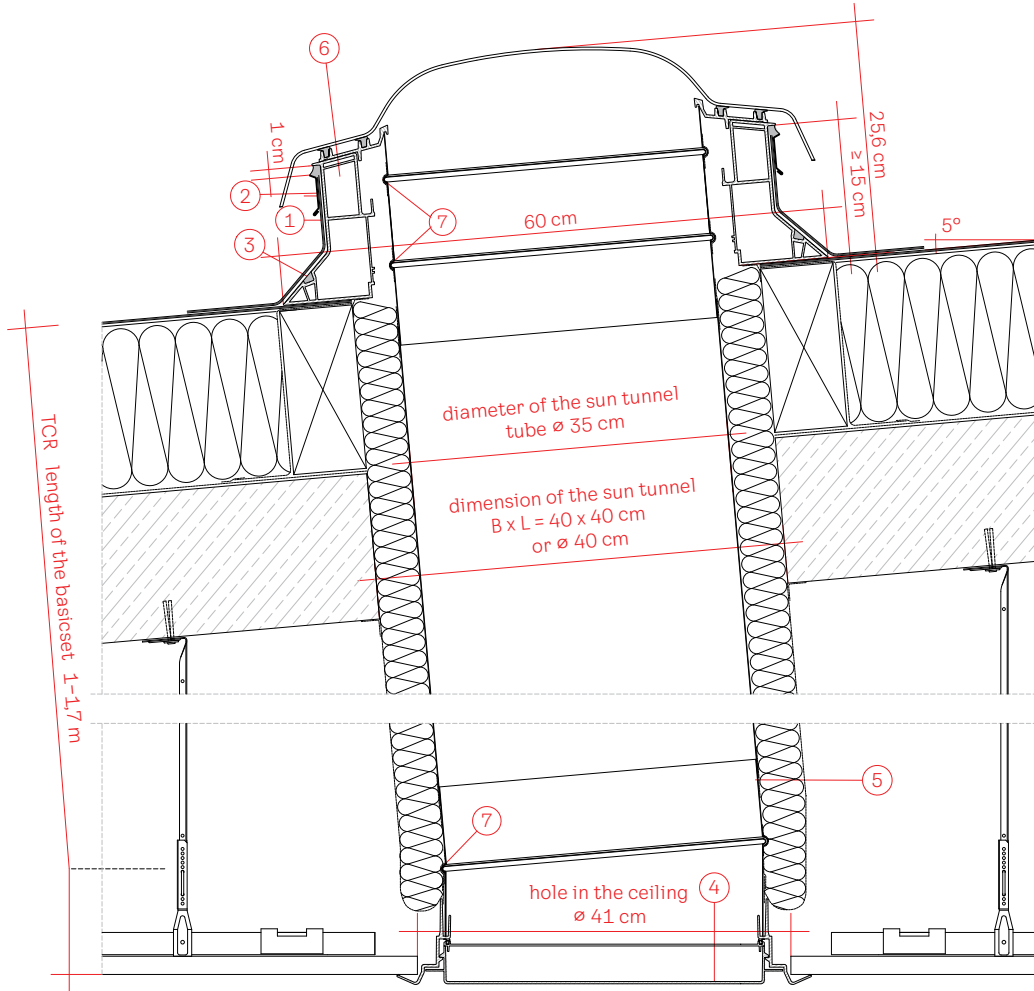
Flat glass rooflight, coating covering with a walking layer, Sika insulation



1. Curved glass rooflight
2. Extension frame ZCU 1015
3. Fully bonded membrane Sarnafil® TG 66
4. Membrane glue Sarnacol® T-660
5. Extension frame with flange ZCU 0015
6. A permanently elastic sealant, such as Sikaflex®-11 FC, with suitable pre-prepared surfaces
7. Walking board holder
8. Walking boards weighing at least 12 kg/m²/ for 10 mm XPS
9. FIBRAN skin SEAL
10. FIBRANxps 300-L thermal insulation
11. Freely laid membrane Sarnafil® TG 66
12. Separation layer S-Felt A 300
13. FIBRANxps INCLINE slope insulation
14. Sarnabar® in-line membrane fixing with Sarnafil® T Welding Cord for mechanically fixed membranes

