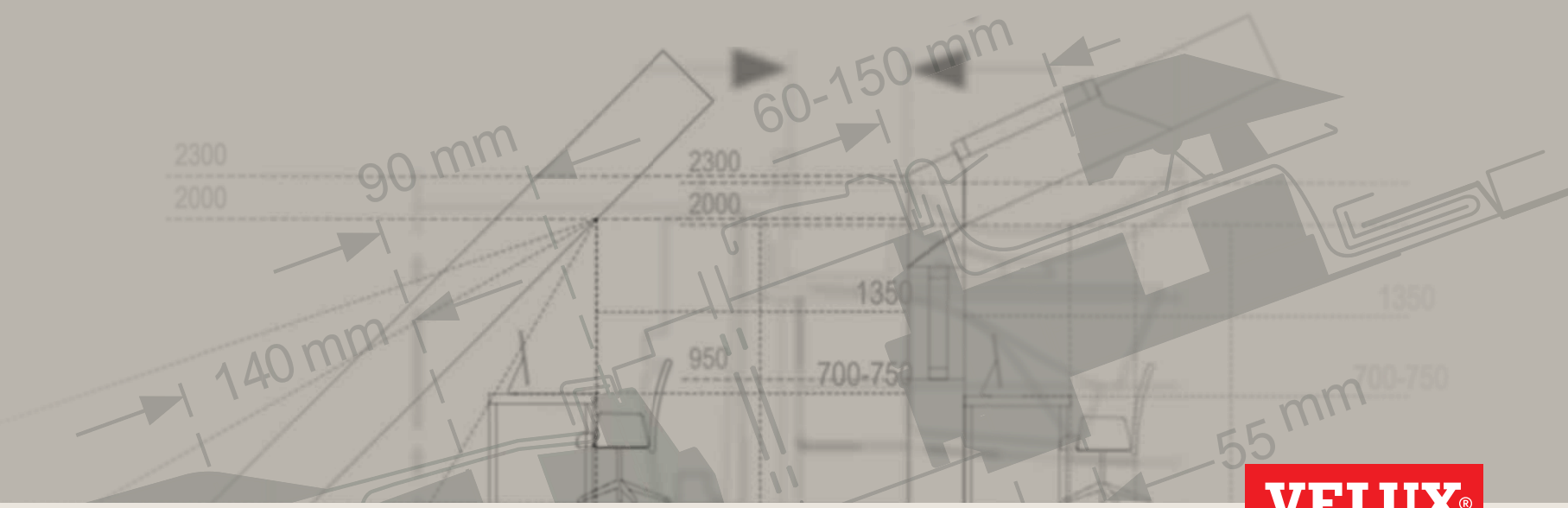


VELUX®

Design Guide

Version 2.01

Design Guide

Basics

Rooms in the attic

Technical solutions

01/ Basics

Basics

1.1 Overview of roof design

1.2 Basic requirements

1.3 Optimal use of the attic

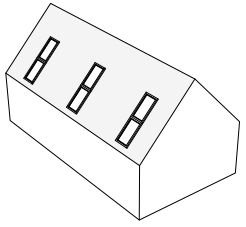
1.4 Attic ergonomics

1.5 Roof windows / types, methods of control

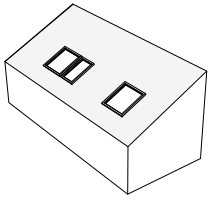
1.1 /Overview of roof design

Common roof types

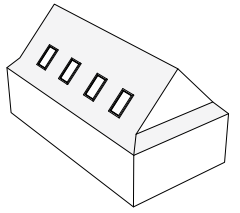
gable roof



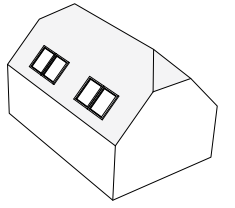
skillion roof/shed roof



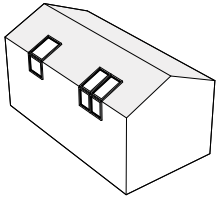
dutch gable roof



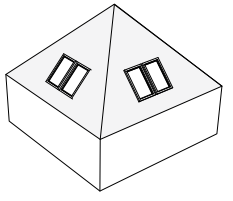
half-hipped roof



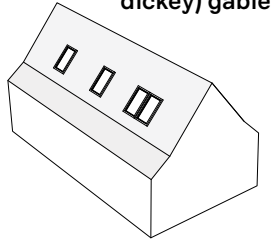
gable roof with high attic parapet



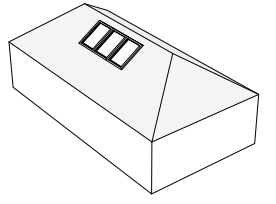
pyramid hip roof



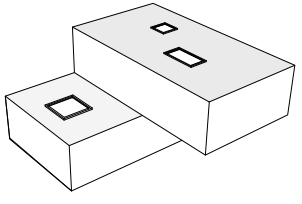
polynesian (gullwing/ dickey) gable



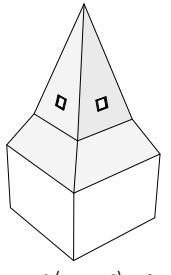
hip roof



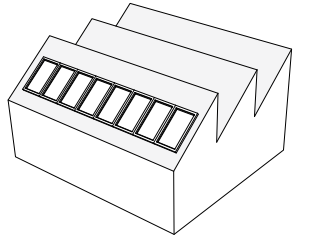
flat roof



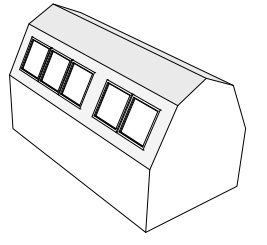
tower roof

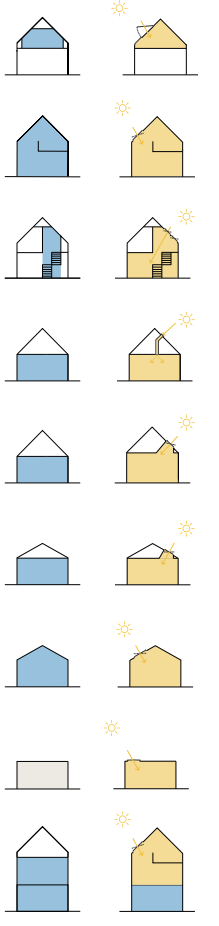


saw tooth roof



gambrel roof/Mansard roof





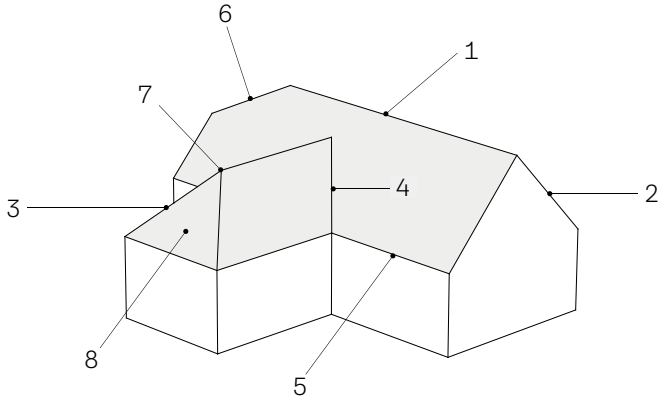
We illuminate every roof.

Additional roof types that could be useful: mansard (actual), a frame, catslide/saltbox, lean to, butterfly

1.1 /Overview of roof design

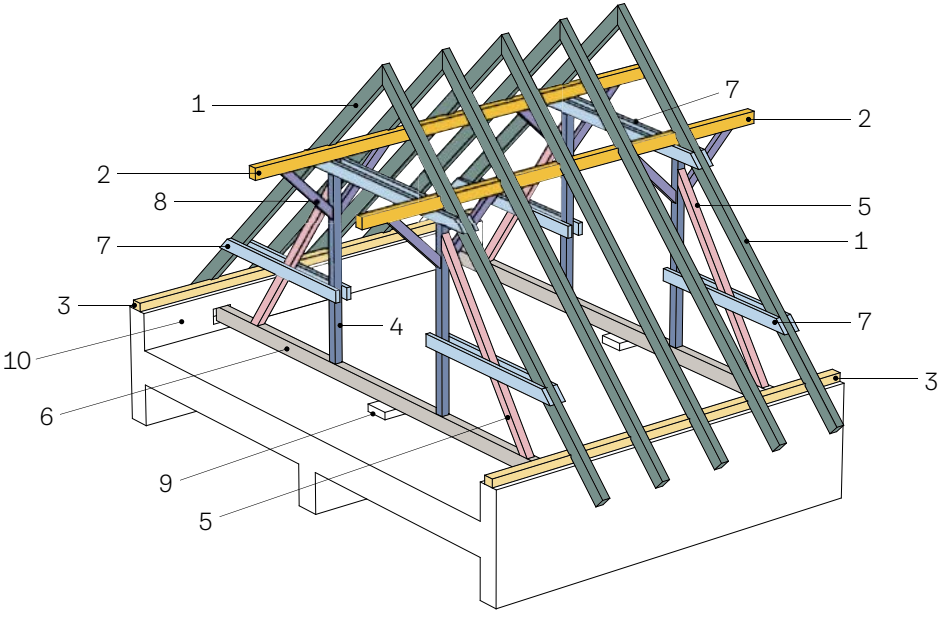
Terminology

roof coverings



1 – roof ridge
2 – gable wall
3 – hip
4 – valley/valley gutter
5 – gutter
6 – half hip end
7 – hip point
8 – hip end

basic elements of the roof truss



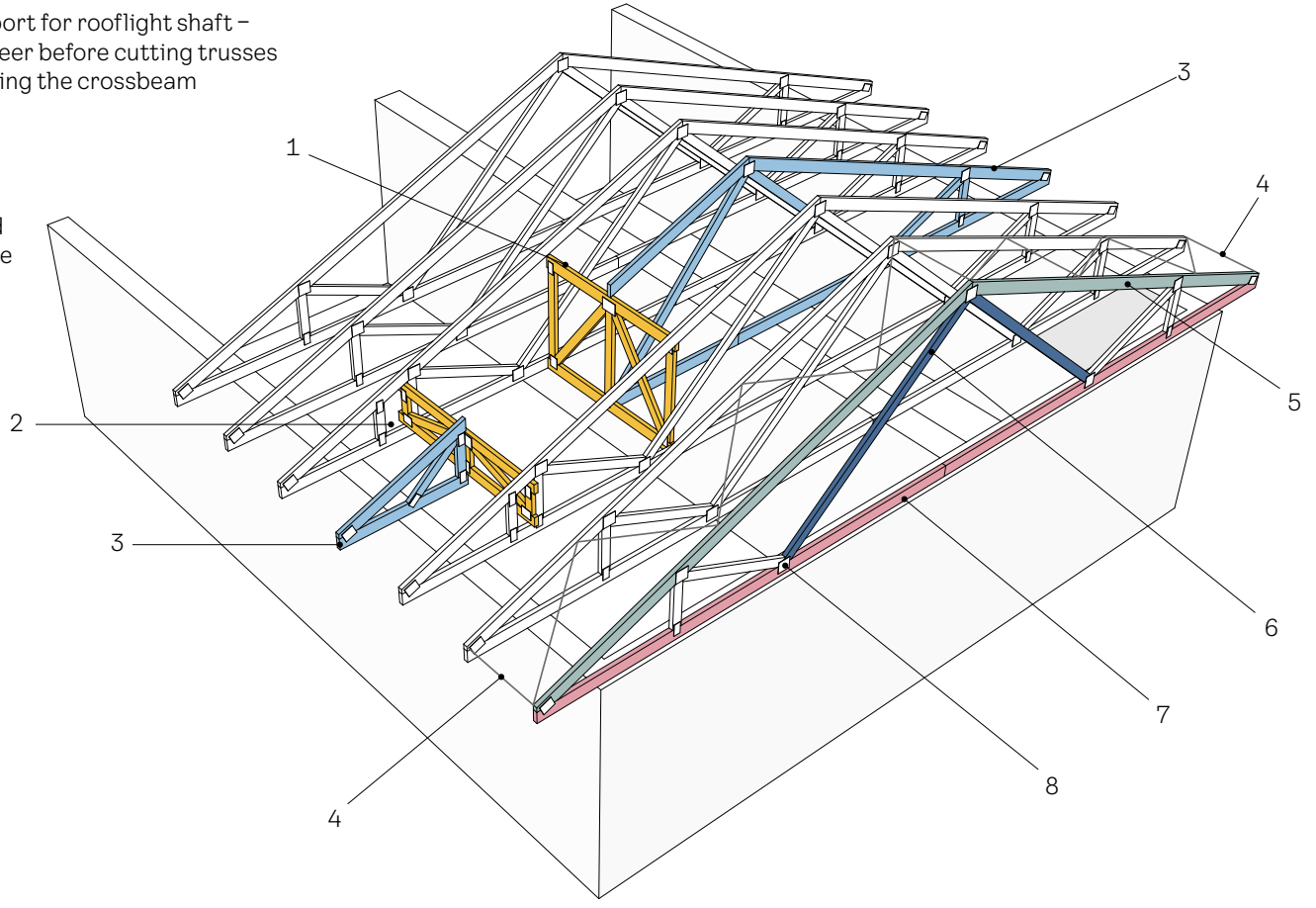
1 – rafter/top chord
2 – purlin
3 – wall plate
4 – queen post/framing
5 – inclined struts
6 – bottom chord/tie collar
7 – upper and lower tie beams
8 – straps
9 – beam support
10 – external wall/parapet wall (structural/load bearing)

1.1 /Overview of roof design

Terminology

roof trusses elements

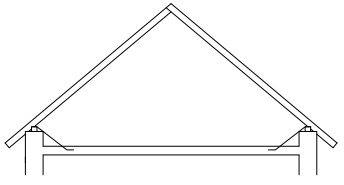
1 – trimmer support for rooflight shaft – consult engineer before cutting trusses
2 – slot for inserting the crossbeam
3 – split truss
4 – wind bracing
5 – top chord
6 – web
7 – bottom chord
8 – gang nail plate



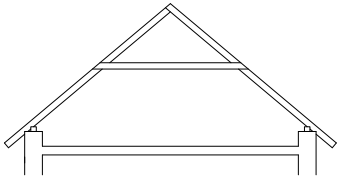
1.1 /Overview of roof design

Roof trusses – division of trusses according to the type of main connection / structure

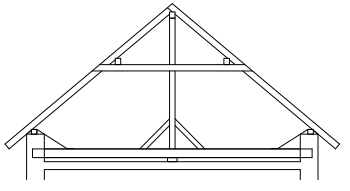
rafter system
the structure consists of pairs of RAFTERS connected at the top



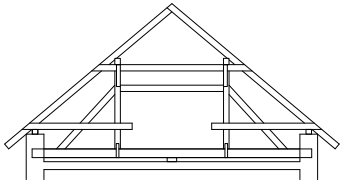
collar beam truss
formed by rafters and horizontal reinforcements



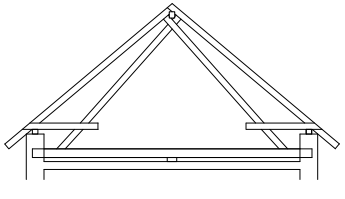
purlin binding system
with vertical posts (king post)



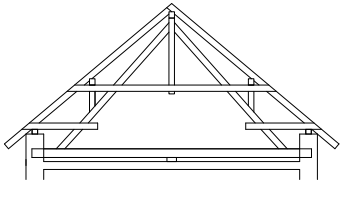
purlin binding system
queen posts



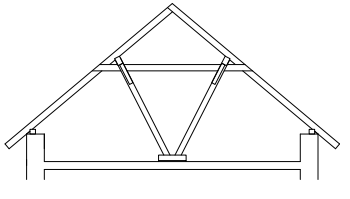
purlin binding system
with sloping posts (queen post)



purlin binding system
queen post with a strut



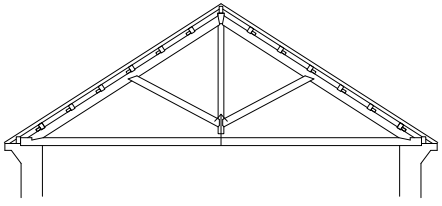
purlin binding system
queen post with a shortened tie beam



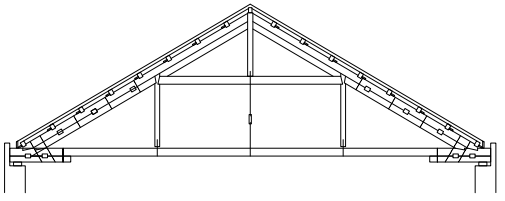
1.1 /Overview of roof design

Roof trusses – the most commonly used trusses in reconstructions

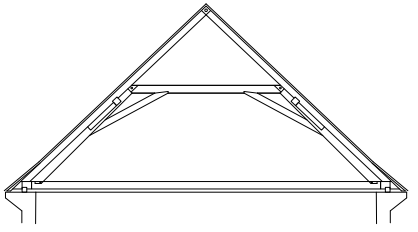
king post truss
with a king post truss; characteristic features include horizontally oriented trusses with a gutter



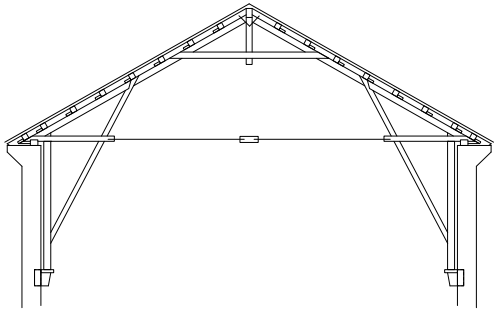
queen post truss
with three hanging trusses; characteristic features include horizontally oriented trusses with a gutter



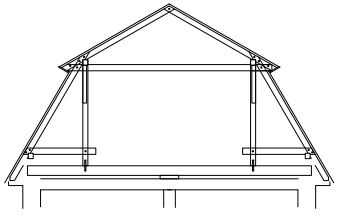
scissor truss
inclined posts fixed by horizontal struts



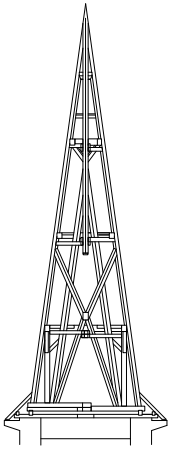
ardant truss
principle of struts and hanging truss – for roofing spans larger than 20 m



mansard truss
from two roof planes of different inclinations



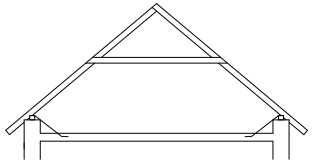
tower trusses
truss derived from a purlin system



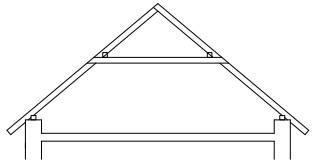
1.1 /Overview of roof design

Roof trusses – the most commonly used trusses in new buildings

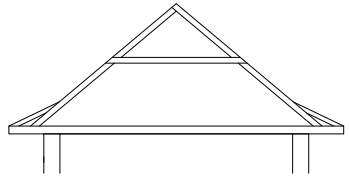
collar beam truss
with anchoring of the wall beam to the ceiling structure, suitable for family houses with residential attics and span in the range of 6–9 m



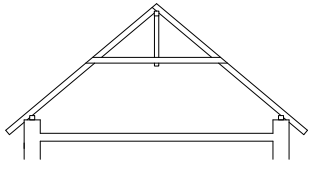
collar beam truss
with hanger rod, suitable for family houses with a residential attic and a span of 6–11 m



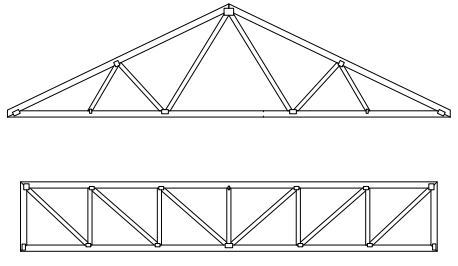
collar beam truss
with flared eaves, suitable for family houses with a residential attic with a span of 6–11 m



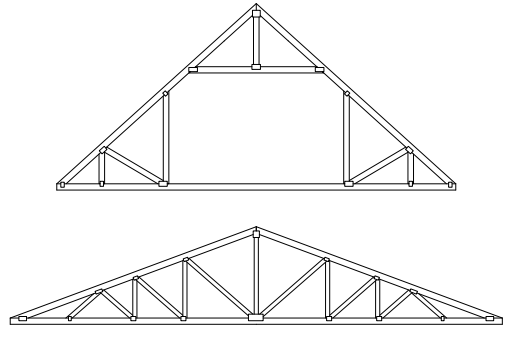
collar beam truss
with hanger rod, suitable for family houses with a residential attic with a span of 6–11 m



frame system
suitable for family houses with a non-residential/partially used attic with a span of 6–30 m



frame system
suitable for family houses with a non-residential/partially used attic with a span of 6–30 m



1.2 /Basic requirements

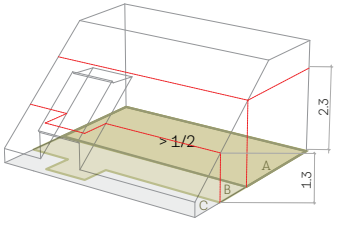
Recomendation of floor area with a sloping ceiling

Floor area in Residential buildings

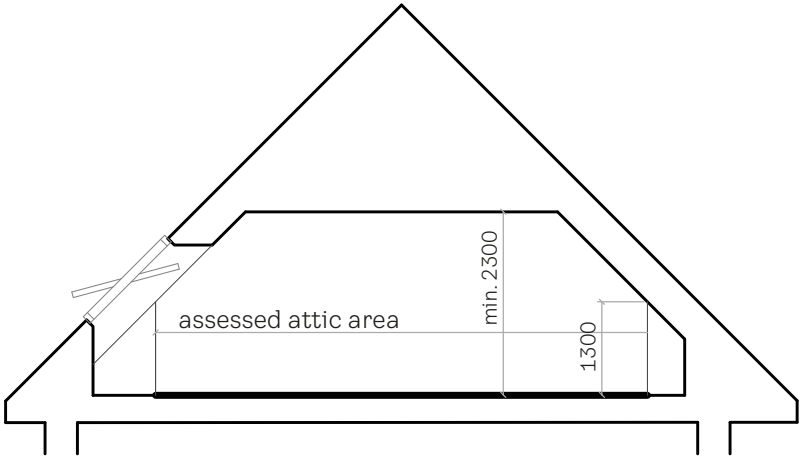
The living room should have an area of at least 8 m^2 / if the apartment consists of a single room, it should have an area of at least 16 m^2 / a room with sloping ceilings should have a height of min. 2.3 m at least above half of the floor area / this is defined by an imaginary plane perpendicular to the floor plane, intersecting the plane of the sloping ceiling at a height of 1.3 m above the floor / for sleeping of one person – 8 m^2, volume of at least 20 m^3 / for sleeping of two people a volume of at least 30 m^3.

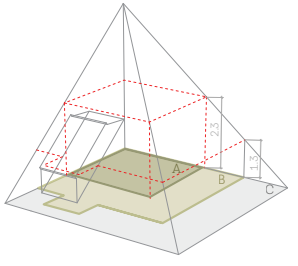
Floor space area and statement of the area
We distinguish two areas of floor space / to assess whether it is a living room or not / for the purposes of the statement of area, i.e. to determine the actual floor covering needs for a given room.

The height of the attic knee wall
The height of the attic knee wall can be theoretically zero / realistically usable height at the place of the attic knee wall is approx. 0.8 m.



The height arrangement of the attic of residential buildings is 1.3 meters according to ČSN 73 4301 Residential buildings.



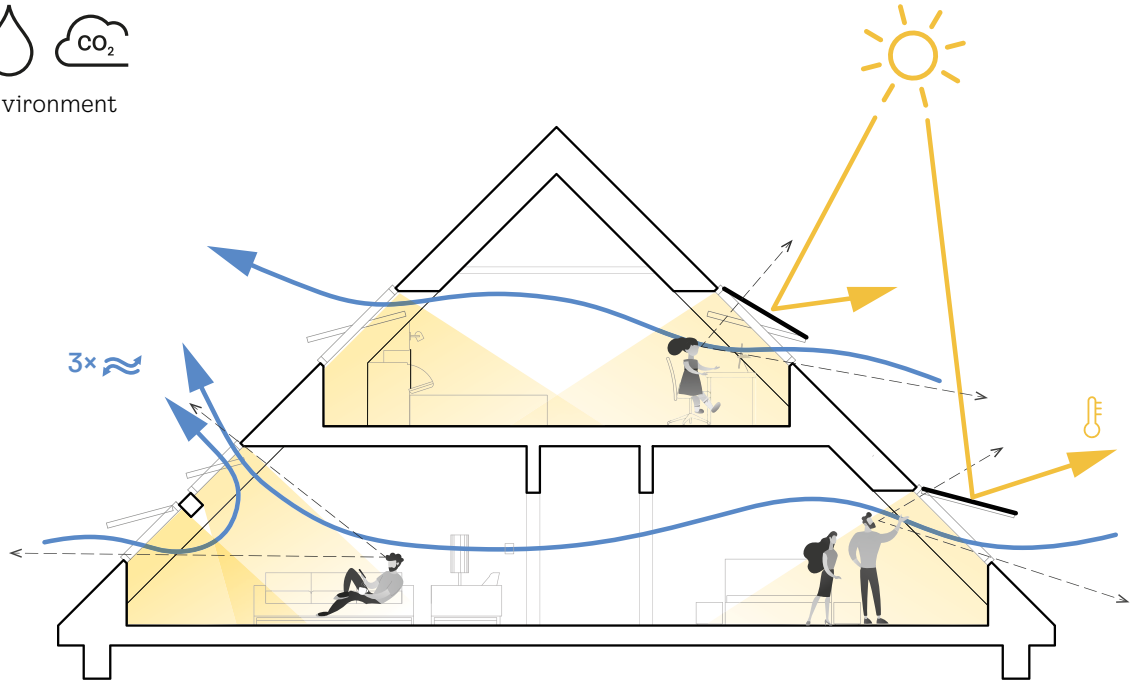


A – Clear height 2.3 m
B – Eligible area of living room min. to 1/2 of the floor
C – Total floor area of the room

1.3 /Optimal use of the attic

Requirements and recommendations for achieving quality indoor climate

indoor environment sensor



Daylight has a significant effect on the human psyche, affecting our mood and sense of well-being during the day.

1.3 /Optimal use of the attic

Requirements and recommendations for achieving quality indoor climate

Main design elements:

1. **Daylight**
   Minimization of the use of artificial lighting during the day / we assess three parameters / amount of daylight / degree of sunlight / measures against glare / three levels of daylight in interiors: minimum, medium and large / mandatory minimum level – at 50% of comparative plane DT 300 Lux and at the same time to 95% DTM 0.7% 100 Lux.

2. **Indoor air quality**
   During occupation a minimum amount of exchanged outdoor air of 25 m^3/h per person must be delivered / minimum ventilation intensity 0.5 l/h / the indicator of the quality of the indoor environment is CO_2 concentration / the concentration in the indoor air must not exceed 1500 ppm / the CO_2 value is considered to be a healthy indoor environment up to 1000 ppm / controlled ventilation recommended – e.g. automatic window opening / cross ventilation and chimney effect speeds up natural ventilation / larger room volume / tip: do not close the space above the tie beams.

3. **View**
   Daylight in buildings / visual connection with the environment, which provides information about the local conditions / we consider a horizontal angle of view (min. 14°) / length of view (min. 6 m) / number of landscape layers – sky layer / landscape layer / terrain layer (min. 1) / there are determined 3 levels of view.

4. **Temperature**
   Thermal stability of the attic is a fundamental criterion for the quality of the attic design / it is recommended to orient rooms with a larger volume of air and the possibility of effective air exchange / cross ventilation and stack effect / to design all window openings with external shading / to use automatic shading control. The difference in room temperature when using external shading can be up to 7 °C / use of construction materials with heat/cold accumulation / thermal insulation according to current requirements.

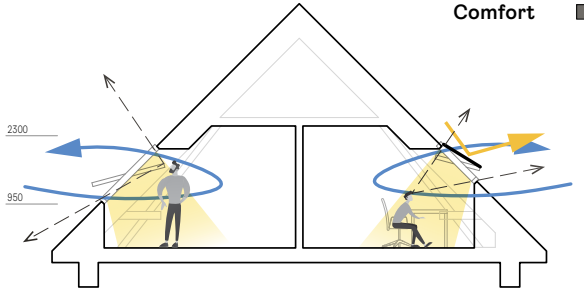
5. **Room acoustics**
   Reduction of outdoor noise by noise absorbing structures / eliminate internal noise by using materials with noise attenuation / design the layout of the room so that it allows good listening / on the street side, the roof window has an 8 dB lower noise level than the facade window / roof window to the yard by about 15 dB.

1.3 /Optimal use of the attic

Recommendations for optimising indoor comfort

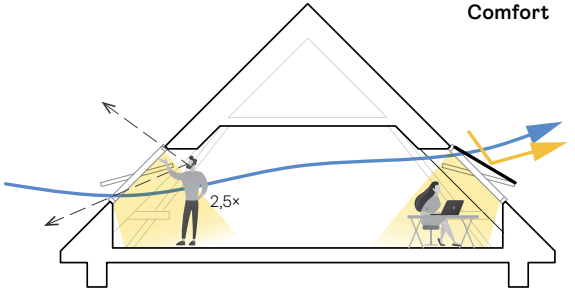
attic in single family home

Light
Vision
Ventilation
Comfort



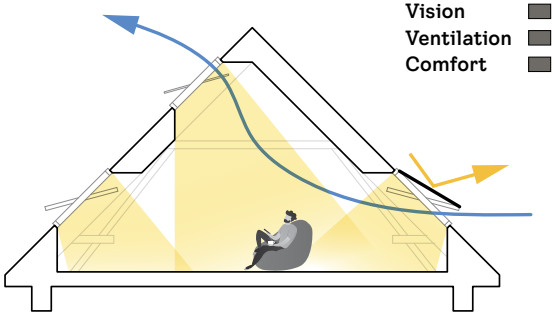
small rooms in the attic / lowered ceiling / high attic knee wall / manual control of windows and shading

Light
Vision
Ventilation
Comfort



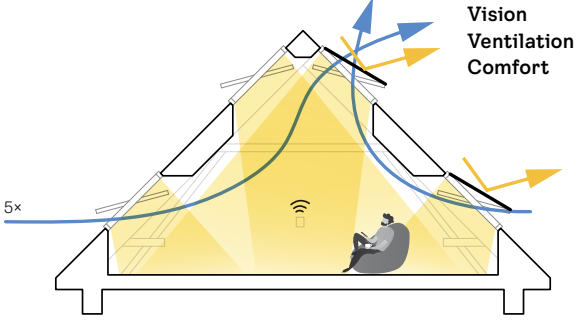
larger room / cross ventilation / lowered ceiling / manual control of windows and shading

Light
Vision
Ventilation
Comfort



larger room / lighting of the entire depth of the room / open ceiling for a larger volume of air in the room / remote-controlled windows and shading

Light
Vision
Ventilation
Comfort

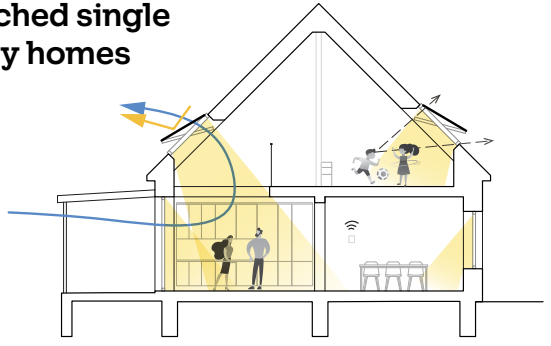


larger room / lighting of the entire depth of the room / open ceiling for a larger volume of air in the room / cross ventilation and chimney effect / automatic window control and shading

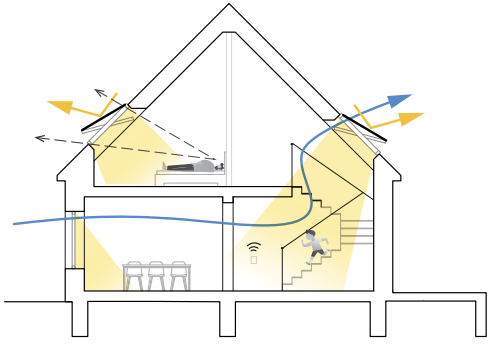
1.3 /Optimal use of the attic

Recommendations for optimising indoor comfort

detached single family homes

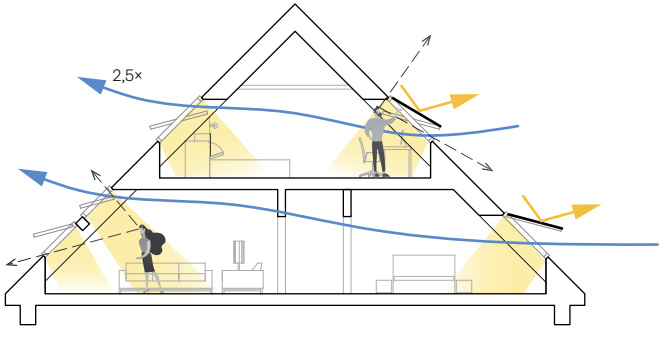


ground floor daylight through roof / daylight in the middle of the layout / efficient ventilation / design element / unique atmosphere / automatic window control

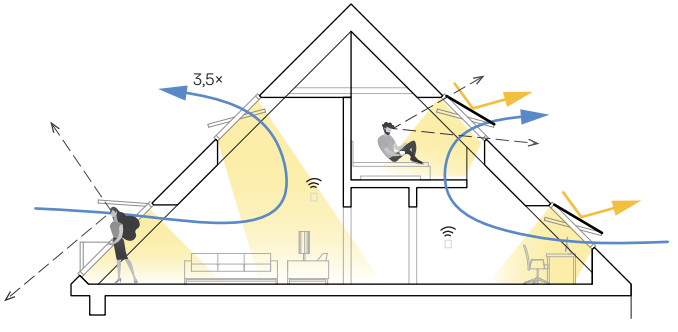


stairwell / effective natural ventilation of the family home / increased safety of movement on the staircase / design element / unique atmosphere / automatic window control

attic flats / lofts



combination of windows on top of each other in the living space / cross ventilation of the bedroom / view from the living rooms even while sitting

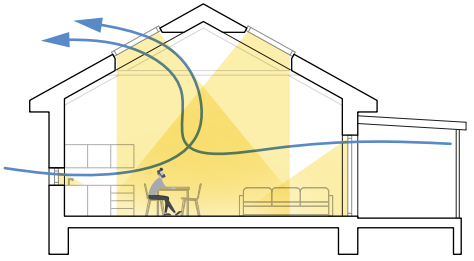


two-storey living space / larger air volume / better lighting / ventilation chimney effect / atmosphere / room with mezzanine / remote control of high windows

1.3 /Optimal use of the attic

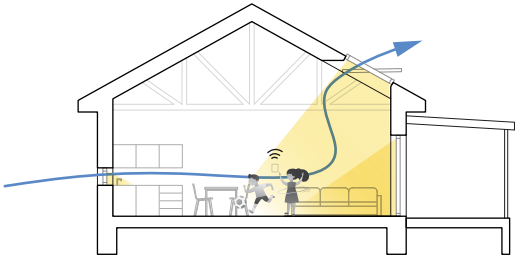
Recommendations for optimising indoor comfort

single story, open structure



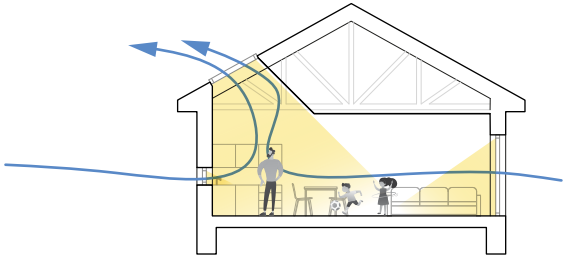
visual construction of trusses over a selected part of the layout / unique atmosphere / enough light in the entire depth of the room / effective ventilation

single story, exposed trusses



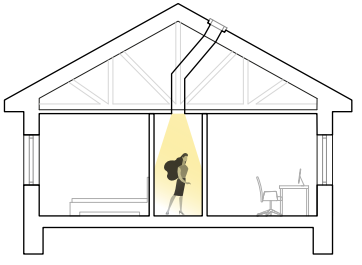
creation of a great visual impression by opening into the truss space / optical enlargement of the space with sufficient daylight intensity / even lighting of the room from above / larger volume of air in the room / controlled natural ventilation with chimney effect

single story, light shaft



targeted lighting of a specific part of the layout / freeing up space for upper cabinets thanks to the use of a light shaft / effective ventilation through high-set windows / structurally small intervention in the truss

single story, sun tunnel

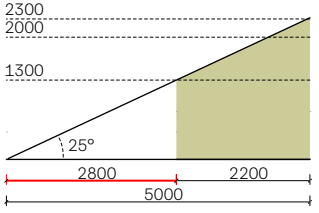


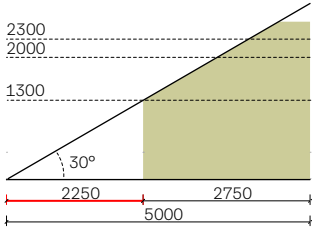
bright impression of otherwise dark, internal spaces / simple way to naturally illuminate small, central rooms / design solution

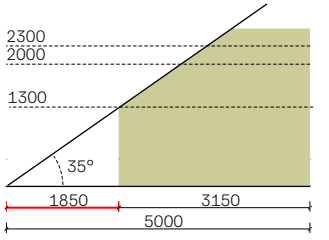
1.3 /Optimal use of the attic

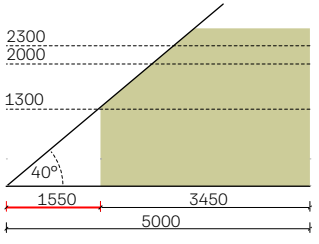
Useable attic space dependent on roof slope

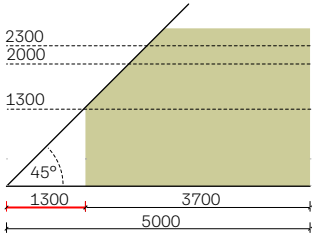
attics with a higher roof pitch are more easily utilised.

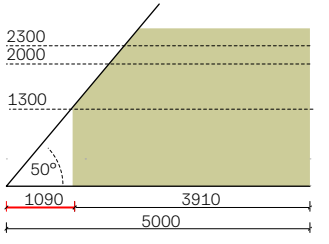








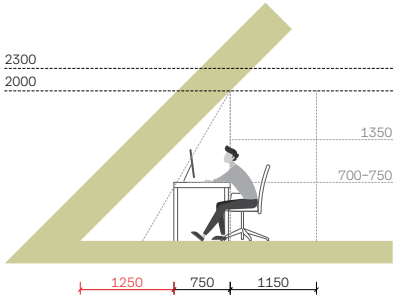


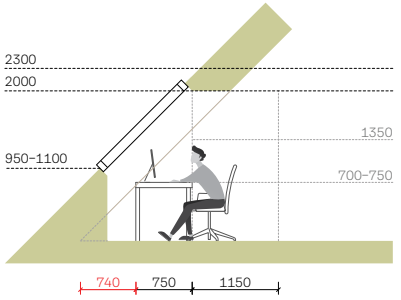


1.4 /Attic ergonomics

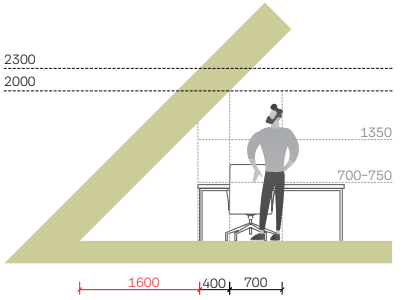
Basic ergonomics for placing furniture under a 45° slope

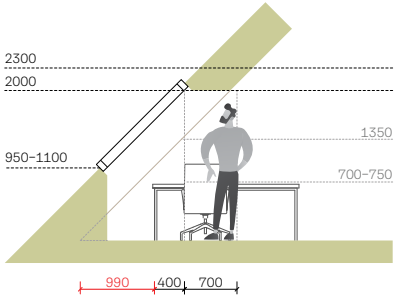
desk location





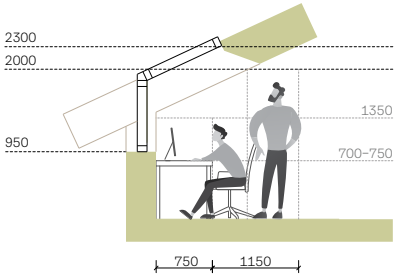
better use of space / targeted lighting of the work surface / perfect view



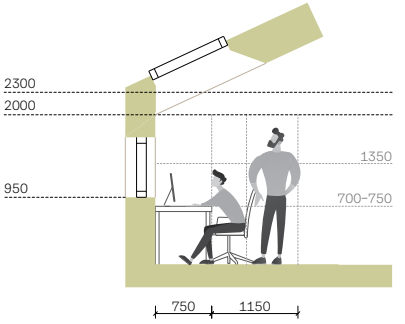


extension of usable space increased by depth of lining to roof window / pay attention to the direction of the light falling on the desk

placement of the desk in a space with a low roof pitch



better illumination deep into the room layout / view provided by an additional window

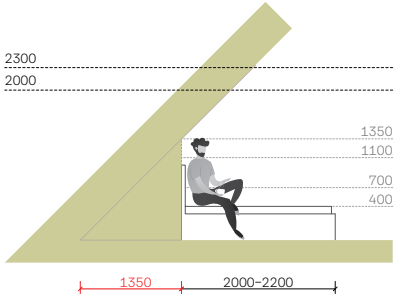


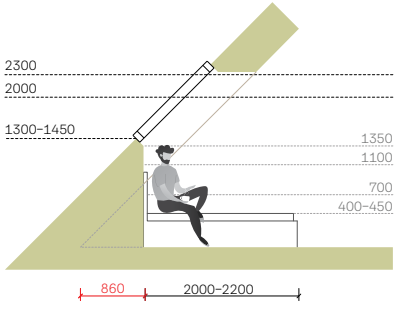
solution of undersizing of facade windows in buildings with low roof pitch / addition of roof lighting

1.4 /Attic ergonomics

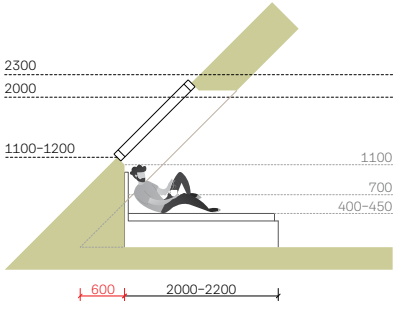
Basic ergonomics for placing furniture under a 45° slope

bed location

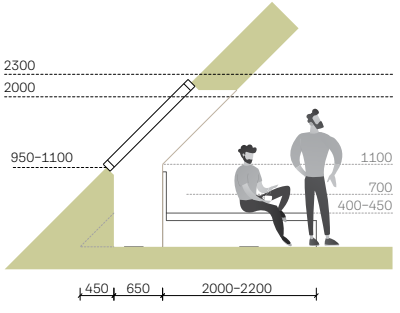




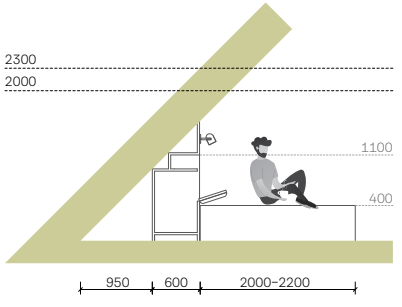
better use of layout / increase of usable area / higher attic knee wall



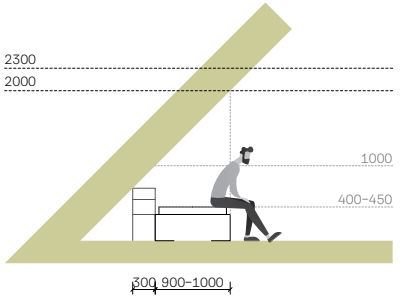
creation of a space with a minimum height for placing the bed under the window



easy access to the bed thanks to the roof windows in recess / low attic knee wall / optimal view



use the inclined wall behind the bed for placement of the furniture

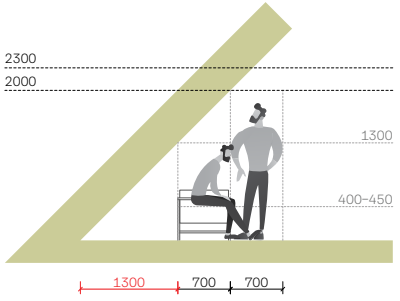


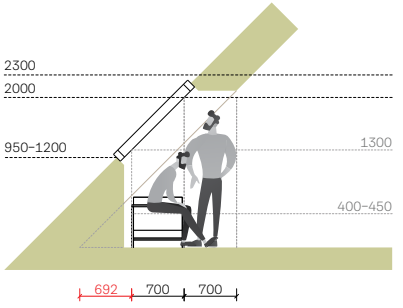
placement of the furniture by the bed parallel to the inclined wall

1.4 /Attic ergonomics

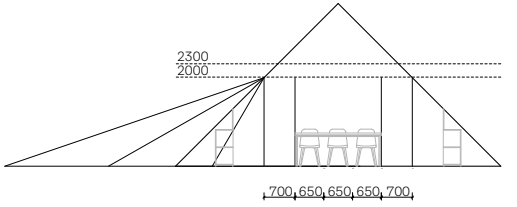
Basic ergonomics for placing furniture under a 45° slope

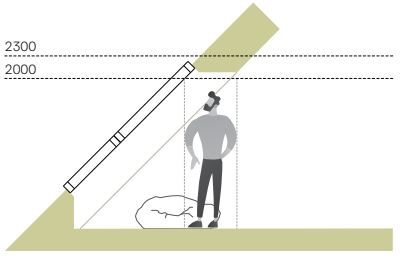
seating location



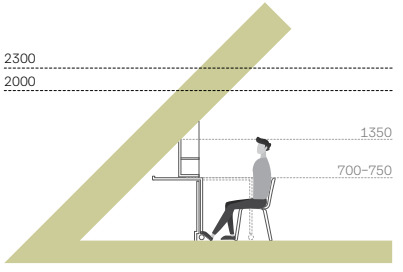


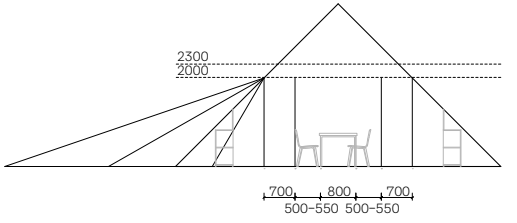
increase the headroom by the depth of the lining





knee wall pushed back to allow lower level fixed windows / glazing to the ground as an attractive element of a modern interior

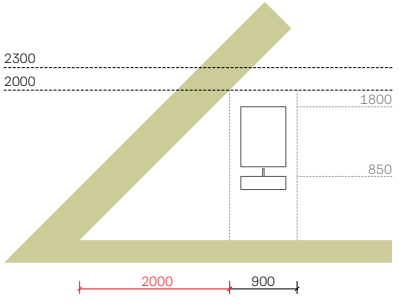


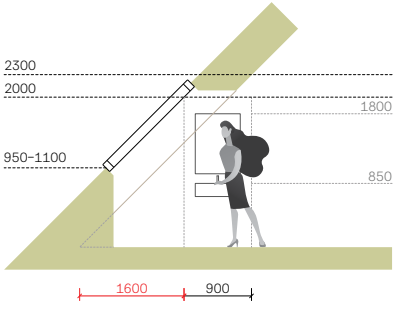


1.4 /Attic ergonomics

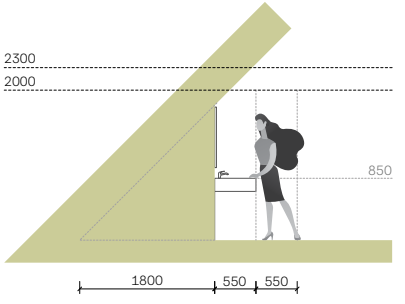
Basic ergonomics for placing furniture under a 45° slope