3.9 / Drawings / details

Rigid sun tunnel for flat roofs

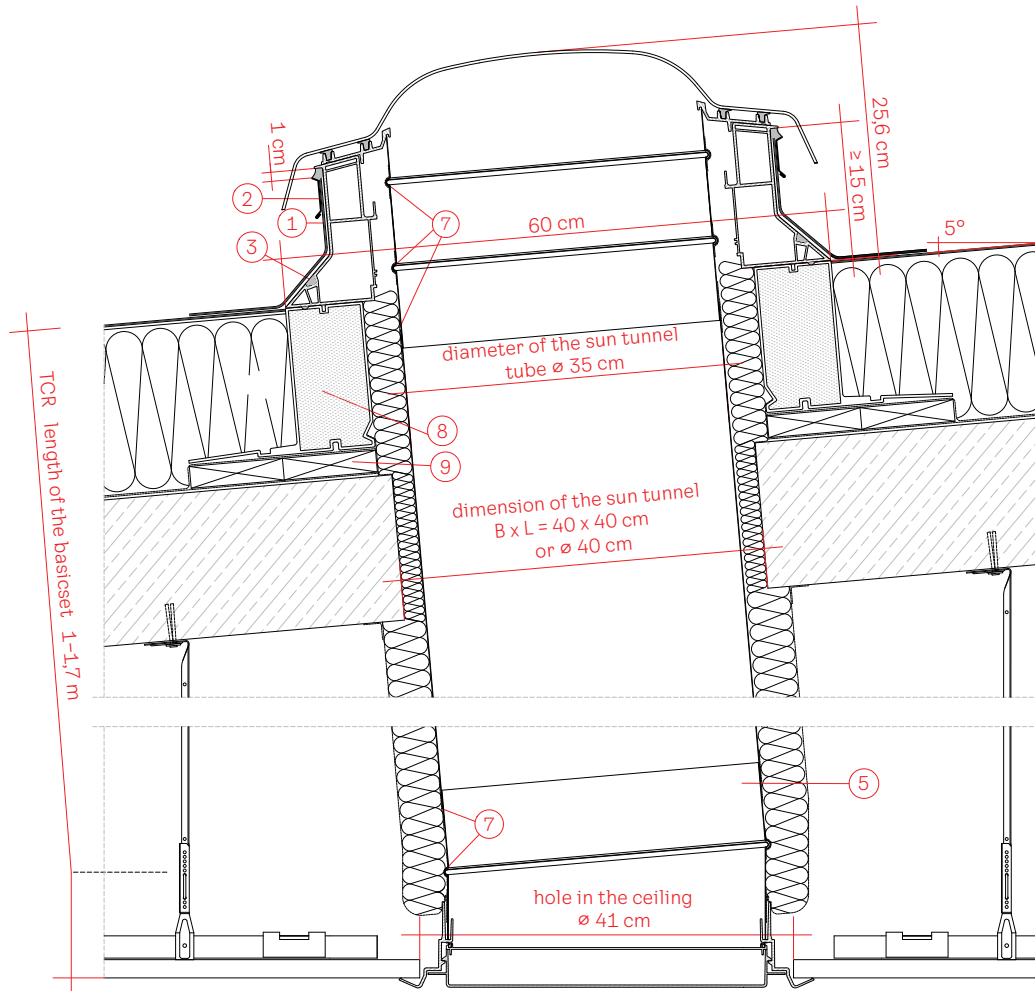


1. Pulling out and gluing the waterproofing to the frame of the sun tunnel
2. ZZZ 210 Securing kit
3. Anchoring of the sun tunnel with a bolt with a reduction ring. Sealant with structural silicone is applied at the installation point.
4. EdgeGlow diffuser (for better light diffusion)
5. Fixed tube – flat part with Flexi Loc system, for easy and quick assembly.
6. TCR fitting head – cuff in hardened PVC with acrylic dome
7. Re-joining with aluminium tape.

Permissible roof pitch: 0° to 15°.