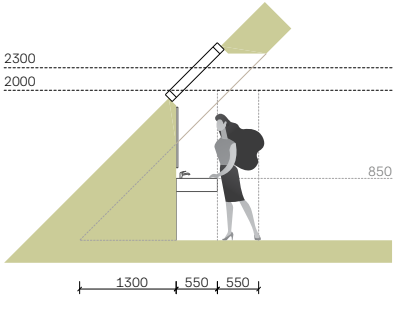
basin location



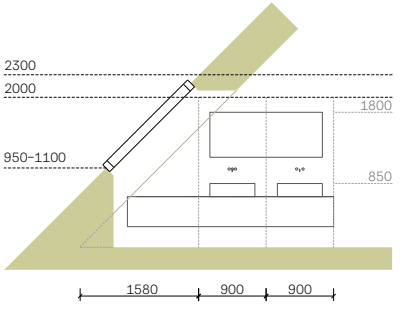


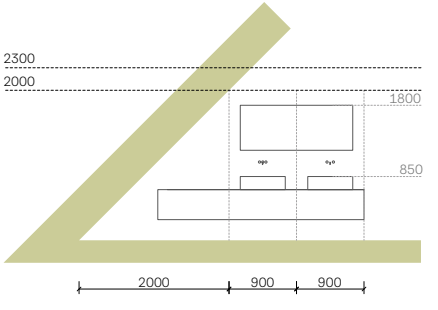
more space / natural light near the mirror





more space / natural light near the mirror

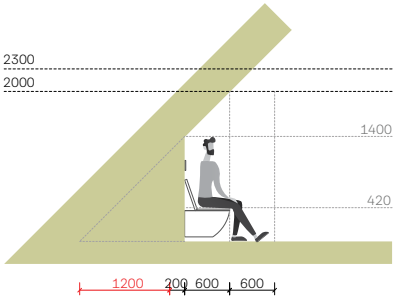


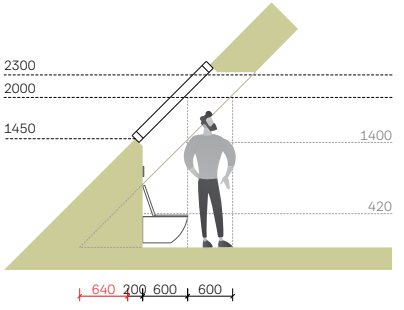


1.4 /Attic ergonomics

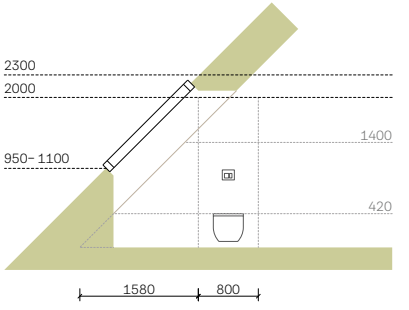
Basic ergonomics for placing furniture under a 45° slope

toilet location

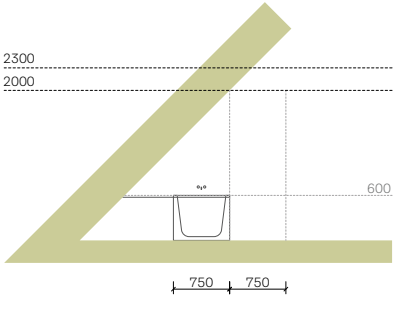


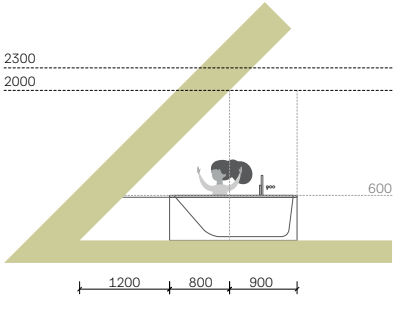


higher headroom / ventilation / lighting

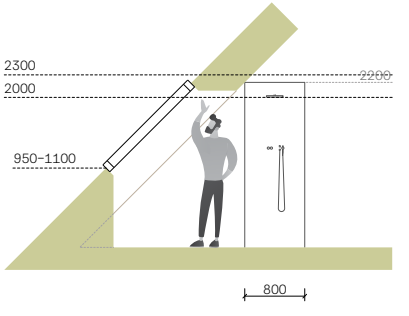


bath/shower location





shower location

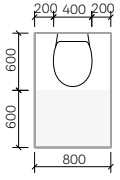


1.4 /Attic ergonomics

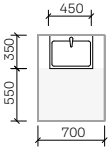
Clear access recommendations

bathroom

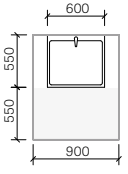
toilet



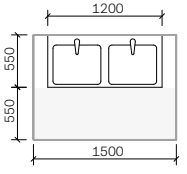
small washbasin



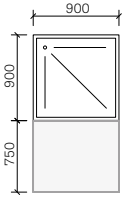
washbasin



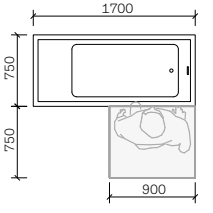
double washbasin



shower

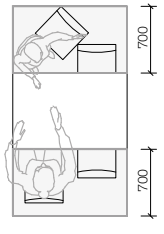


bath

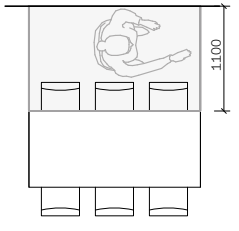


kitchen, dining room

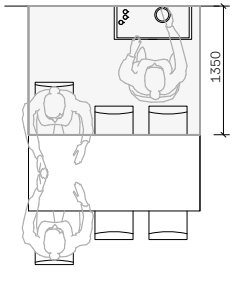
space for moving the chair



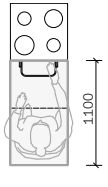
space from a fixed obstacle



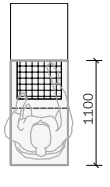
space from the handling obstacle



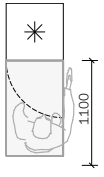
classic oven



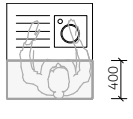
dishwasher



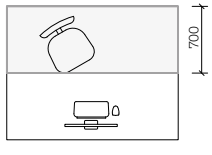
fridge

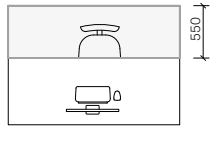


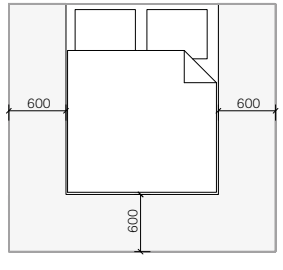
kitchen sink



study/bedroom



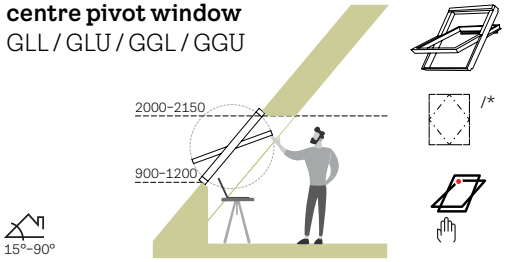




1.5 /Roof windows

Types, methods of control

centre pivot window
GLL / GLU / GGL / GGU

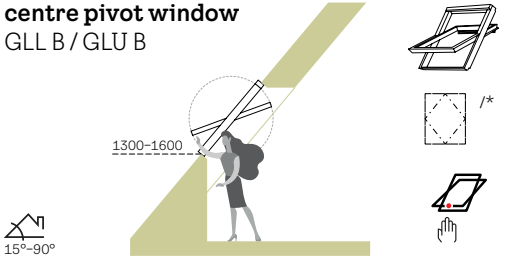


Top operated window

standard attic knee wall / recommended when placing furniture under a window.

*/ display in floor plan

centre pivot window
GLL B / GLU B

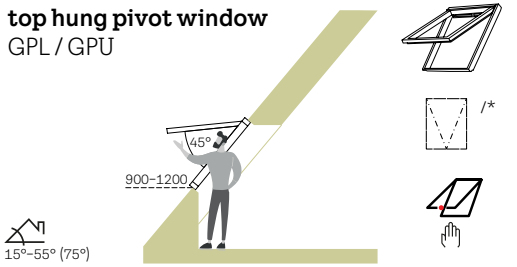


Bottom operated window

high attic knee wall

View lines are limited to the sky when in a seated position. For rooms where a view out is important (living/bedroom), use this as additional lighting.

top hung pivot window
GPL / GPU

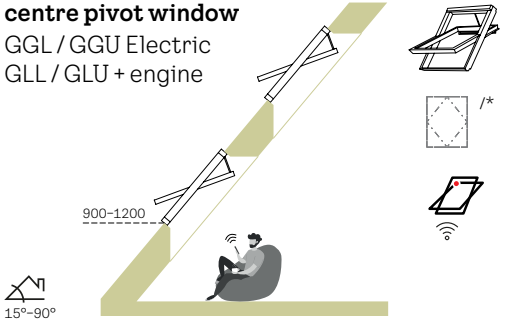


Bottom operated window

standard attic knee wall / panoramic view / possibility to tilt above the roof plane / pivot function for ease of washing the window pane / not optimal for furniture placement under the window

Daylight is irreplaceable. No artificial light source has the same spectrum or changes in colour thoughout the day. This greatly impacts our well-being – we all thrive best in daylight.

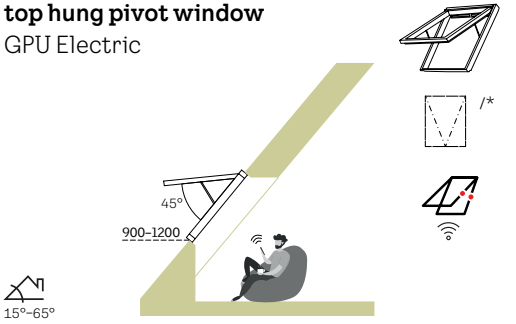
centre pivot window
GGL / GGU Electric
GLL / GLU + engine



Electric or solar powered remote control

not only for windows out of range / comfortable remote control / rain sensor / compatible with VELUX active to monitor and automatically optimise indoor climate

top hung pivot window
GPU Electric



Remote controlled electric powered window

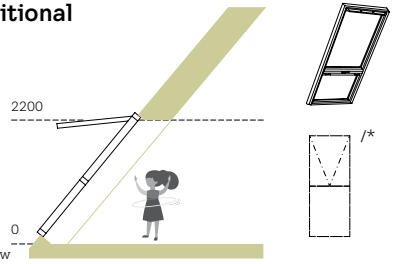
panoramic view / comfortable remote control / rain sensor / compatible with VELUX active to monitor and automatically optimise indoor climate

Photographer: Jaroslav Hejzlar
Architect: Radek Sládeček

1.5 /Roof windows

Types, methods of control

fixed additional element
GIL / GIU

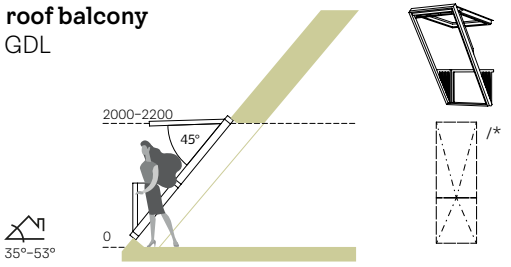


Non-opening, window sill function

install only in combination with roof window above / laminated glass

*/ display in floor plan

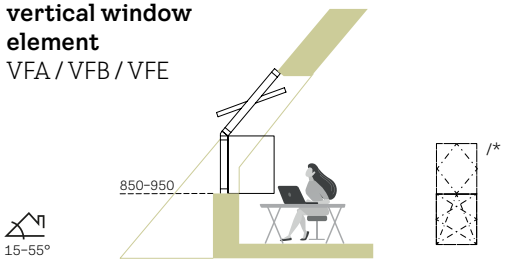
roof balcony
GDL



Balcony created by opening both parts of the window

the upper part operated by lower handle / lower part tilted by handles / side sliding railing with safety device against closing / laminated glass

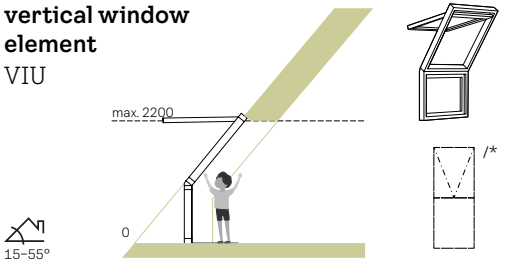
vertical window element
VFA / VFB / VFE



Openable vertical additional window

view from the facade window / Install only in combination with roof window above / well suited to attic spaces with a high parapet wall / VFA – right hinged (seen from outside) / VFB – left hinged (seen from outside) / VFE – bottom hung window / laminated glass

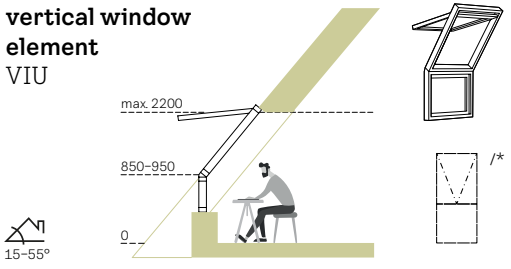
vertical window element
VIU



Non-opening vertical additional window

view from the roof window / Install only in combination with roof window above / window sill function / well suited to attic spaces with a high parapet wall / laminated glass

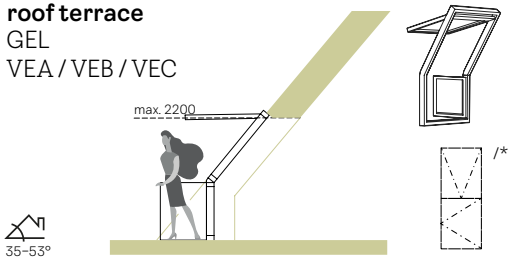
vertical window element
VIU



Non-opening vertical additional window

view from the additional window / Install only in combination with roof window above / well suited to attic spaces with a high parapet wall / laminated glass

roof terrace
GEL
VEA / VEB / VEC



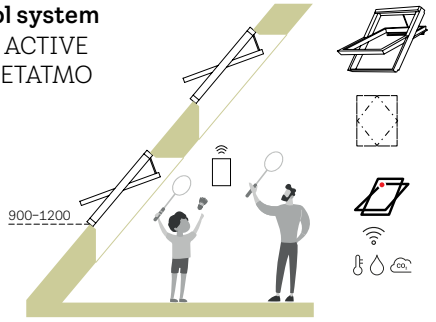
Creates full height access to roof terrace

top hung window gives full head height access to roof terrace/ panoramic views / lower opening or non-opening window / right and left opening / when installed side by side only one vertical element can be openable

1.5 /Roof windows

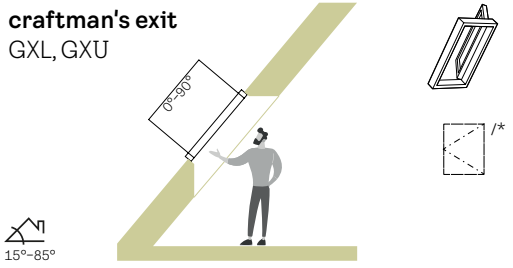
Types, methods of control

control system
VELUX ACTIVE
with NETATMO



Automatic control of the VELUX ACTIVE indoor environment sensors monitor humidity, temperature & CO_2 levels and automatically control window operation, shading devices to ensure optimal indoor climate / smart home / for electrically and solar powered windows and blinds

craftman's exit
GXL, GXU

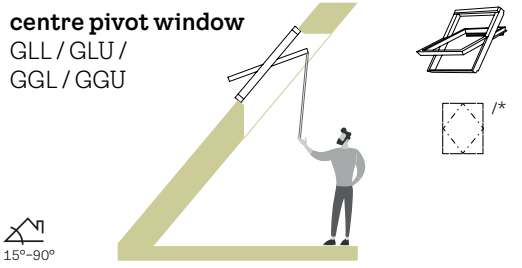


Openable with side hinges

for insulated roof / fixing of the open section

*/ display in floor plan

centre pivot window
GLL / GLU /
GGL / GGU

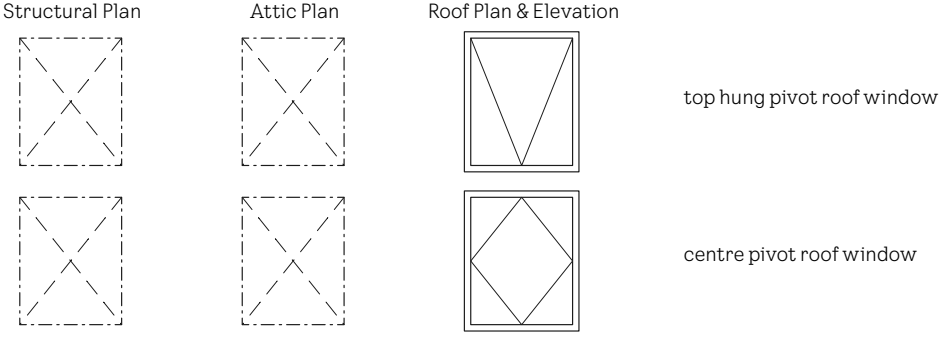


centre pivot roof windows installed in high, out of reach positions can be manually controlled with a pole

Drawings of the construction part

Rules for representation – Lines in construction drawings (Needs to be checked for each country)

Roof windows in floor plan



02/ Rooms in the attic

Rooms in the attic

2.1 Living room

2.2 Kitchen

2.3 Children‘s rooms

2.4 Bedroom

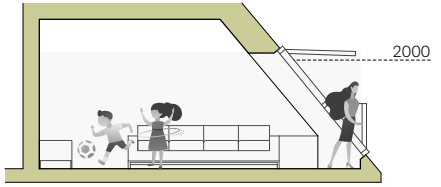
2.5 Bathroom, toilet

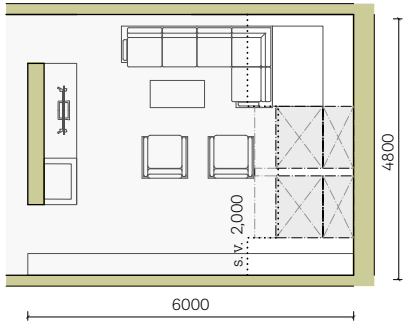
2.6 Study /
work position

2.1 /Living room

Lighting recommendation is 500 LUX.

living room with roof balcony





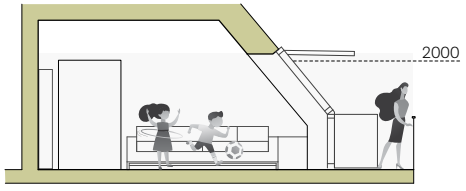
the roof balcony will improve the use of room space / attractive views

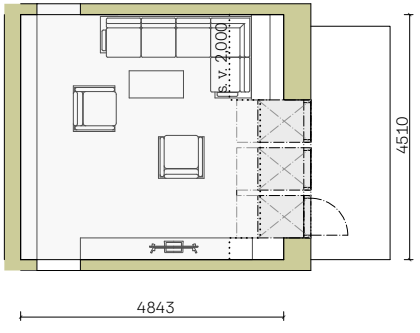

Visualization made in cooperation with the VELUX Group

2.1 /Living room

Lighting recommendation is 500 LUX.

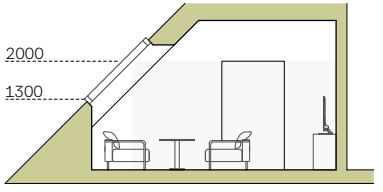
living room with access to a roof terrace

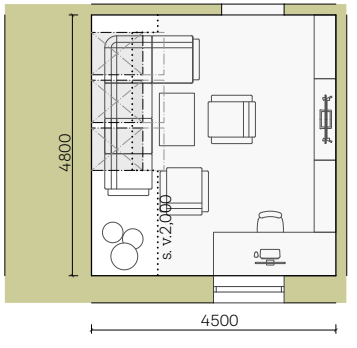




comfortable lighting with access to the terrace / modern loft solution / full glazing optically enlarges the room

economical living room





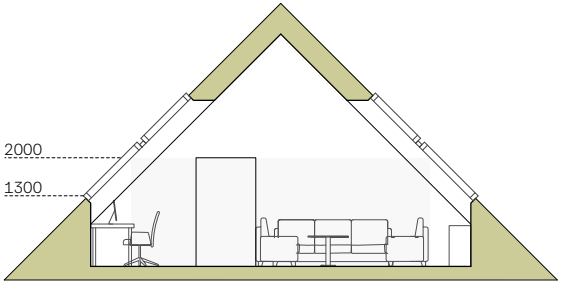
sitting under the roof window / increase in the headroom

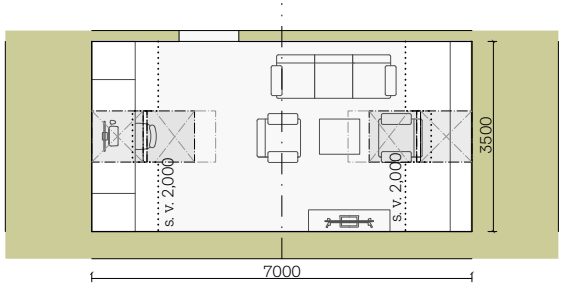
Plenty of daylight and the view optically enlarge each space. It creates a great visual impression, improves mood, reduces the feeling of fatigue and prolongs the day.

2.1 /Living room

Lighting recommendation is 500 LUX.

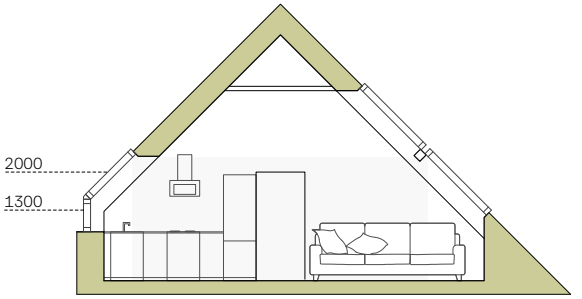
living room with work area

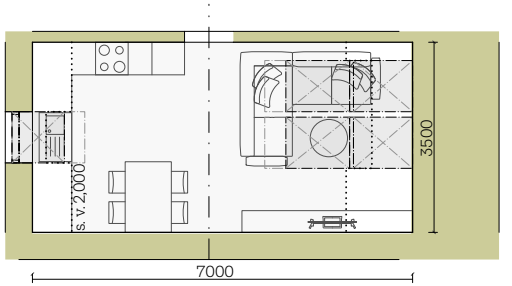




space open to the truss / narrow layout / lighting of the entire depth of the room

living area with kitchen and dining area





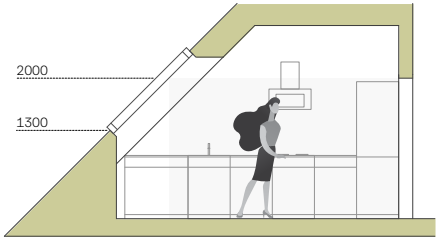
economical layout / combination of inclined walls with vertical windows in the kitchen / combination of windows in the living area optically enlarges the space

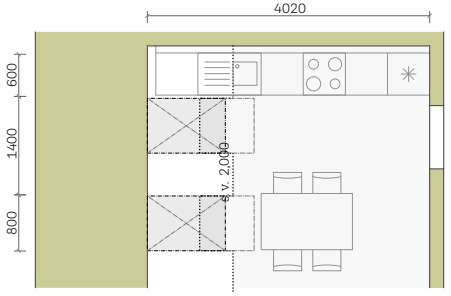

Visualization made in cooperation with the VELUX Group | VELUX

2.2 /Kitchen

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

small single row kitchen

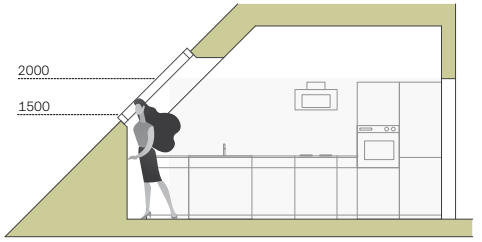


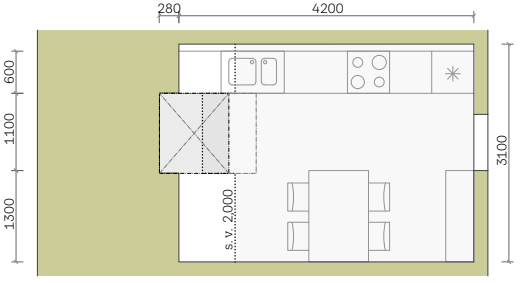


this location provides lighting for the work area as well as a view

single row kitchen

with high attic knee wall





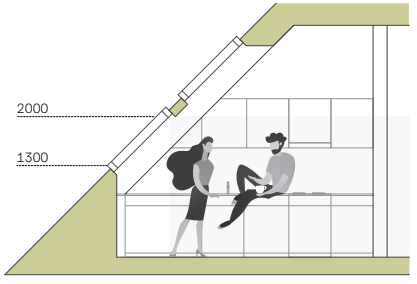
the roof window extends the usable space with the required height

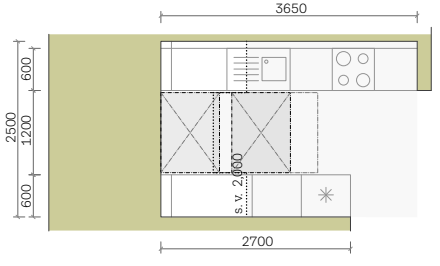
The kitchen is the busiest work area in the household. Targeted lighting of the work surface brings maximum comfort when preparing food.

2.2 /Kitchen

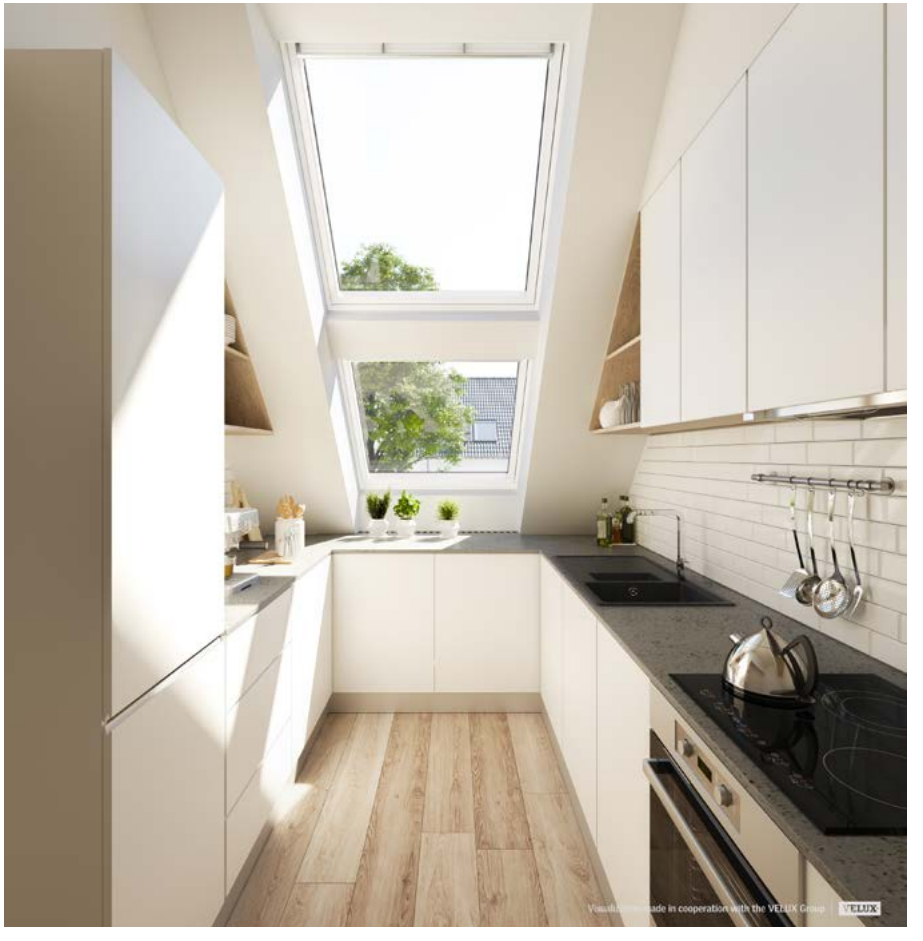
The lighting recommendation for food preparation is 500 LUX, for dining 300 LUX is recommended.

double row kitchen





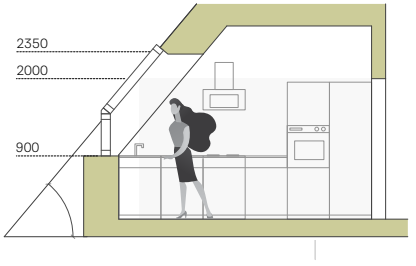
roof windows illuminate both work surfaces / windows above each other look great both from the interior and the exterior and bring light deep into the floor plan

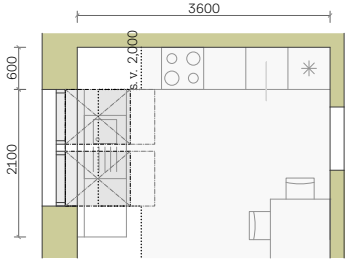


2.2 /Kitchen

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

L-shaped kitchen



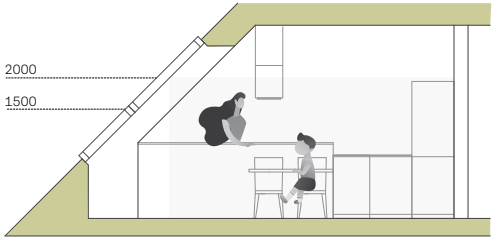


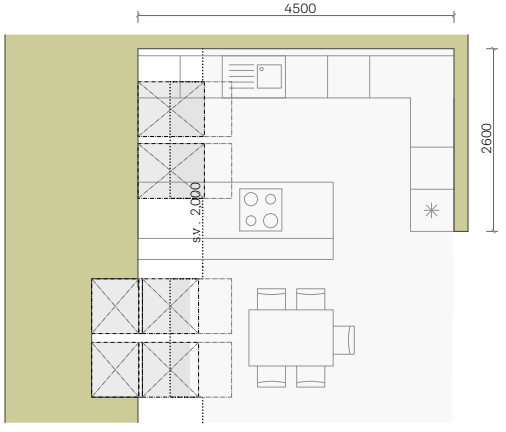
the view from the attic with a high attic parapet is provided by a combination of a roof and a vertical window

2.2 /Kitchen

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

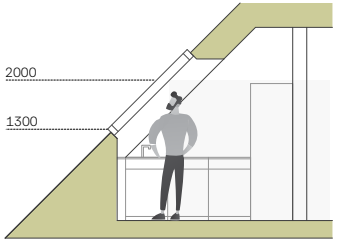
L-shaped kitchen with an island

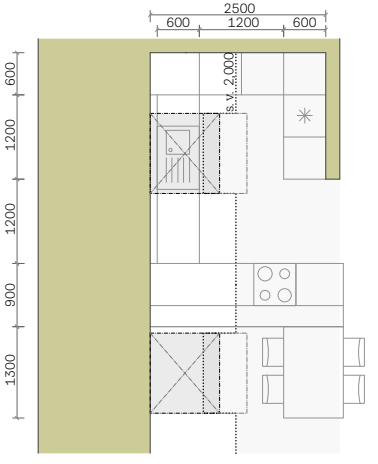




the set of roof windows in the dining room will bring a unique experience with the view / placing the windows in the recess will allow us to lower the window sill for view whilst seated

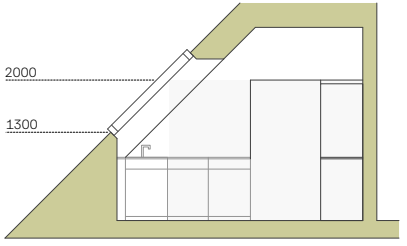
G-shaped kitchen

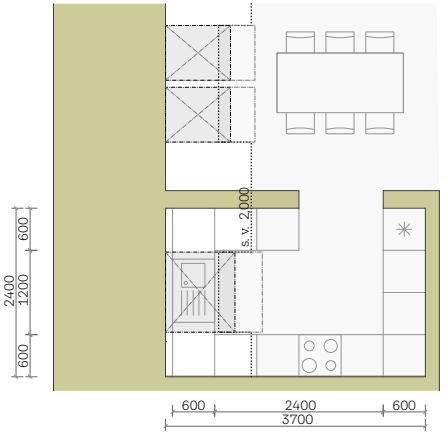




the sunroof will extend the useable space in the kitchen / a wider roof window will bring more daylight and space

G-shaped kitchen





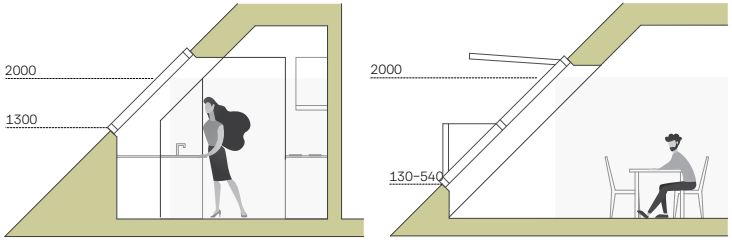
the optimal placement of tall cabinets is outside the inclined wall

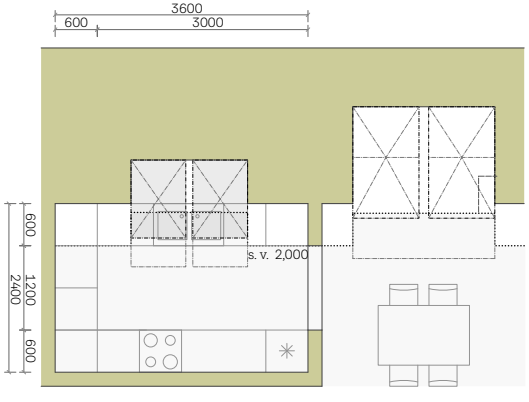
2.2 /Kitchen

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

U-shaped kitchen

with high attic knee wall / dining room with roof balcony





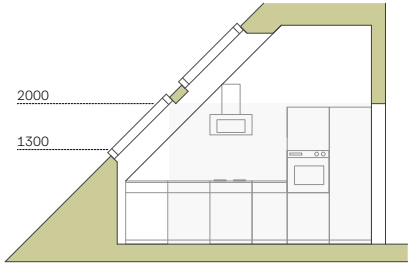
the height of the attic knee wall can be chosen according to the needs of the room / dining room is a suitable space to place larger glazing

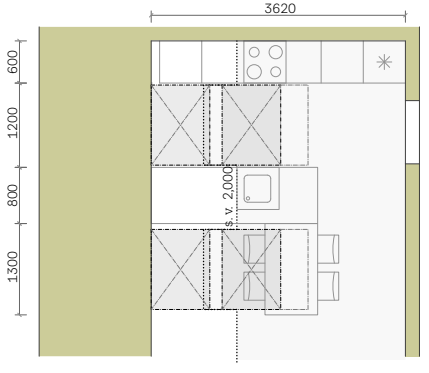
The lighting quality
of an interior
has a major impact
on the value
of the property.

2.2 /Kitchen

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

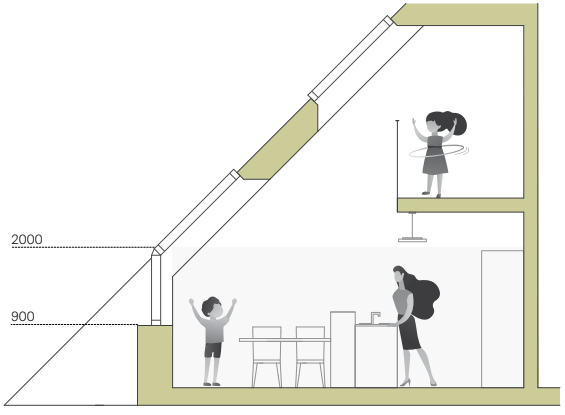
single row kitchen with an island

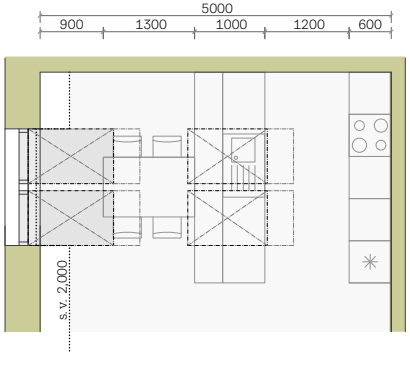




attic space should be large / larger volume of air / slower overheating / interesting design of windows on top of each other

Top lighting is the best solution in the kitchen. The high temperatures used in the preparation of food accelerate the chimney effect and natural ventilation through high windows is very effective.



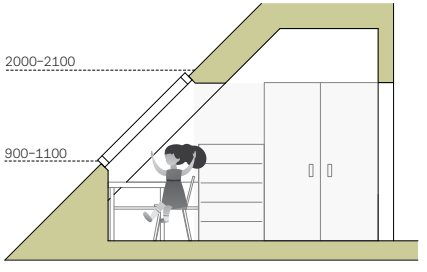


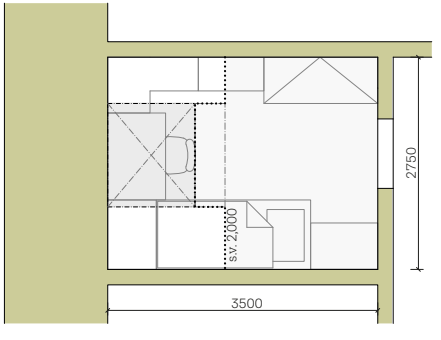
the best attic spaces open over two floors / attractive space / even lighting and deeper lines / faster ventilation

2.3 /Children‘s rooms

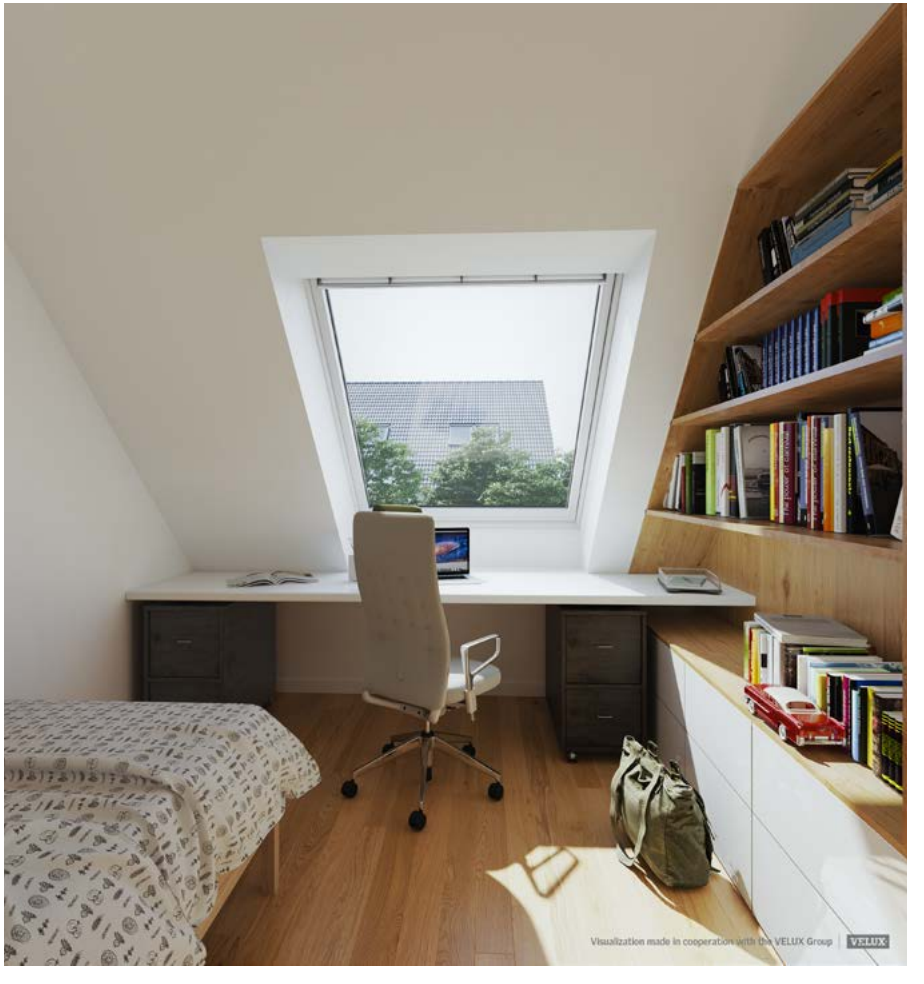
The lighting recommendation for reading and writing is 500 LUX

children‘s rooms for one child





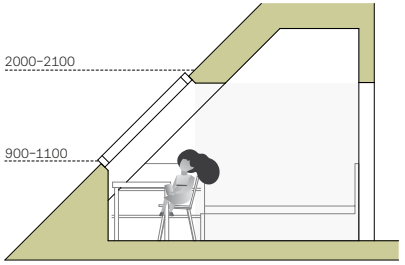
we place higher storage spaces outside the inclined wall / use of standard furniture

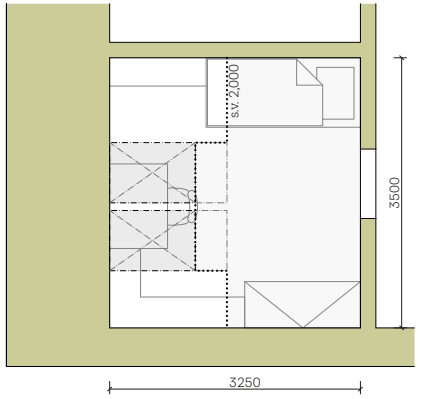


2.3 /Children‘s rooms

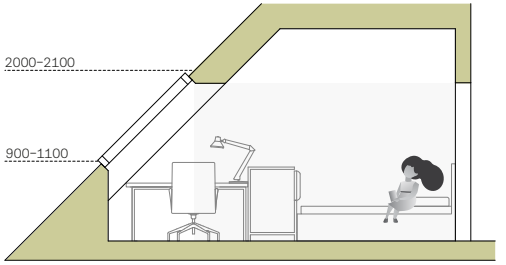
The lighting recommendation for reading and writing is 500 LUX

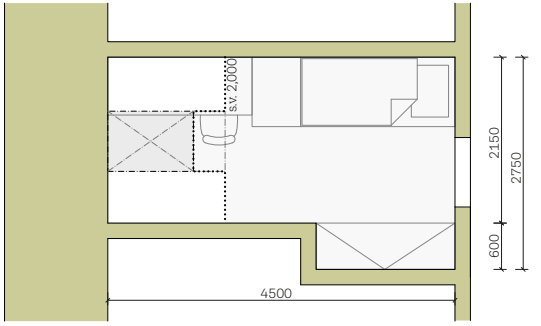
children‘s rooms for one child



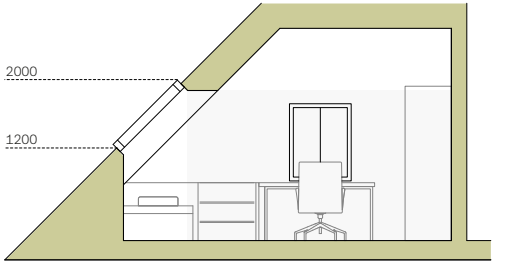


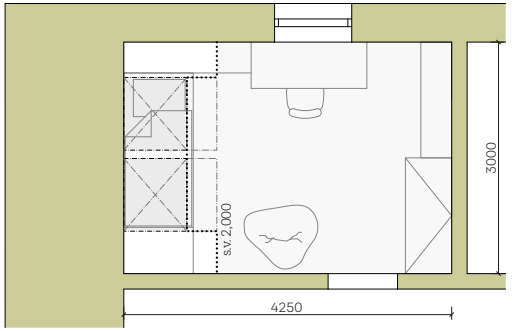
placement of the desk under the window which allows optimal lighting of the worktop / good view even while sitting





recess for wardrobes is a popular feature in today‘s homes



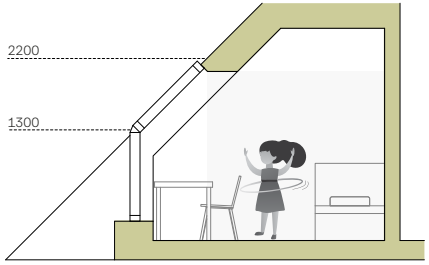


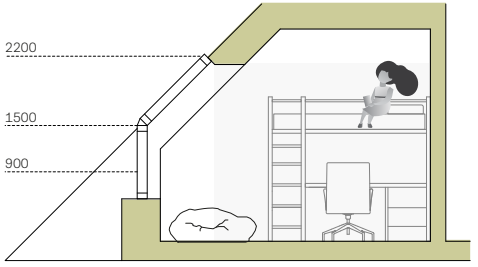

NEW
YORK

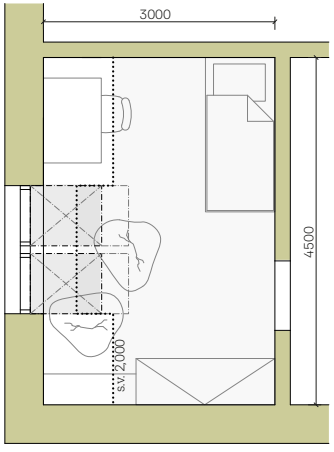
2.3 /Children‘s rooms

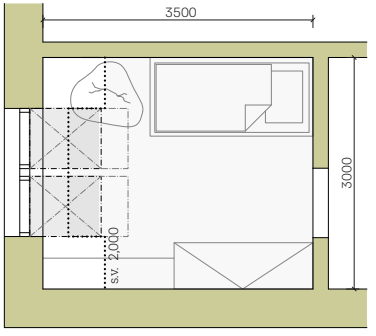
The lighting recommendation for reading and writing is 500 LUX

children‘s room for one child







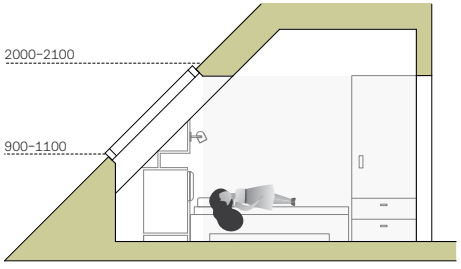


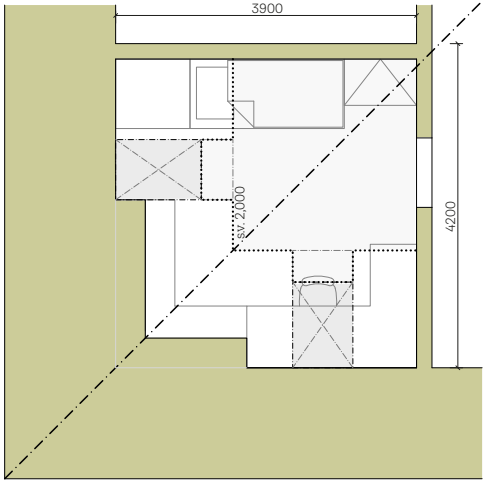
The children‘s room is used for work, study, play and sleep. The right intensity and distribution of natural daylight improves sleep and the ability to learn.

2.3 /Children‘s rooms

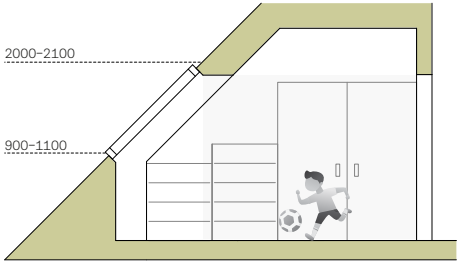
The lighting recommendation for reading and writing is 500 LUX

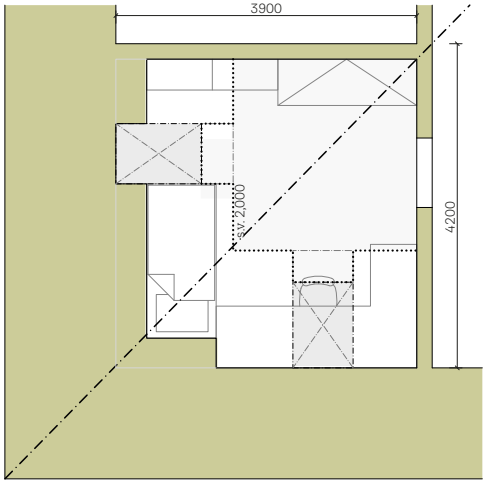
children‘s room for one child





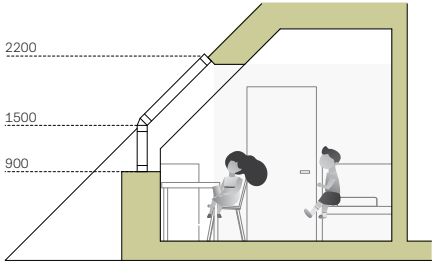
placement of roof windows in opposite parts of the roofs / even lighting / effective ventilation / changing height of the attic knee wall according to the function / integrated storage system effectively uses the space under the inclined wall

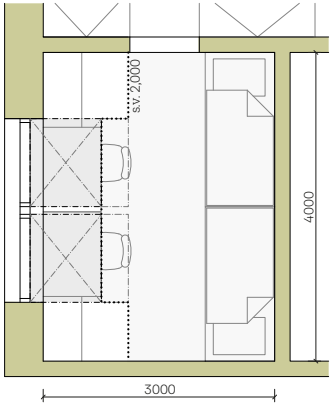




placement of windows in opposite parts of the roofs / even illumination / effective ventilation / changing height of the attic knee wall according to function / wardrobes are located in the highest part of the room

children‘s room for two children



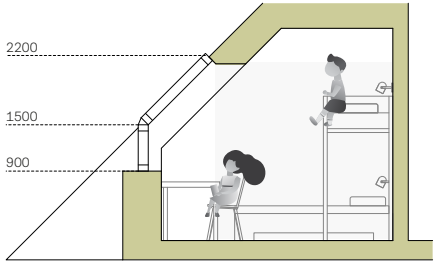


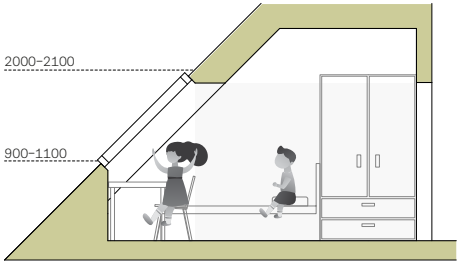
2.3 /Children‘s rooms

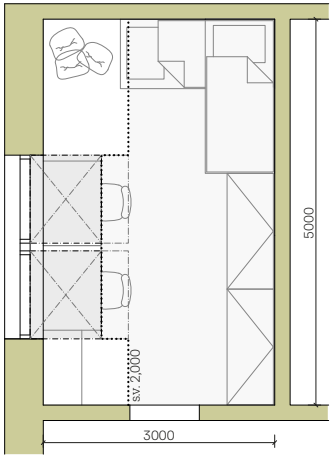
The lighting recommendation for reading and writing is 500 LUX

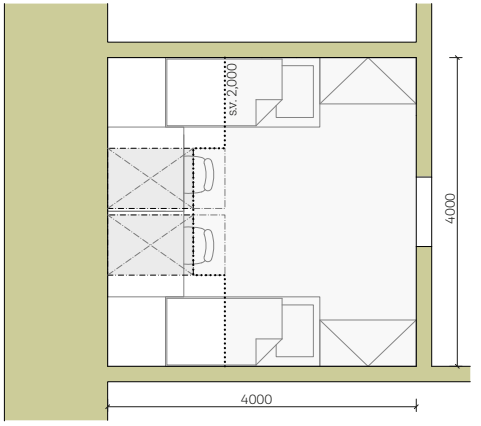
Studies show that concentration and the ability to learn can be increased by up to 15% with better light quality. In the early evening, natural daylight reduces the feeling of fatigue and prolongs the day.