3.9 / Drawings / details

Rigid sun tunnel for flat roofs with extension frame

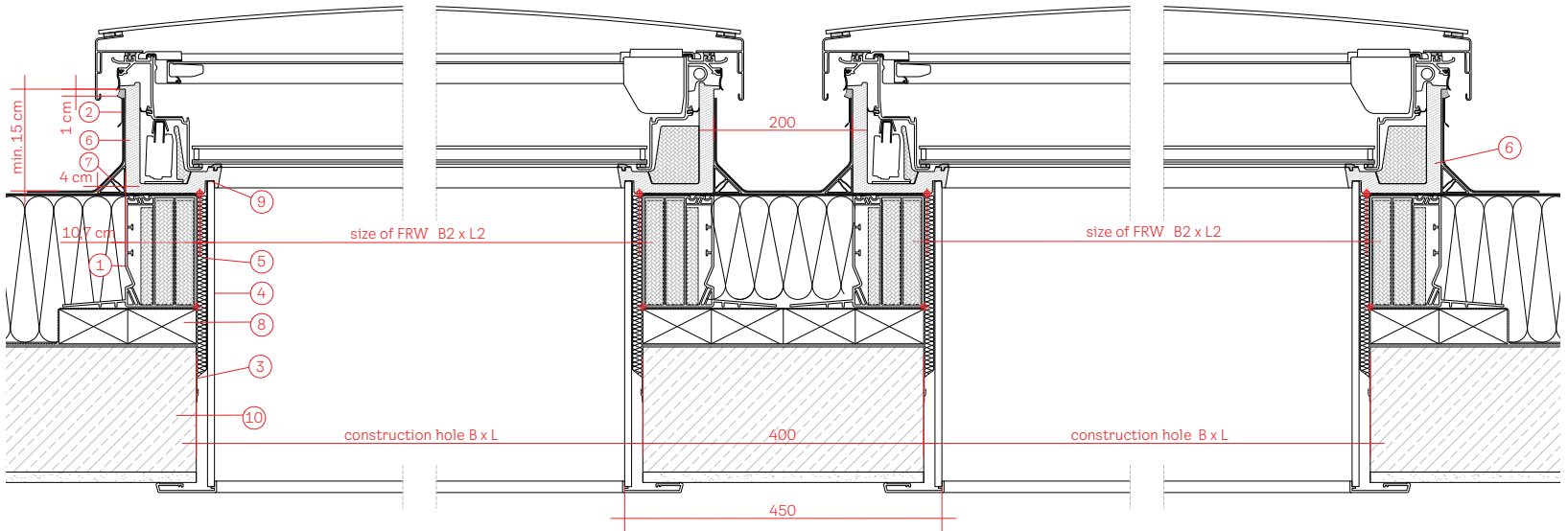


1. Pulling out and gluing the waterproofing to the frame of the sun tunnel
2. ZZZ 210 Securing kit
3. Anchoring of the sun tunnel with a bolt with a reduction ring. Sealant with structural silicone is applied at the installation point.
4. EdgeGlow diffuser (for better light diffusion)
5. Fixed tube - flat part with FLexi loc system, for easy and quick assembly.
6. TCR fitting head - cuff in hardened PVC with acrylic dome
7. Re-joining with aluminium tape
8. Extension frame with flange ZCE 0015
9. Underlay part from KVH

Permissible roof pitch: 0° to 15°.

3.9 / Drawings / details

Standard combination of flat roof windows

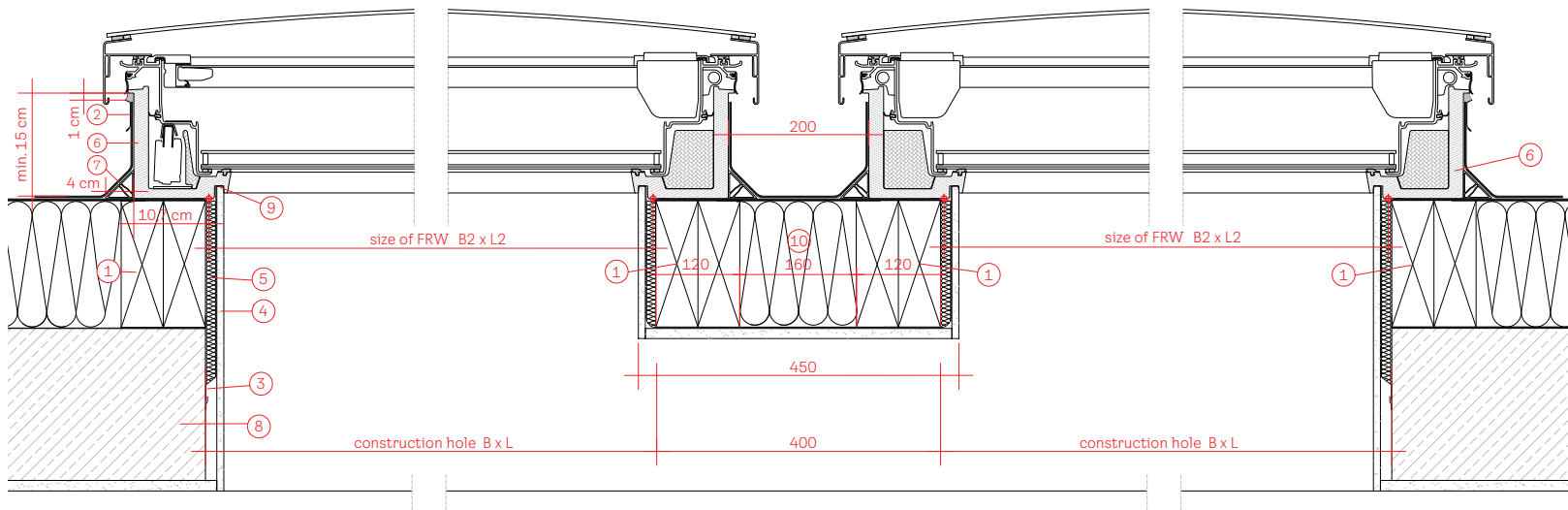


1. Extension frame with flange ZCU 0015
2. Securing kit ZZZ 210U
3. BBX vapour barrier collar
4. Lining LSF 2000
5. Thermal insulation

6. Electrically operated CVU
7. Triangle list
8. KVH lifting profile
9. Gasket on BBX in window rebate
10. Concrete slab

3.9 / Drawings / details

Combination of flat roof windows



1. KVH profile 2x 60/180
2. Securing kit ZZZ 210U
3. BBX vapour barrier collar
4. Lining
5. Thermal insulation

6. Electrically operated CVU
7. Triangle list
8. Concrete slab
9. Gasket on BBX in window rebate
10. Thermal insulation - PUREN

www.velux.com



Transforming Spaces