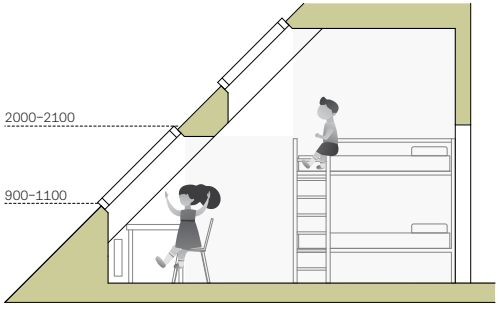
children‘s room for two children

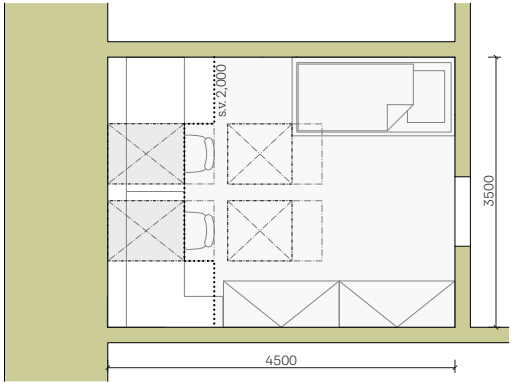










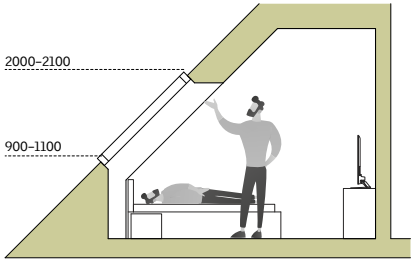


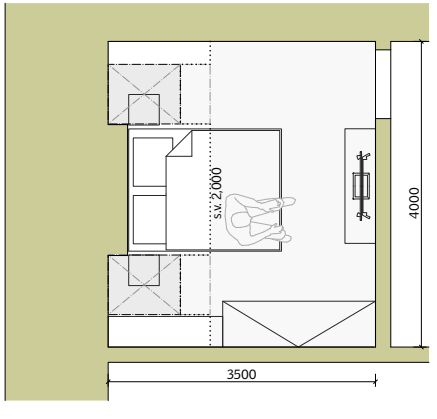
the attic open to the truss will allow better use of the beds above each other / larger air volume / better lighting / better use of space on a smaller floor area

2.4 /Bedroom

Lighting recommendation is 500 LUX.

small attic bedroom





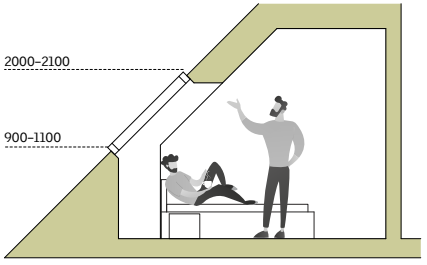
placement of the bed between the windows / low headboard / optimal view / increased head height and easier access to the bed thanks to the placement of windows next to the bed

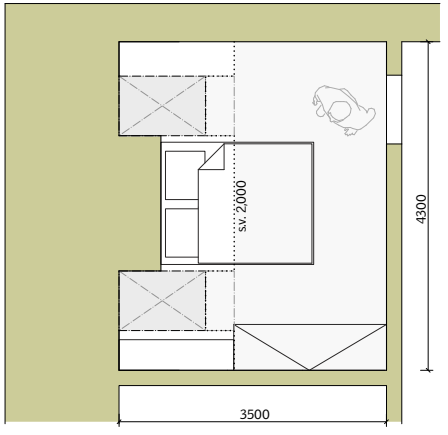
2.4 /Bedroom

Lighting recommendation is 500 LUX.

small attic bedroom

with attic knee wall and recess for the roof window

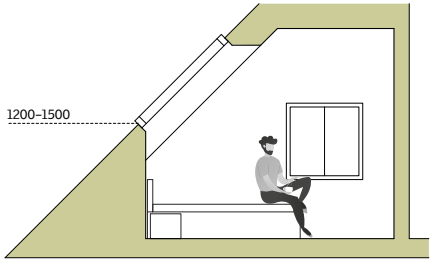


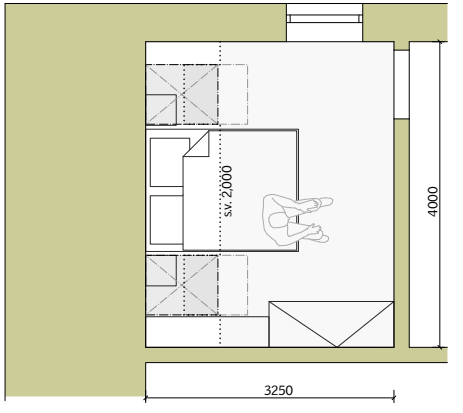


placing the bed between the windows / wall behind the bed will allow you to leave the windows in the optimal position and use the high headboard

small attic bedroom

with high attic knee wall





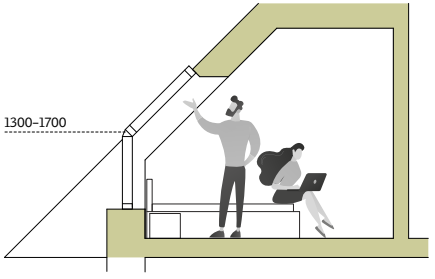
placement of the bed between the windows / with a high knee wall the optimal view is ensured by the facade window

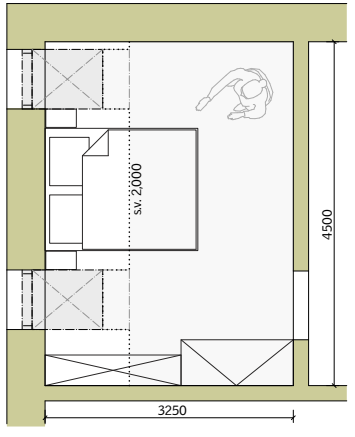
Plenty of daylight and contact with the outside environment visually enlarges each room.

2.4 /Bedroom

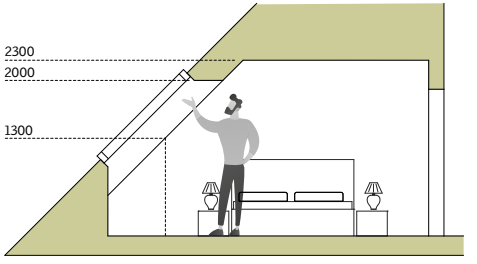
Lighting recommendation is 500 LUX.

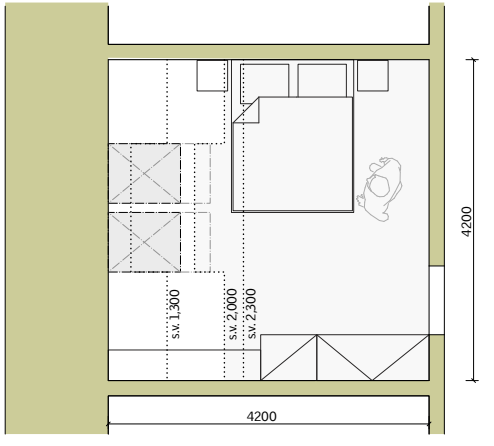
small bedroom



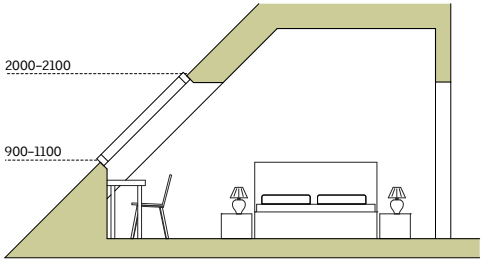


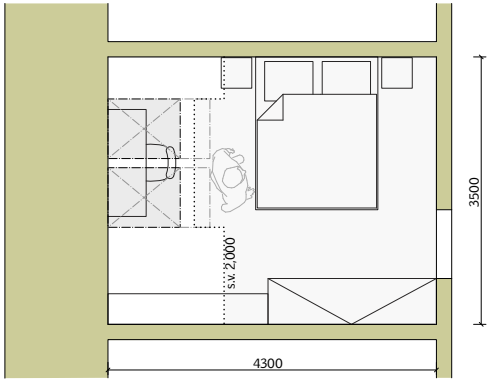
placement of the bed between the windows / use of a combination of roof and vertical window element





placement of the bed by the wall / minimum dimensions / full head clearance only from one side of the bed





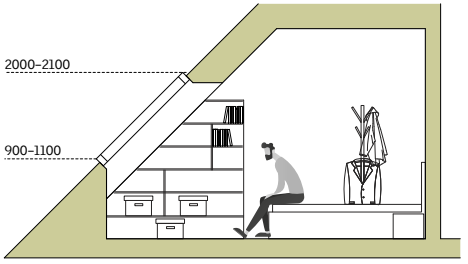
placement of the bed by the wall / minimum access to the bed from both sides

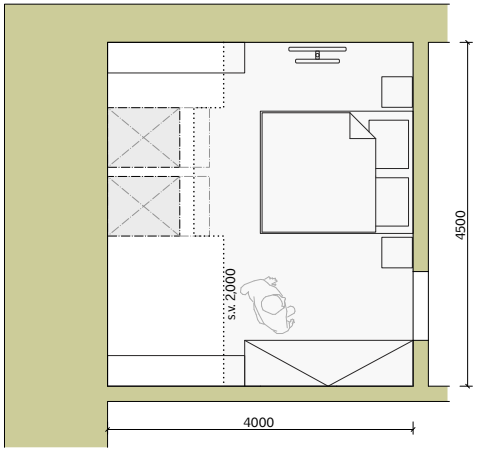
2.4 /Bedroom

Lighting recommendation is 500 LUX.

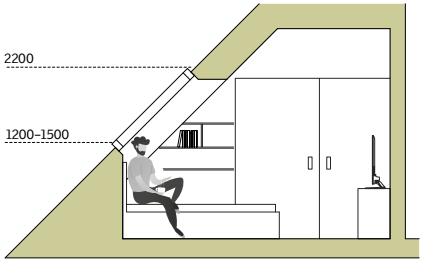
We need the right light at the right intensity at the right time. We may underestimate the lighting of the bedroom, however, it affects our 24-hour biological cycle.

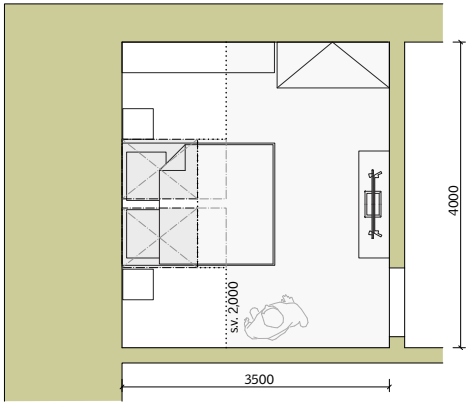
bedroom with a view





location of the bed opposite the windows / optimal view from the bed / effect on the size of the room



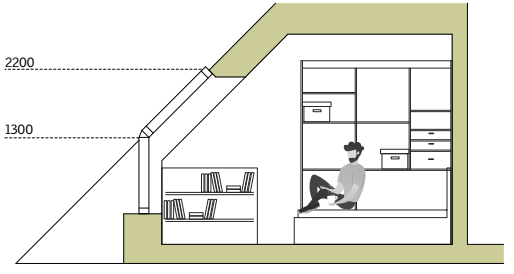


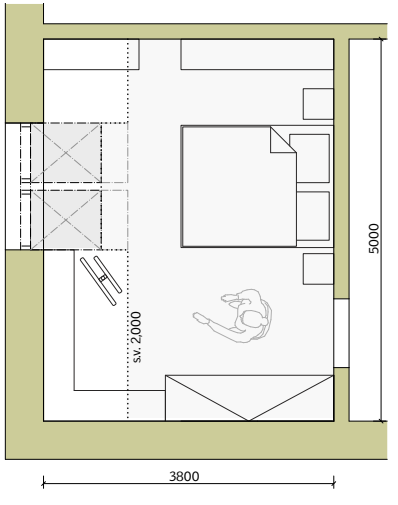
bed located under the windows / economy version layout / star view

2.4 /Bedroom

Lighting recommendation is 500 LUX.

bedroom with a view

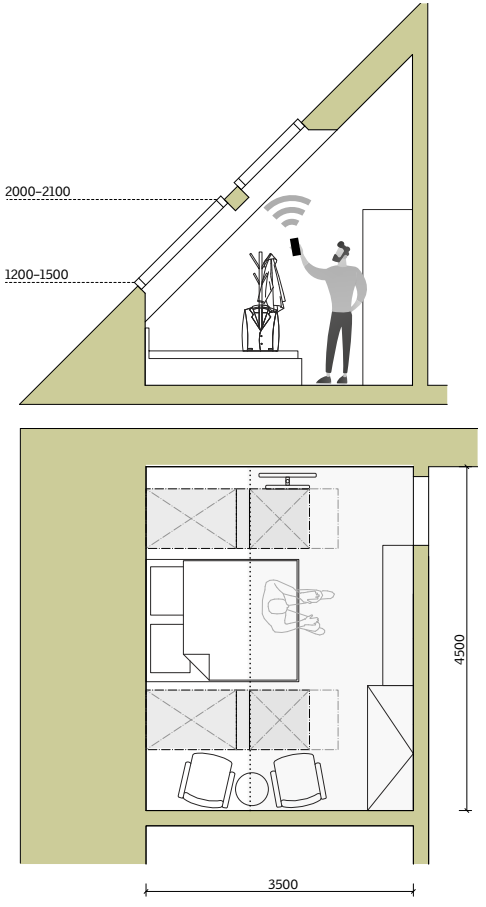




angled glazing for the best view

2.4 /Bedroom

Lighting recommendation is 500 LUX.

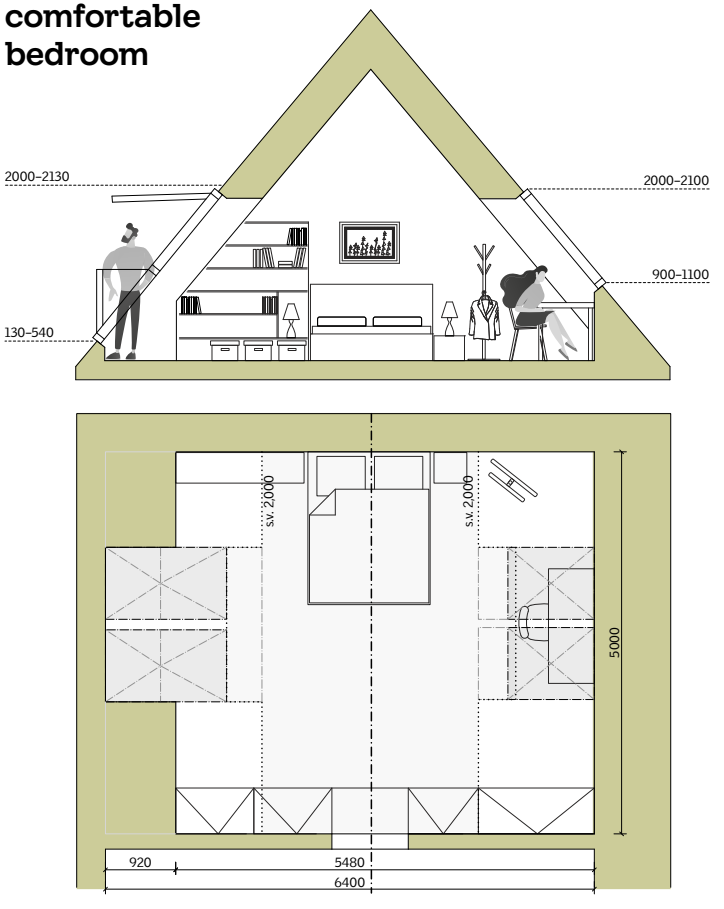


optical enlargement of the space by opening into the truss /
larger volume of air / ventilation through the chimney effect

2.4 /Bedroom

Lighting recommendation is 500 LUX.

It is assumed that healthy light is very closely related to healthy darkness, which basically means we need high light intensity during the day and a darkened room while sleeping. High light intensity is important for the first 20 minutes in the morning after waking up.



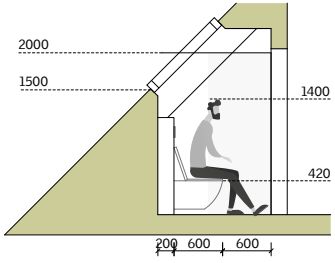
opening into the truss gives the space the opportunity to stand out / connection with the study / the possibility of cross ventilation / comfortable balcony window

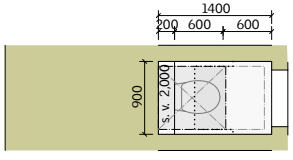

Visualization made in cooperation with the VELUX Group
VELUX

2.5 /Bathroom, toilet

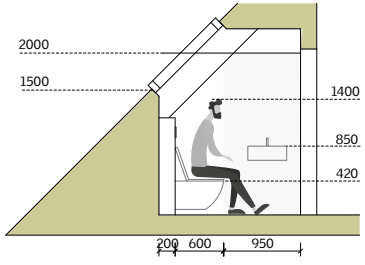
The light intensity of 200 LUX is suitable for showering, washing and changing clothes.

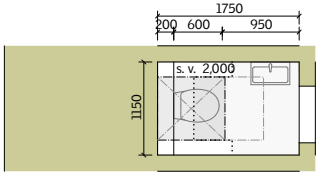
minimum toilet size





toilet with washbasin

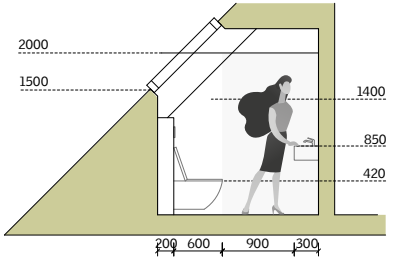


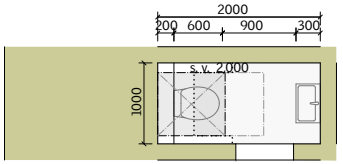


2.5 /Bathroom, toilet

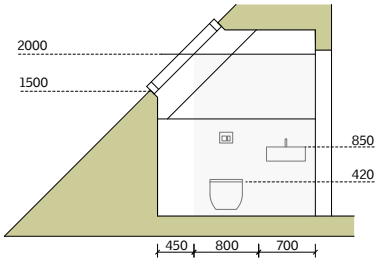
The light intensity of 200 LUX is suitable for showering, washing and changing clothes.

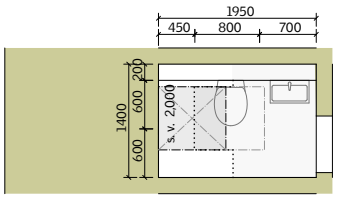
toilet with washbasin and side entrance





toilet with a washbasin



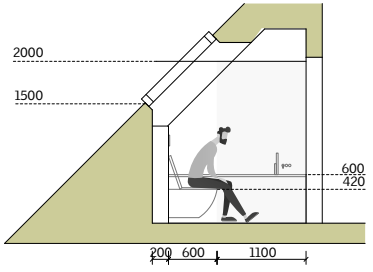


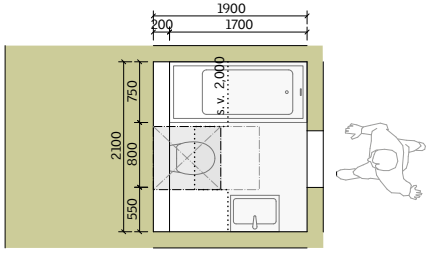
The first 15 to 20 minutes of morning light help to “set” the biological clock of our body, higher intensity will start us up for the whole day.

2.5 /Bathroom, toilet

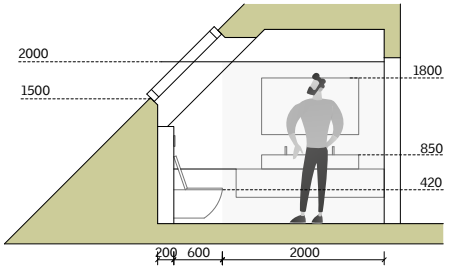
The light intensity of 200 LUX is suitable for showering, washing and changing clothes.

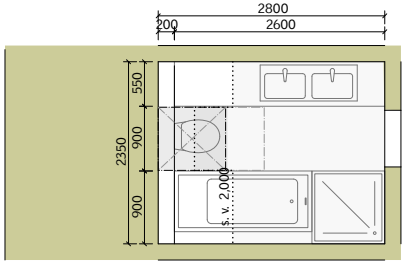
small bathroom with a bath



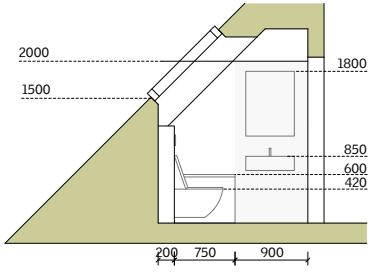


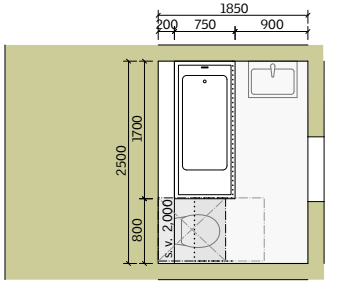
small bathroom with a bath, shower, double washbasin and toilet



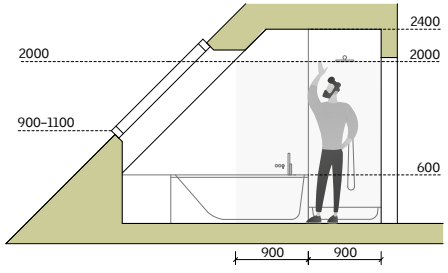


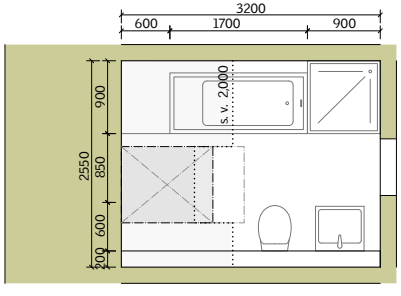
small bathroom with high ceiling





bathroom with low knee wall



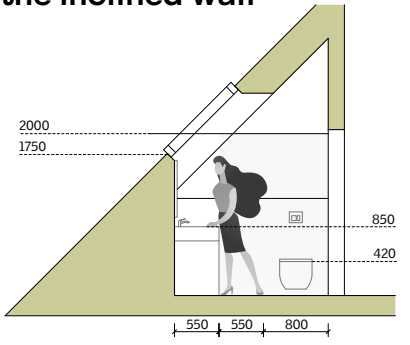


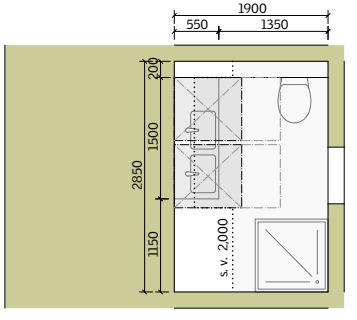
2.5 /Bathroom, toilet

The light intensity of 200 LUX is suitable for showering, washing and changing clothes.

Daylight creates natural colour rendering.
The best make-up is done in daylight.

with washbasin below the inclined wall

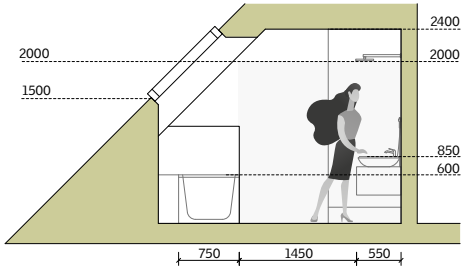


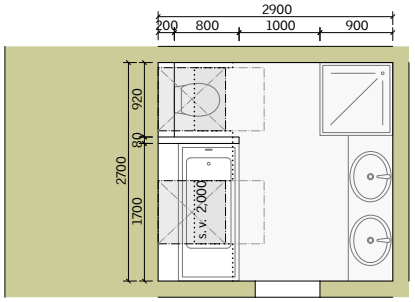


2.5 /Bathroom, toilet

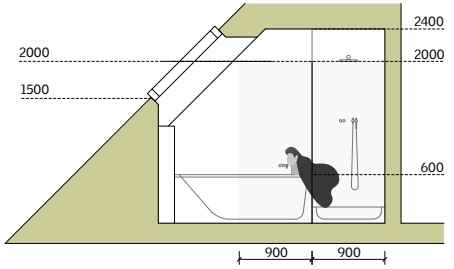
The light intensity of 200 LUX is suitable for showering, washing and changing clothes.

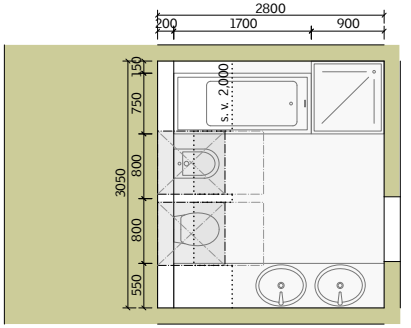
comfortable bathroom with a side entrance



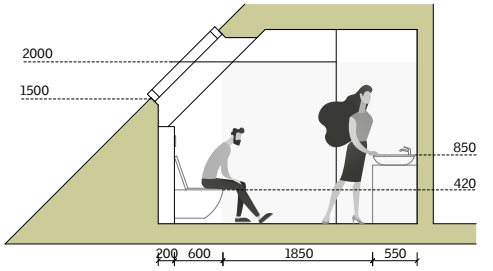


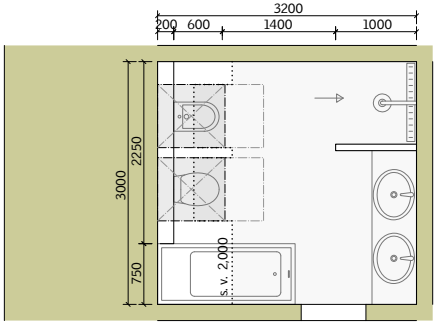
comfortable bathroom with a toilet and bidet





comfortable bathroom with a walk-in shower

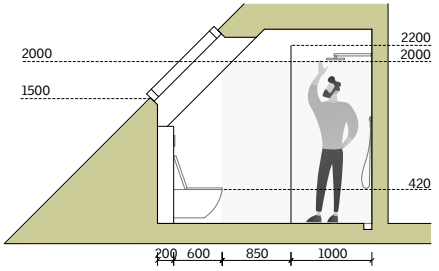


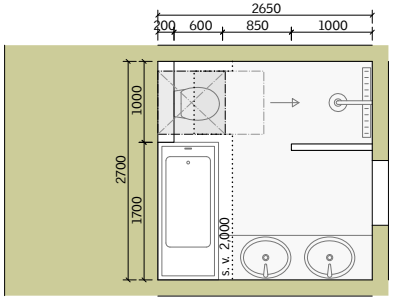


2.5 /Bathroom, toilet

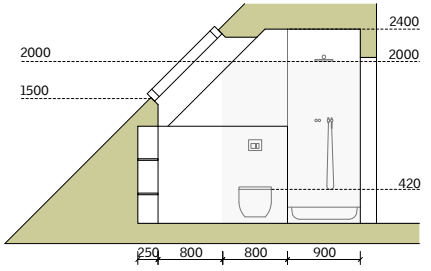
The light intensity of 200 LUX is suitable for showering, washing and changing clothes.

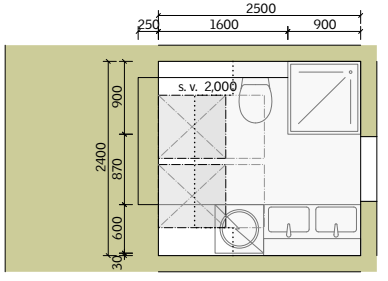
small bathroom with a walk-in shower



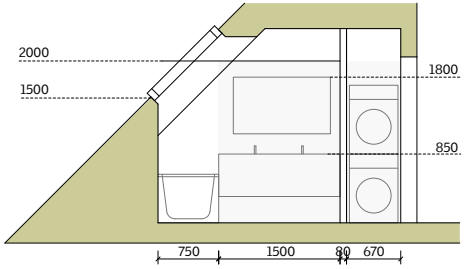


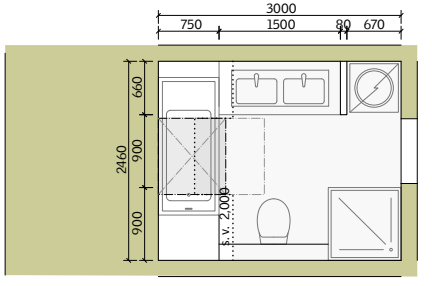
small bathroom with a washing machine





bathroom with a bath under the window



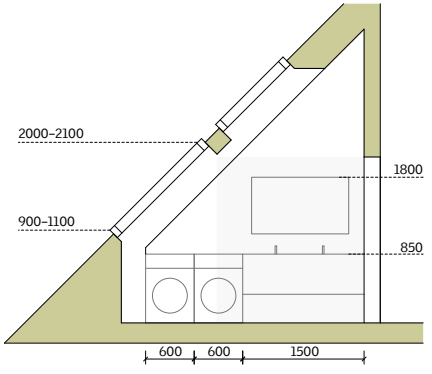


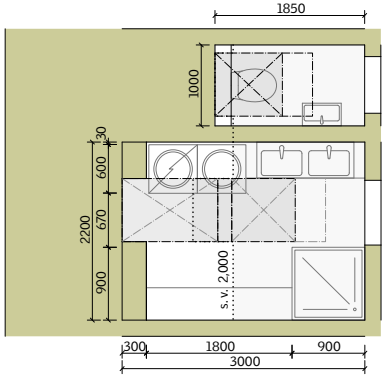
Humidity will be vented as necessary by the automatically operated roof window.

2.5 /Bathroom, toilet

The light intensity of 200 LUX is suitable for showering, washing and changing clothes.

bathroom with a separate toilet, washer and dryer

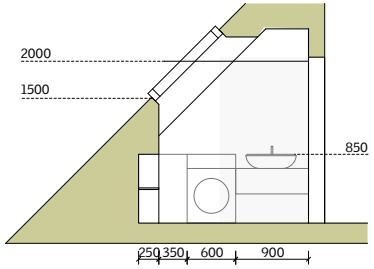


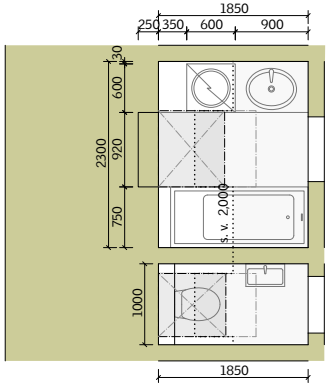


2.5 /Bathroom, toilet

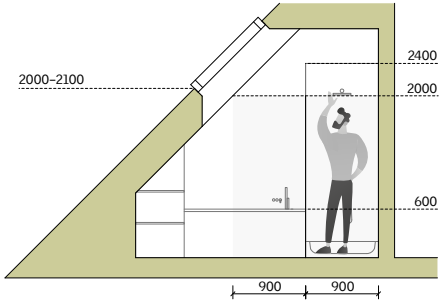
The light intensity of 200 LUX is suitable for showering, washing and changing clothes.

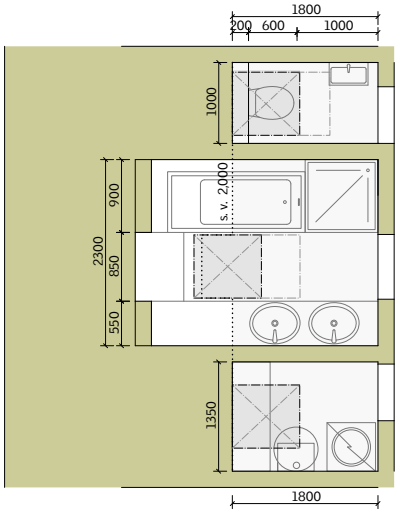
small bathroom with a separate toilet and high attic knee wall



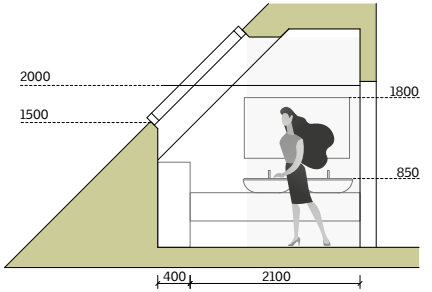


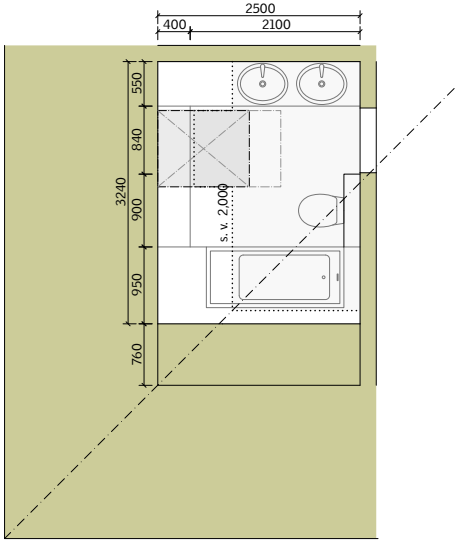
comfortable bathroom with a separate toilet and laundry





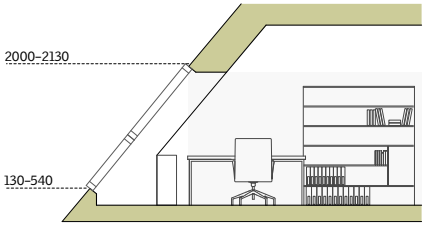
bathroom in the hipped roof

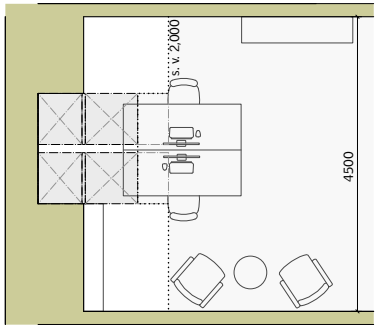




2.6 /Study / work position

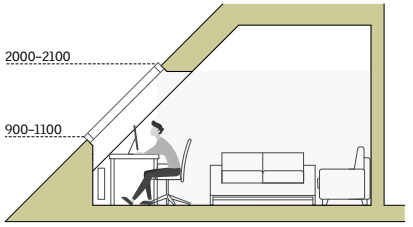
study for two people

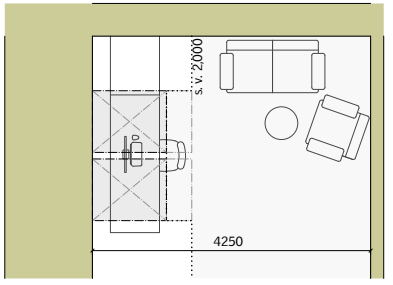




targeted desktop lighting / attractive view

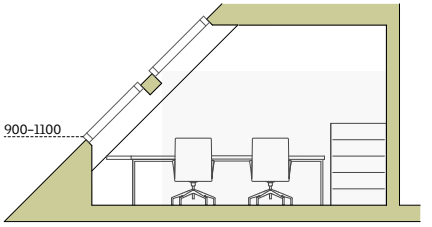
study with a view

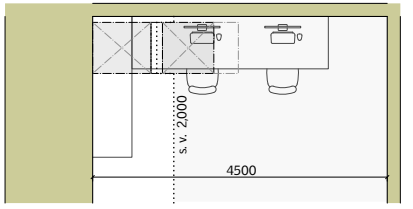




targeted desktop lighting / view / top window control

study for two people





targeted lighting of the desktop / design-attractive organization of places


TRICTLY
PARKING

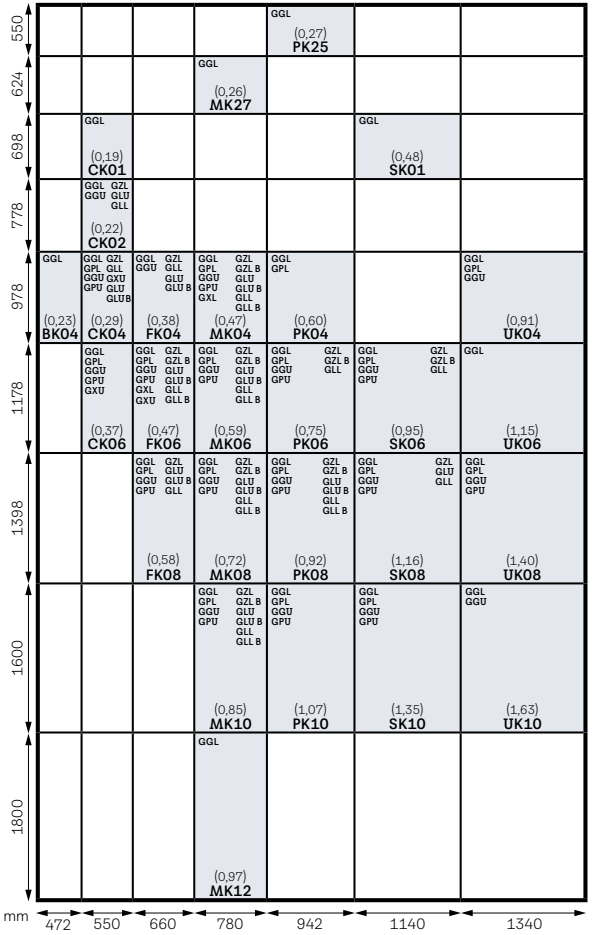
03/ Technical solutions

Technical solutions

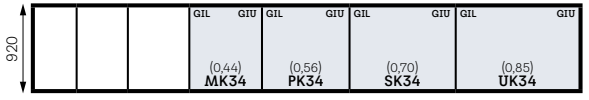
3.1 /Roof windows

Dimension tables

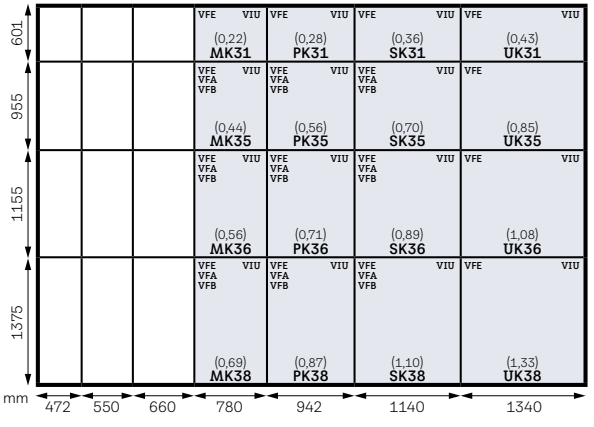
Roof windows



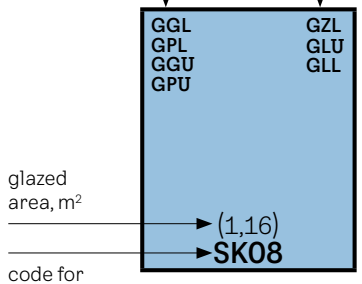
Additional windows



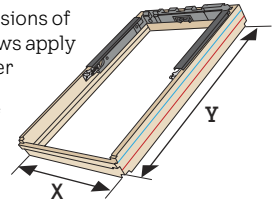
Vertical additional windows



VELUX roof window type

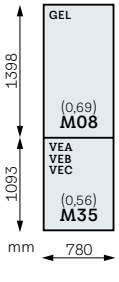


The dimensions of the windows apply to the outer frame of the roof window

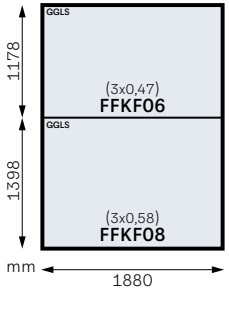


Roof balcony GDL

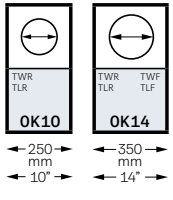
Roof terrace GEL



VELUX GGLS 3 in 1



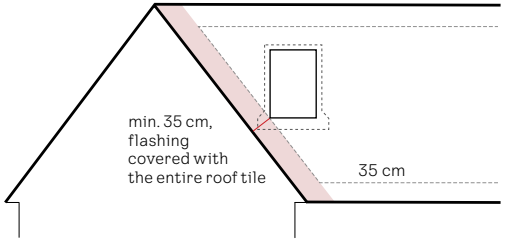
Suntunnels



3.2 /Installation of a window in the roof structure

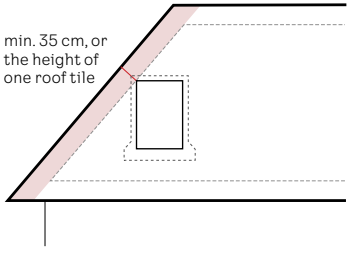
Distances

minimum distances of the roof window from the valley



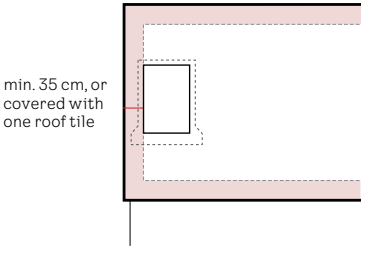
* applies to roof tiles of 30 cm long

minimum distances of the roof window from the hip

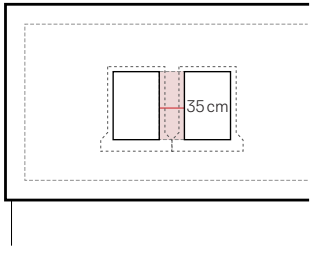


* applies to roof tiles of 30 cm long

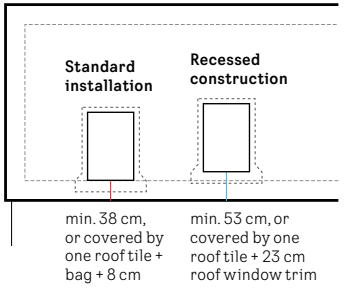
minimum distances of the roof window from the roof edge



minimum distances of two separately installed windows

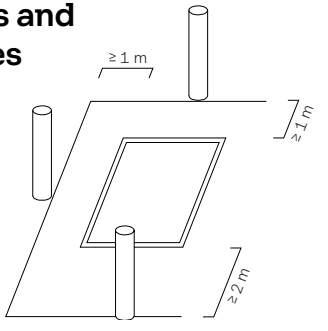


minimum distances of the roof window from the gutter



* applies to roof tiles of 30 cm long

intervals and distances



Chimneys and smoke exhaust pipes – design, implementation and connection of fuel appliances.
The location of roof windows and chimneys is determined by the minimum distances: 1 m from the sides; 2 m under the window; 1 m above the window

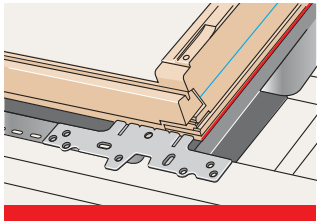
juri troy architects
Architekturfotografie Romana Fürnkranz

3.2 /Installation of a window in the roof structure

Standard installation

standard installation

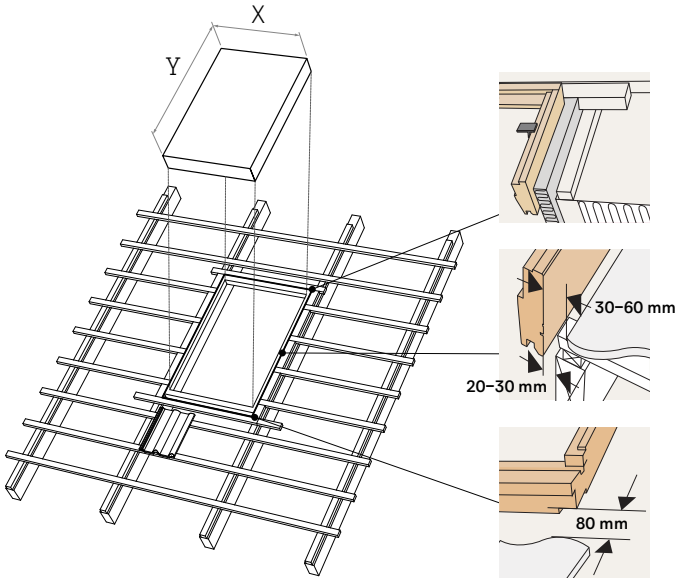
between rafter insulation

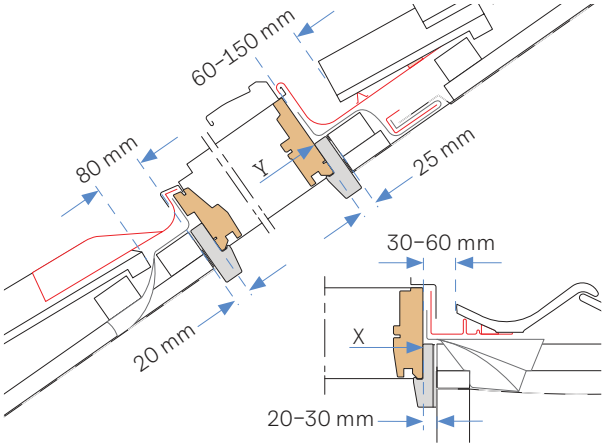


Red level

VELUX standard since 2001.
Mounting brackets are fixed
to the bottom and top frames.

15°–90°





Installation hole size

standard installation
flashing EDW, EDS

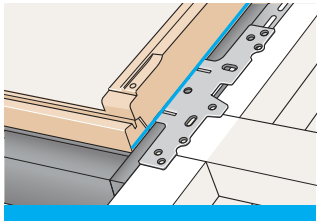
	X	X+60	Y	Y+45
CK02	550	610	778	823
CK04	550	610	978	1023
FK06	660	720	1178	1223
FK08	660	720	1398	1443
MK04	780	840	978	1023
MK06	780	840	1178	1223
MK08	780	840	1398	1443
MK10	780	840	1600	1645
PK06	942	1002	1178	1223
PK08	942	1002	1398	1443
PK10	942	1002	1600	1645
SK06	1140	1200	1178	1223
SK08	1140	1200	1398	1443
SK10	1140	1200	1600	1645
UK08	1340	1400	1398	1443
UK10	1340	1400	1600	1645

3.2 /Installation of a window in the roof structure

Recessed installation

recessed installation

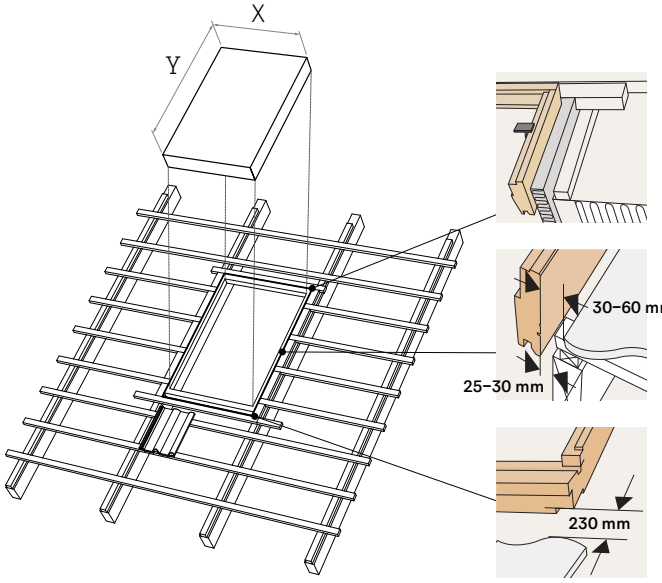
between rafter insulation

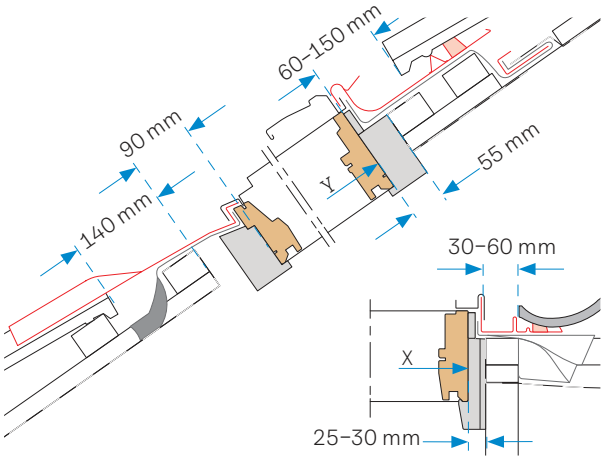


Blue level

Roof window installed 40 mm deeper into the roof construction compared to installations in red level. Mounting brackets are fixed to the side frames.

20°–90°





Installation hole size

recessed installation
flashing EDJ, EDN

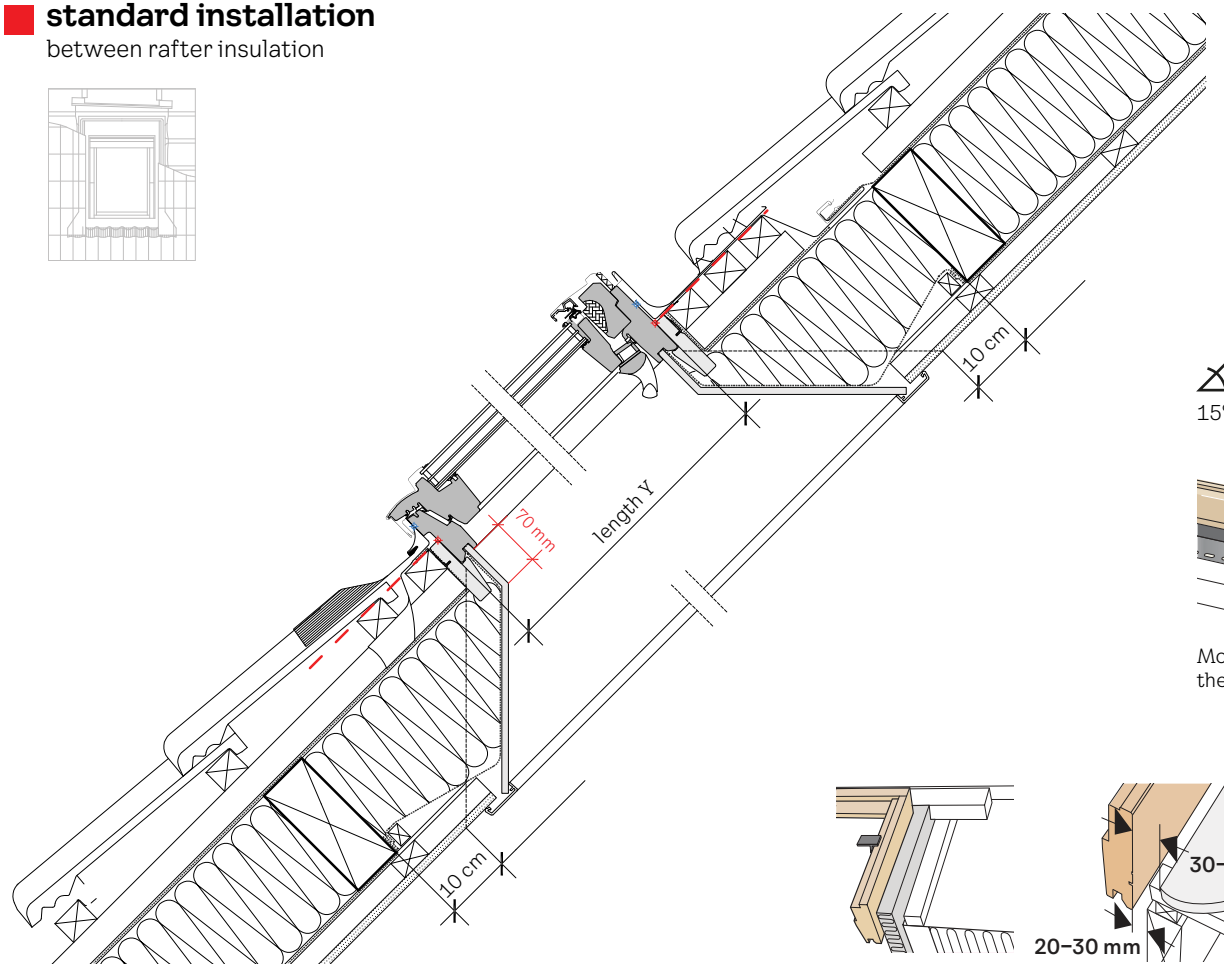
	X	X+60	Y	Y+145
CK02	550	610	778	923
CK04	550	610	978	1123
FK06	660	720	1178	1323
FK08	660	720	1398	1543
MK04	780	840	978	1123
MK06	780	840	1178	1323
MK08	780	840	1398	1543
MK10	780	840	1600	1745
PK06	942	1002	1178	1323
PK08	942	1002	1398	1543
PK10	942	1002	1600	1745
SK06	1140	1200	1178	1323
SK08	1140	1200	1398	1543
SK10	1140	1200	1600	1745
UK08	1340	1400	1398	1543
UK10	1340	1400	1600	1745

3.2 /Installation of a window in the roof structure

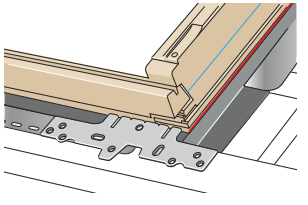
Standard installation

standard installation

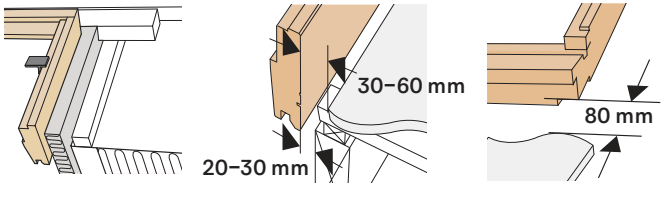
between rafter insulation



15°–90°



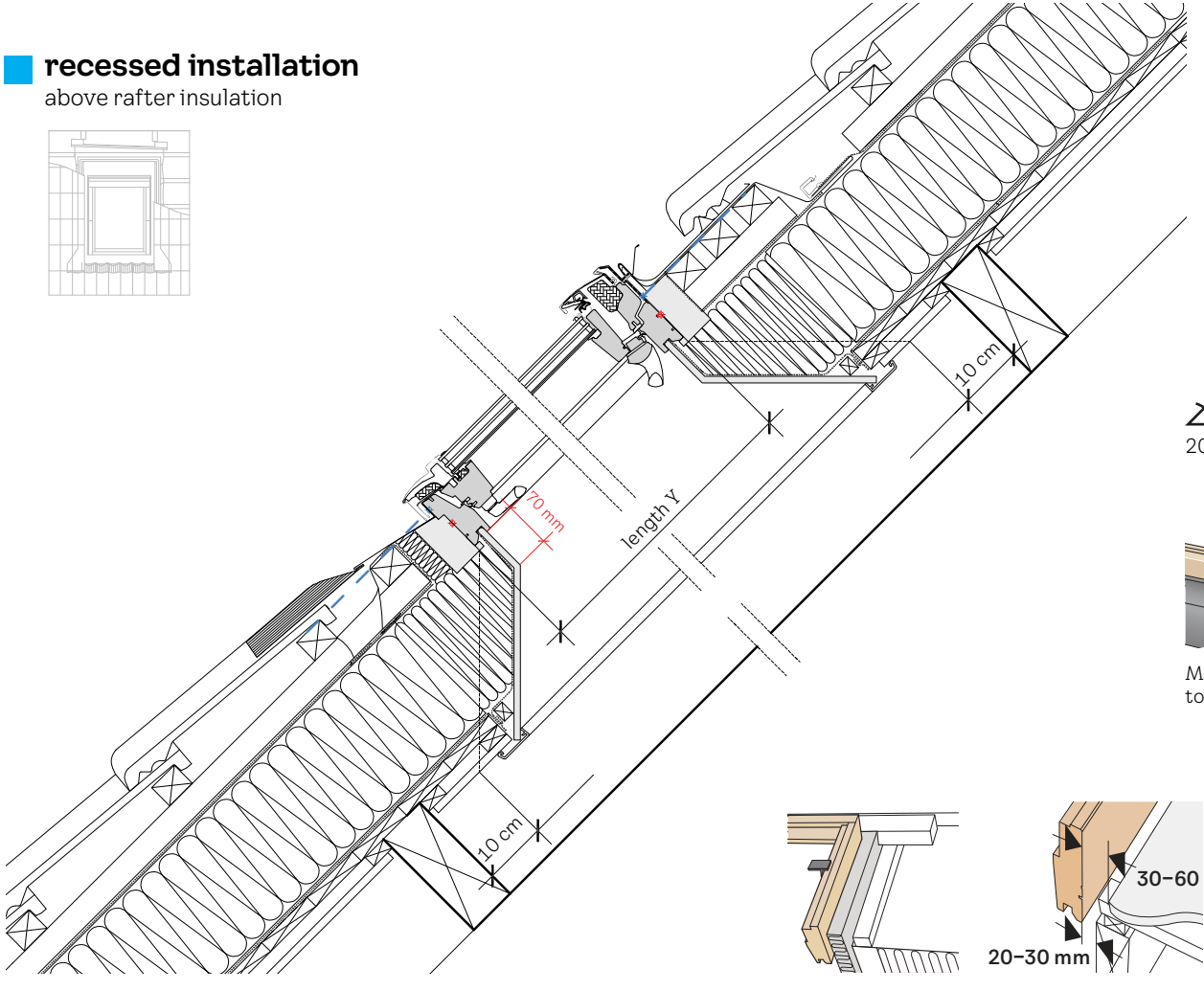
Mounting brackets are fixed to the bottom and top frames.



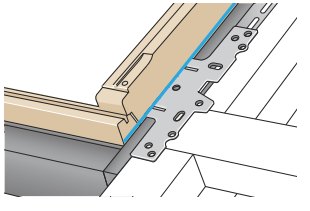
3.2 /Installation of a window in the roof structure

Recessed installation

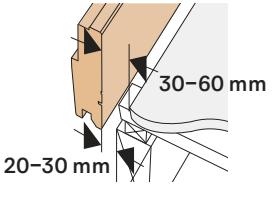
recessed installation
above rafter insulation

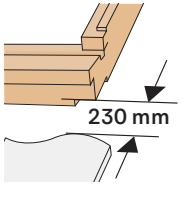


20°–90°



Mounting brackets are fixed to the side frames.

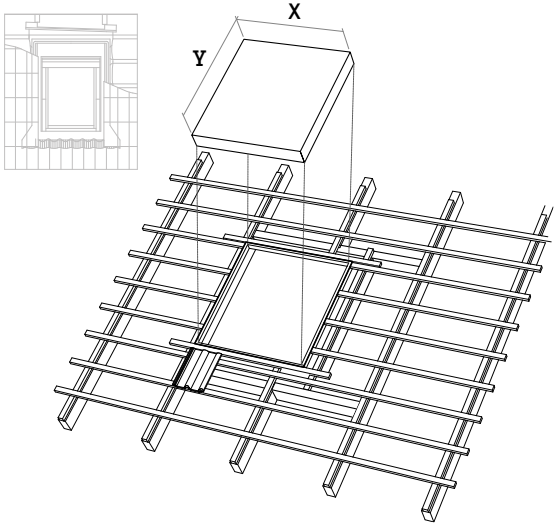




3.2 /Installation of a window in the roof structure

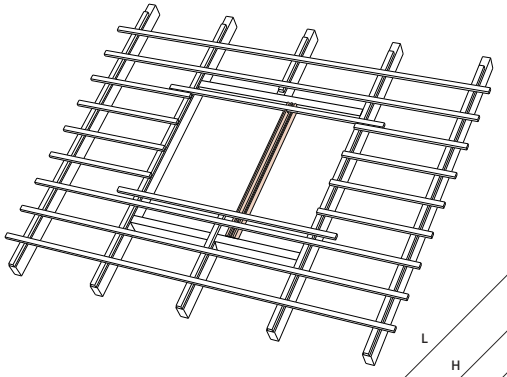
rafter replacement

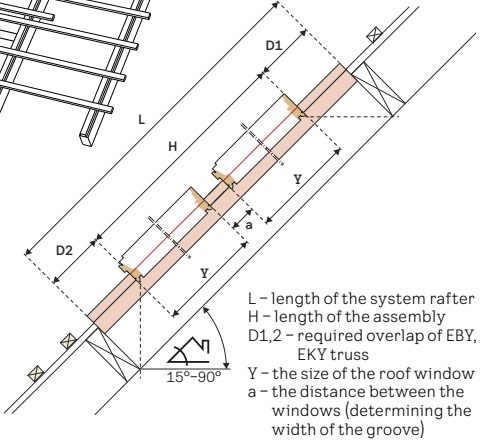
standard installation



rafter replacement – EBY/EKY

standard installation

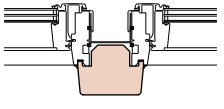




L – length of the system rafter
H – length of the assembly
D1,2 – required overlap of EBY, EKY truss
Y – the size of the roof window
a – the distance between the windows (determining the width of the groove)

Interior rafter EKY

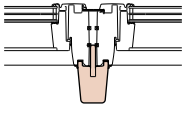
EKY W35 – length 3500 mm



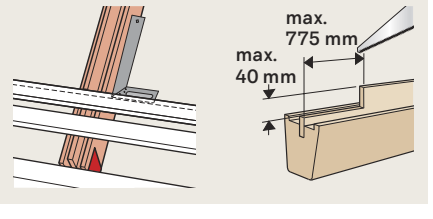
Distance of window frames 100 mm
- unlimited installation width
- standard roof installation
- recessed installation in the roof
- wood coated with a water-based white lacquer

Interior truss EBY

EBY W35 – length 3500 mm

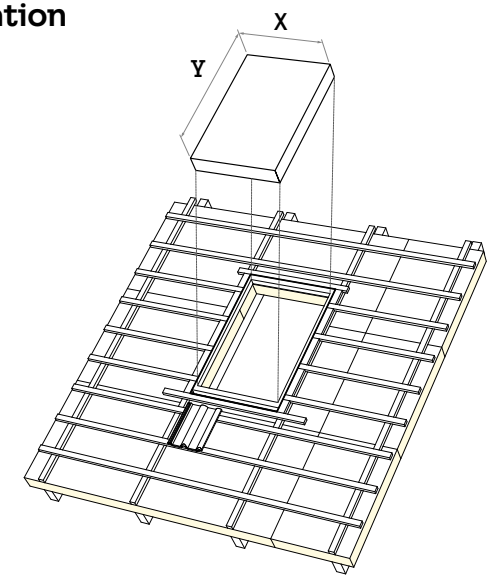


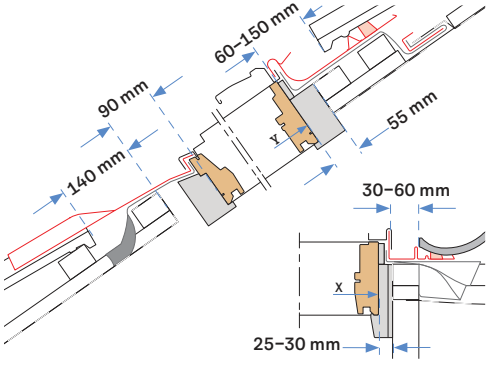
Distance of window frames 18 mm
- maximum assembly width 2780 mm
- standard roof installation
- wood coated with a water-based white lacquer



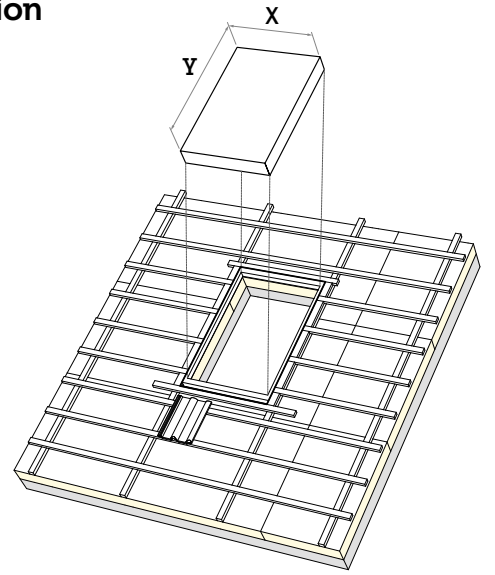
3.2 /Installation of a window in the roof structure

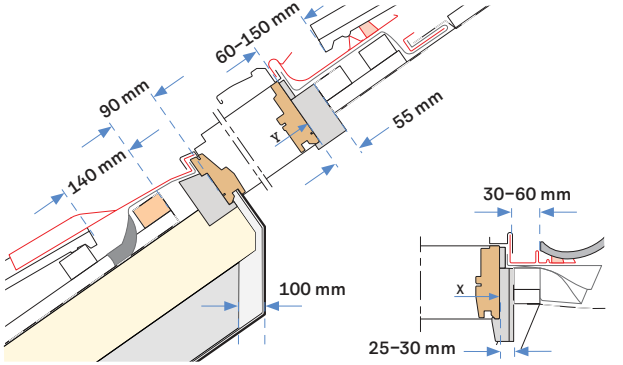
recessed installation
above rafter insulation





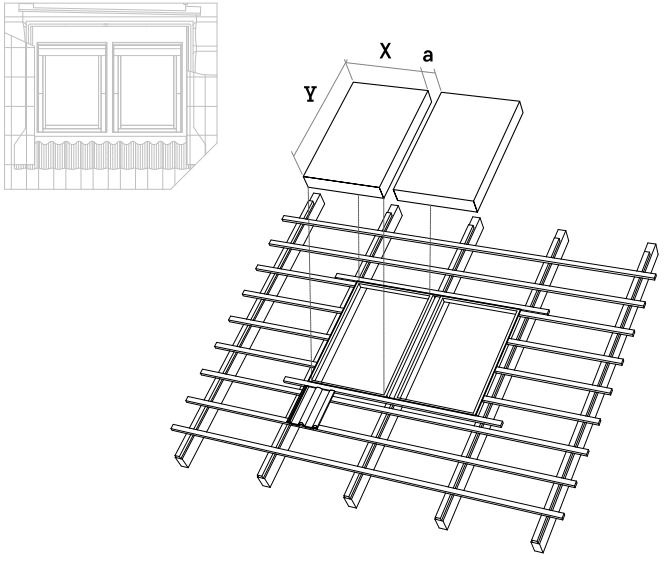
recessed installation – concrete roof





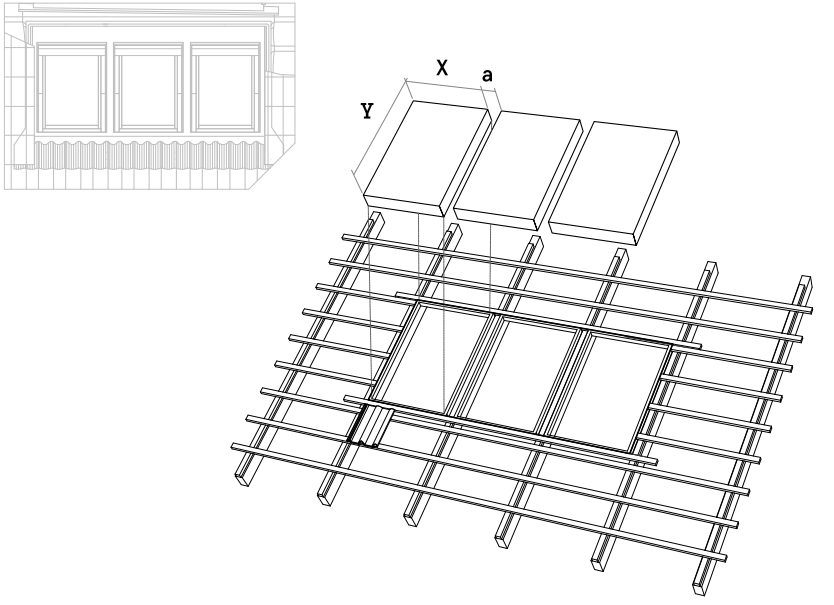
3.2 /Installation of a window in the roof structure

twin or coupled combination solution



clear distance between window frames:
a = min. 60 mm, max. 400 mm

standard frame distances of
100 mm, 120 mm, 140 mm and 160 mm

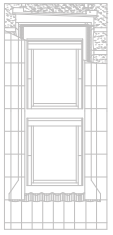


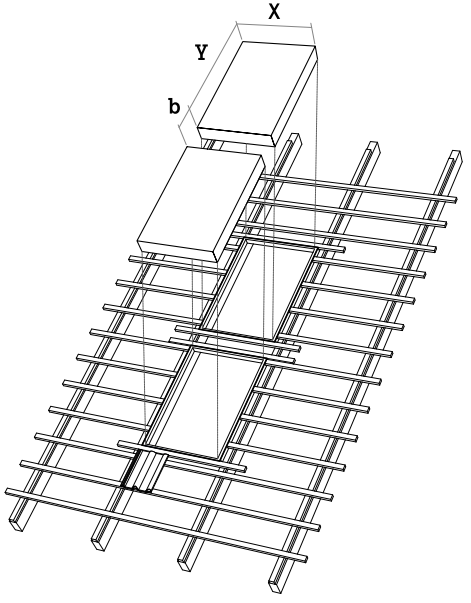
clear distance between window frames:
a = min. 60 mm, max. 400 mm

standard frame distances of
100 mm, 120 mm, 140 mm and 160 mm

3.2 /Installation of a window in the roof structure

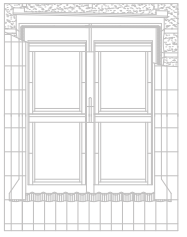
vertical duo solution

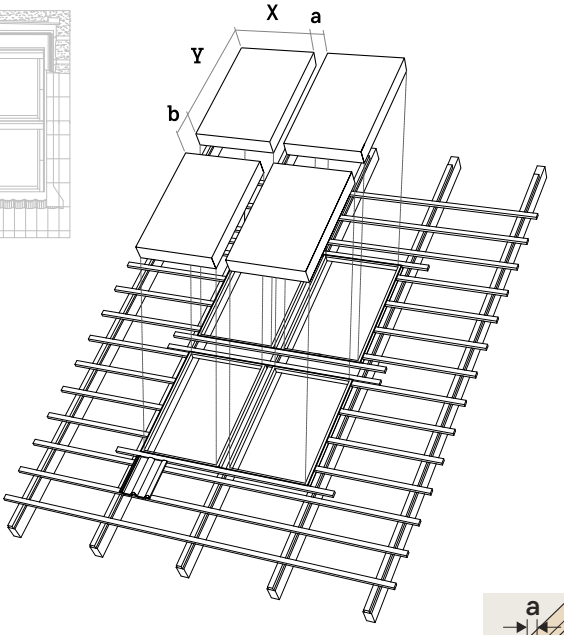




clear distance between window frames on top of each other: b = 100 mm or 250 mm

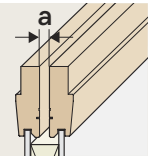
quattro solution

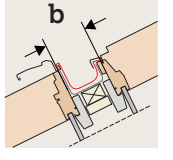




clear distance between window frames next to each other:
a = min. 60 mm, max. 400 mm

clear distance between window frames on top of each other:
b = 100 mm or 250 mm



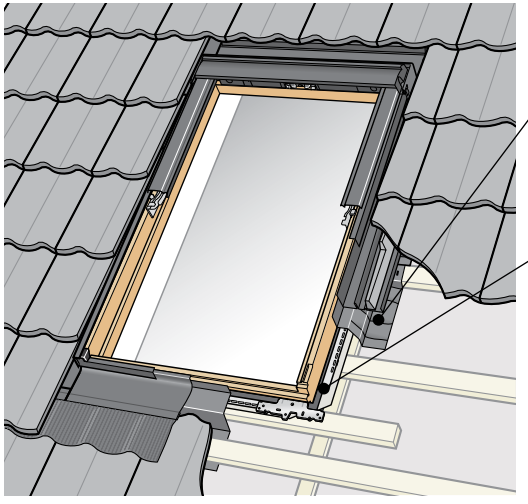


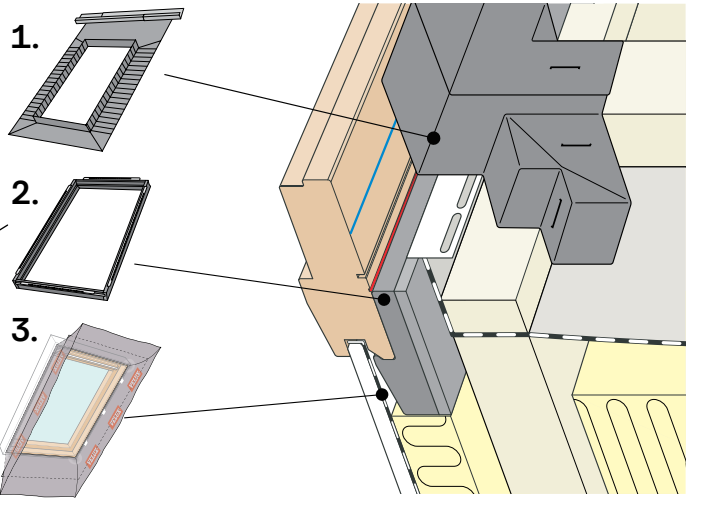
3.2 /Installation of a window in the roof structure

roof window installation system

solution for connection joints in all planes of the roof

Roof window flashing
Depending on the type of roofing, we choose the right type of roof window flashing.





1.

Underfefelt collar BFX
for watertightness of the roof window. It includes a drainage gutter for connecting the waterproofing layer of the roof.

2.

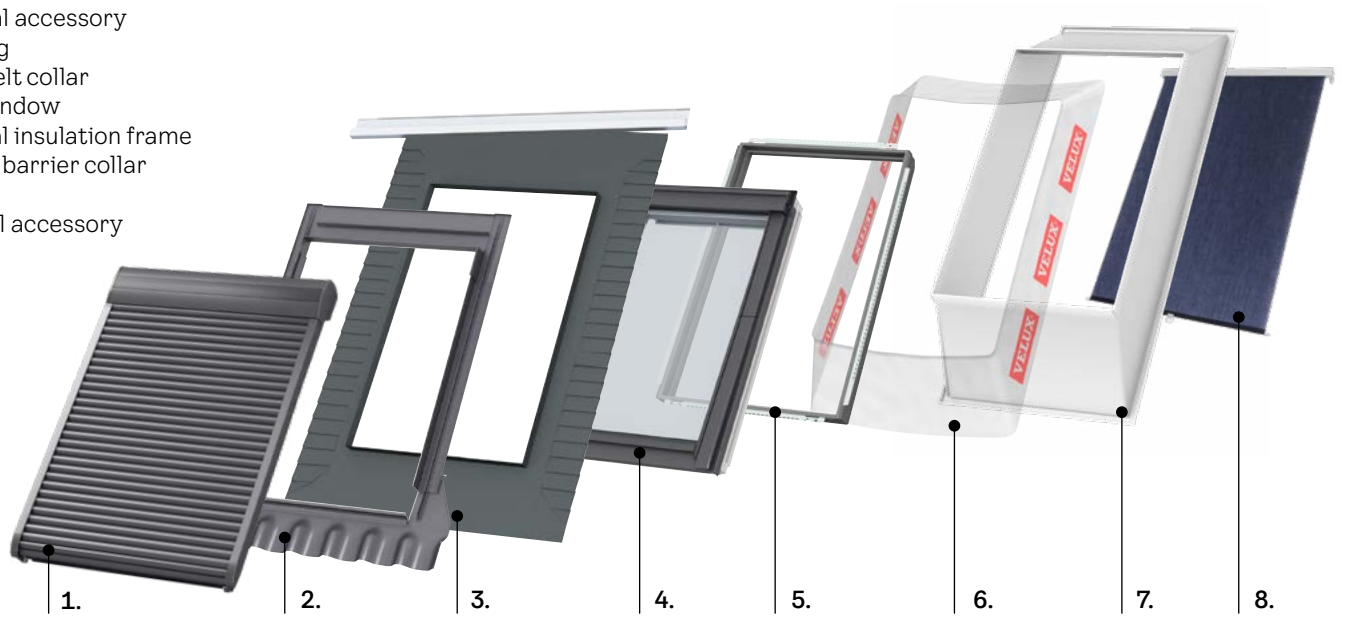
Insulation collar / insulation / set BDX, for the correct connection of the window frame to the roof insulation.

3.

VELUX vapour barrier BBX
for vapour-tight connection of the roof window.

3.2 /Installation of a window in the roof structure

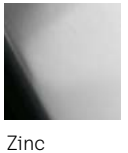
1. External accessory
2. Flashing
3. Underfelt collar
4. Roof window
5. Thermal insulation frame
6. Vapour barrier collar
7. Lining
8. Internal accessory

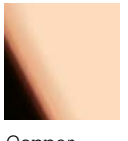


Available materials for window cladding and flashing


Aluminum, dark grey

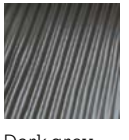

Aluminum, black


Zinc

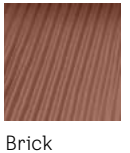

Copper

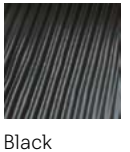

Aluminum, any colour

Cuff materials


Dark grey


Ochre

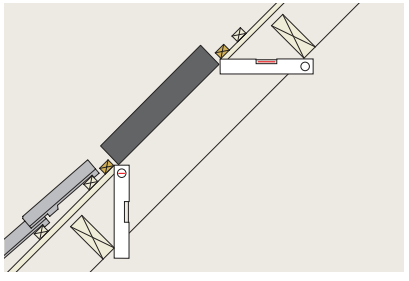

Brick


Black

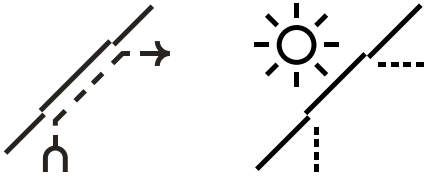

Any colour

3.2 /Installation of a window in the roof structure

Roof window lining

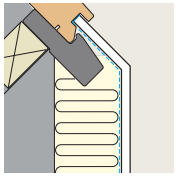


air circulation around the inner surface of the glazing / horizontal upper lining / vertical lower lining / replacements not interfering with oblique lining



upper lining horizontal / lower lining on the opposite vertical / heat source under the roof window keeping the inner surface of the glazing at a higher temperature / bigger supply of light into the room

The lighter the colour, the more daylight is reflected from the lining

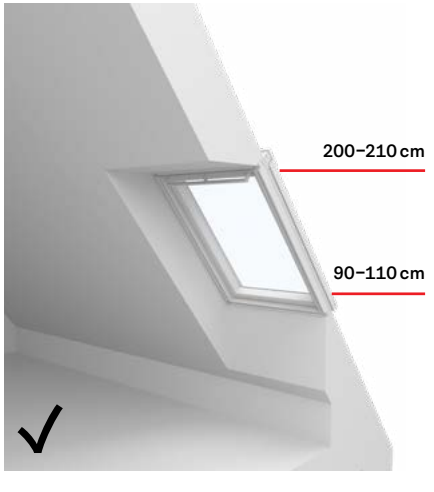


Rise of the lining from the roof window frame towards the ceiling 7–8 cm.

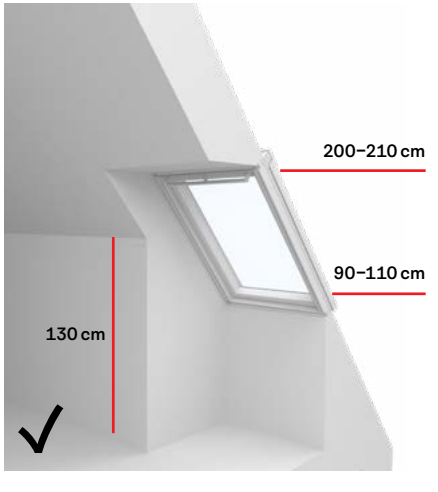
roof window installation height

Too high attic knee wall

Optimum height of attic knee wall



Solution of attic knee wall and recess for the roof window

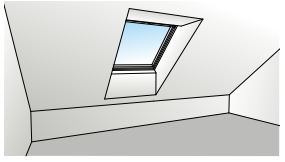


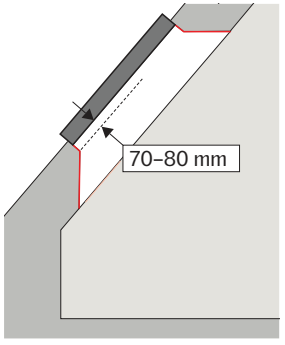
3.2 /Installation of a window in the roof structure

Roof window lining

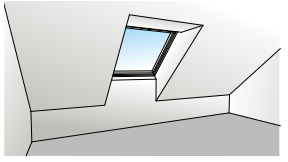
lining shapes

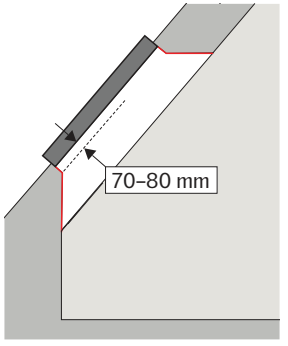
Standard installation



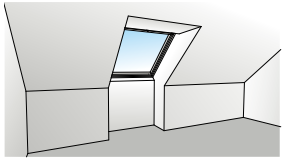


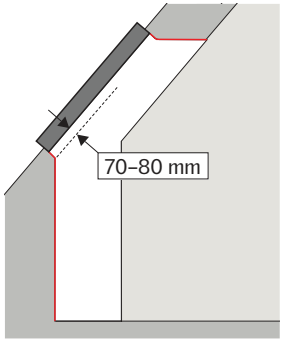
In the plane of the attic wall



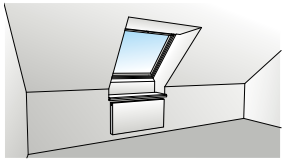


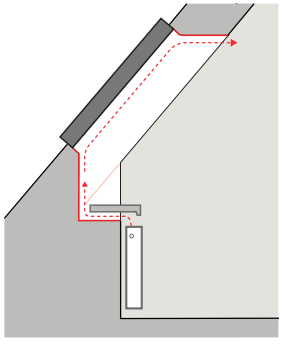
Lining niche in the wall



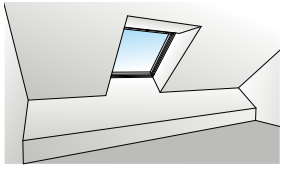


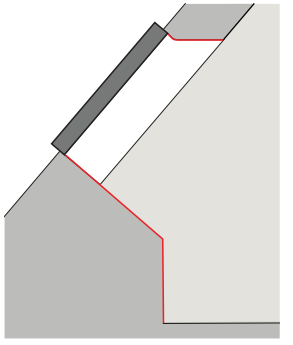
Ventilated window sill





Deep lining



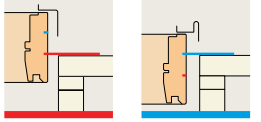


Note: Not suitable for rooms with a higher risk of condensation.

3.3 /Roof window installations

Flashing

Roof windows	120 mm 15°–90°	2×8 mm 15°–90°	2×8 mm 15°–90°	16 mm 15°–90°	25–40 mm 15°–90°	 15°–90°	2×19 mm 25°–90°	2×8 mm 20°–90°	90 mm 20°–90°
	EDW	EDS	EDL		EDQ	EDE	EDB	EDN	EDJ
	EBW	EBS	EBL						
	EKW	EKS	EKL			EKE	EKB	EKN	EKJ
	EKW ---7- + EDW	EKS ---7- + EDS	EKL ---7- + EDL			EKE ---7- + EDE	EKB ---7- + EDB	EKN ---7- + EDN	EKJ ---7- + EDJ
	EFW	EFS	EFL					EFN (20°–55°)	EFJ (20°–55°)
	EFW --22-/--32-	EFS --22-/--32-	EFL --22-/--32-					EFN --22-/--32- (20°–55°)	EFJ --22-/--32- (20°–55°)
	EDW*	EDS*	EDL*			EDE*			
	ETW--00 + EDW	ETS--00 + EDS	ETL--00 + EDL			ETE + EDE		ETN --00 + EDN	ETJ --00 + EDJ
GDL GIL GIL	ETW --00 + ETW --00- + EKW	ETS --00 + ETS --00- + EKS	ETL --00 + ETL --00- + EKL					ETN --00 + ETN --00- + EKN	ETJ --00 + ETJ --00- + EKJ
	EKX --88							EKX --88 (20°–55°)	
	EEW + EEX**	EES + EEX**	EEL + EEX**						
10°	EAW (10°–75°)	EAS (20°–75°)							
a=160 mm	EAW 6-21E/6-31E (10°–75°)	EAS 6-21E/6-31E (20°–75°)							



Red level
VELUX standard since 2001.
Mounting brackets are fixed to the bottom and top frames.

Blue level
Roof window installed 40 mm deeper into the roof construction compared to installations in red level.
Mounting brackets are fixed to the side frames.

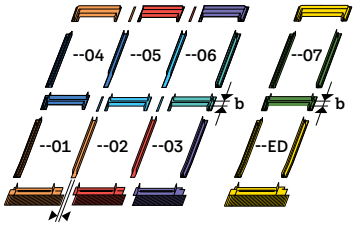
* MK08/PK19/SK19
** M08

3.3 /Roof window installations

Flashing

EK-

Codes for parts in assembly --W/S/J/N



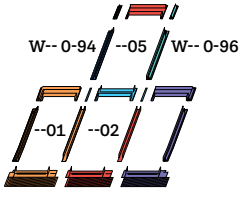
--00 Part 0
--01 Part 1 (a)
--02 Part 2 (a)
--03 Part 3 (a)
--04 Part 4 (a) (b)
--05 Part 5 (EKX) (a) (b)
--06 Part 6 (b)
--07 Part 7 (b)
--21 Part 1 and 3 together

frame distance a = 100, 120, 140 or 160 mm
(min. 60 mm, max. 400 mm)
b = 100 or 250 mm

EK-

Asymmetric combination

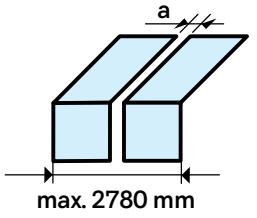
only in standard installation



3.3 /Roof window installations

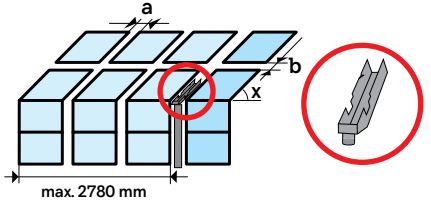
Flashing

EF-
--W/S



frame distance a = 18 or 100 mm
b = 0 mm

EF-
XK99 (all special combinations)



Maximum width 2780 mm
a = 100 mm
b = 100 mm or 250 mm
x° = roof pitch 15–55°

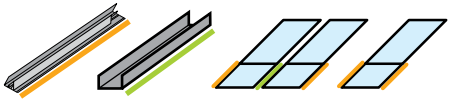
Number of roof windows = 2 to ∞
a = min. 60 mm, max. 400 mm
b = 100 mm or 250 mm
x° = roof pitch 15–55°

Combinations with a total width of more than 2780 mm require drainage between the windows.

3.3 /Roof window installations

Flashing

ET-

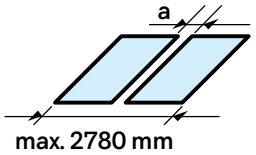


Single installation with GIL/GIU:
ET- side parts right and left

Combination with GIL/GIU:
ET- +ET- --00- medium gutter for GIL/GIU
frame distance a = 100, 120, 140 a 160 mm

EB-

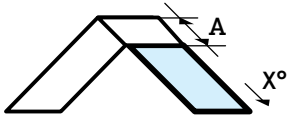
only in standard installation



special frame distance a = 18
with prefabricated EBY rafter

EKX

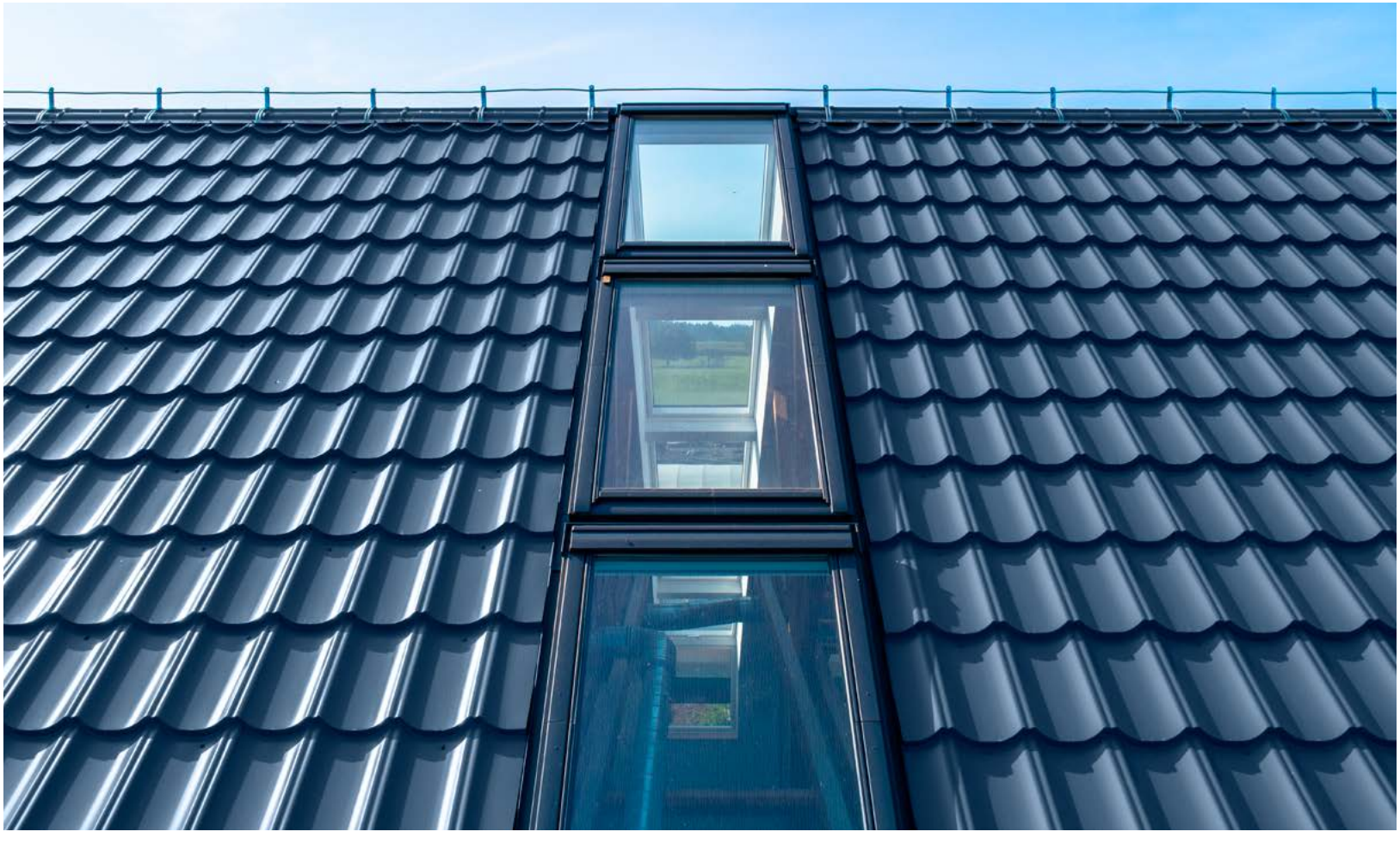
Roof ridge



A – "ridge measurement". This is the distance from the top frame of the window to upper side of battens on the opposite roof surface.
X – roof pitch

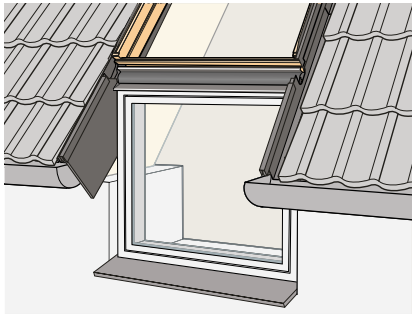
3.3 /Roof window installations

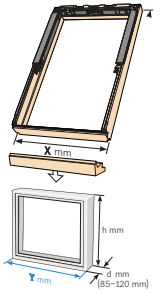
Flashing

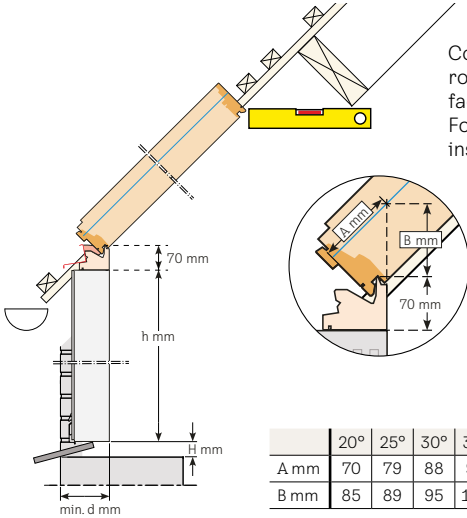


3.4 /Tips and tricks

connection of roof and facade window with installation element





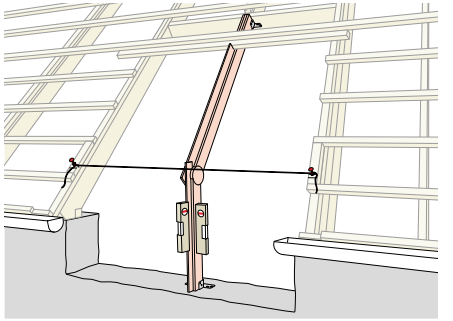


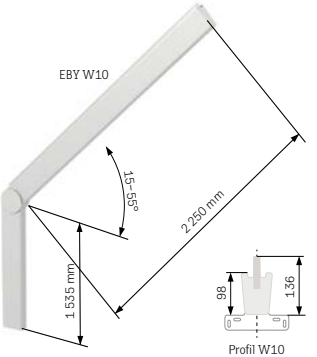
Connecting element for roof windows and facade panels EFY 3012. For 2 different installation types ■ ■.

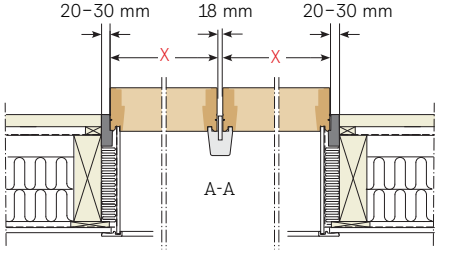
	20°	25°	30°	35°	40°	45°	50°	55°
A mm	70	79	88	99	110	124	140	160
B mm	85	89	95	102	110	121	134	152

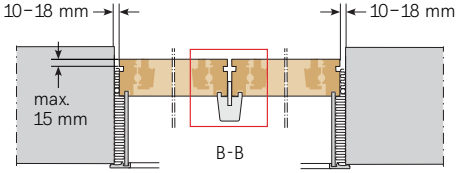
Installation with adjustable s Vertical window elements upport rafter EBY W10

15°–55°





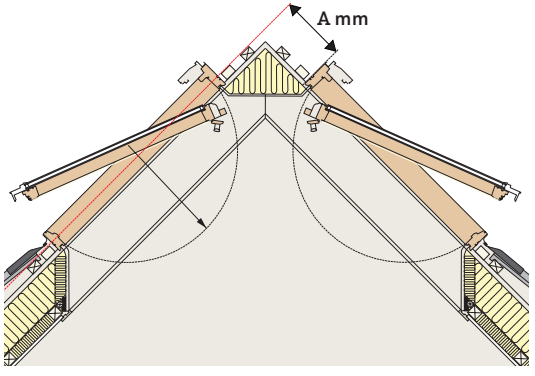




3.4 /Tips and tricks

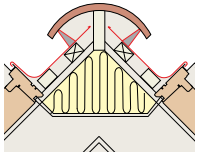
Installation along roof ridge

When installing roof windows at the ridge of the roof, it is important to know the "ridge dimension". This is the distance from the upper frame of the window to the upper edge of the battens on the inside surface of the roof. In the following text, this distance is referred to as "A" mm.

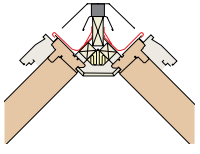


When fitting pivot hung roof windows with upper frames near the roof ridge, keep in mind that their location must allow them to open without the sash interfering with each other.
This can be achieved by following the degree "A" according to the following table:

The slope of the roof	Window height (mm)				
	780	980	1180	1400	1600
30°	80	80	80	80	100
35°	80	80	90	120	140
40°	90	110	140	170	185
45°	120	160	250	300	330
50°	230	290	340	400	460



If the dimension "A" is 200 mm or larger, standard flashing can be used without special modifications.

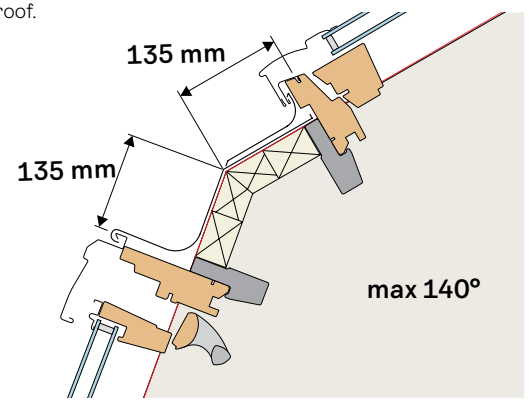


Whether it is one pair or more pairs of roof windows, the top flashing sections must be adjusted according to the distance "A" to the roof ridge. Follow the instructions supplied with the roof ridge kit.

In a roof with a slope of less than 30°, roof windows can be installed right next to each other without the risk of sash collisions (degree of "A" must always be at least 80 mm).

Mansard roof

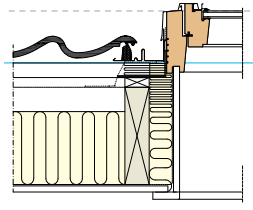
Even with a mansard roof, it is possible to fit roof windows on both sides of the roof plane break. It is necessary to observe the basic distances of the window flashing and the maximum slope of the roof.



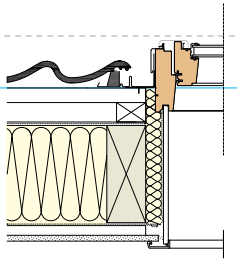
3.4 /Tips and tricks

development of roof window installation

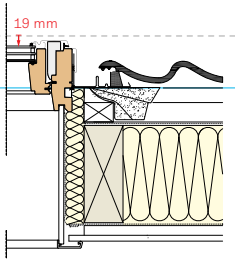
installation of windows in the years 1990–2002 / standard installation



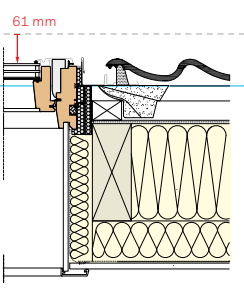
installation of windows in the years 2002–2013 / standard installation



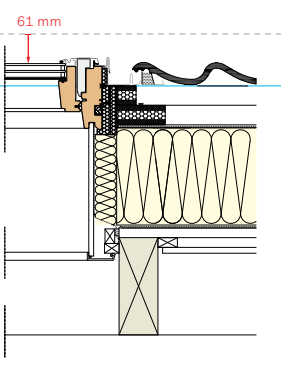
installation of windows since 2013 / standard installation



recessed installation



installation of windows in above rafter insulation / recessed installation

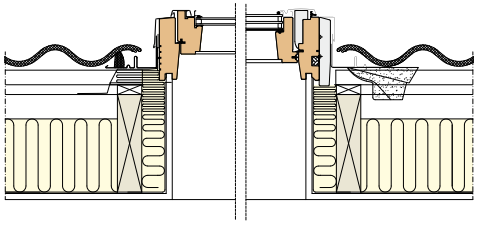


replacement of roof windows

replacement of roof windows without interfering with the lining

1990–2002
window installation

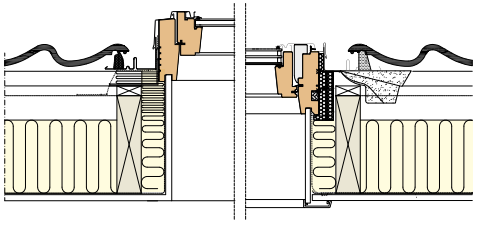
new roof window with special flashing for window replacement EDW 6000



replacement of roof windows with intervention in the lining

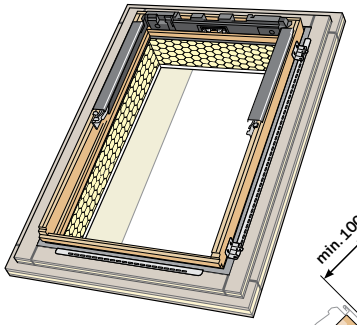
1990–2002
window installation

new roof window, recessed installation

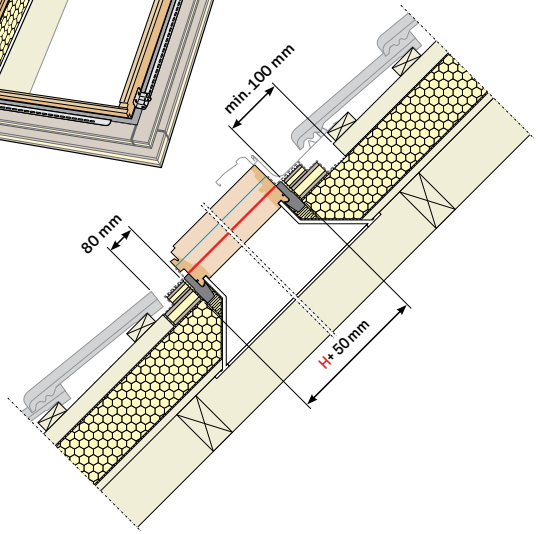


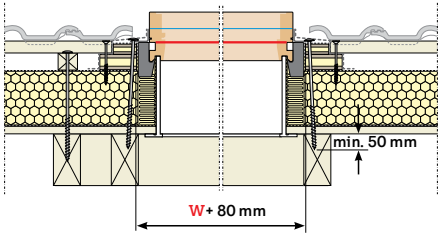
3.4 /Tips and tricks

insulating frame/above truss insulation



can be used for perfect connection of the window to the above rafter insulation system special insulating collar made of load-bearing thermal insulation materials

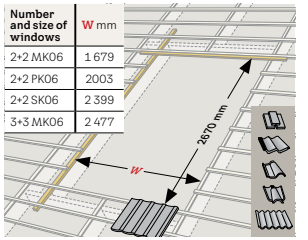


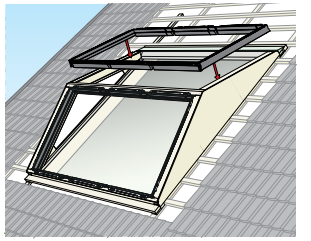


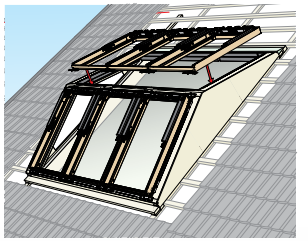
VELUX dormer solution EBW

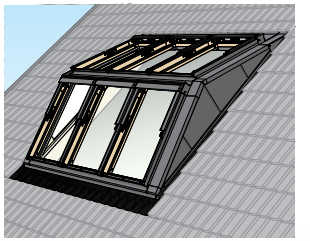
Dormer flashings allow for installing VELUX roof windows to be lifted out of the roof, creating extra space inside. The dormer flashings come in the exact size and shape to create a perfect, watertight fit to the VELUX roof window of your choice. The dormer flashings also come in kits that make it possible to combine multiple roof windows.

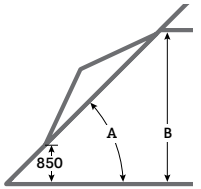
Number and size of windows	W mm
2+2 MK06	1 679
2+2 PK06	2003
2+2 SK06	2 399
3+3 MK06	2 477









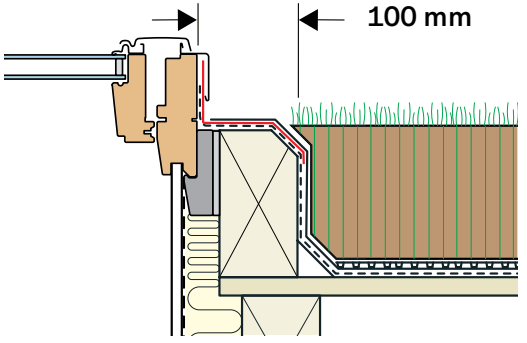


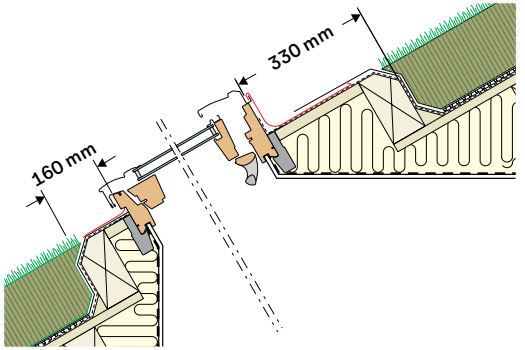
A	min. B mm
35°	2 003
40°	2 171
45°	2 328
50°	2 470
55°	2 600
60°	2 714
65°	2 815
70°	2 900

3.4 /Tips and tricks

green roof

When installing the roof window in the green roof, it is necessary to connect the waterproofing layer to the flashing system. The flashing is carried out by a wooden frame, which must be adapted in size to the inner lining.

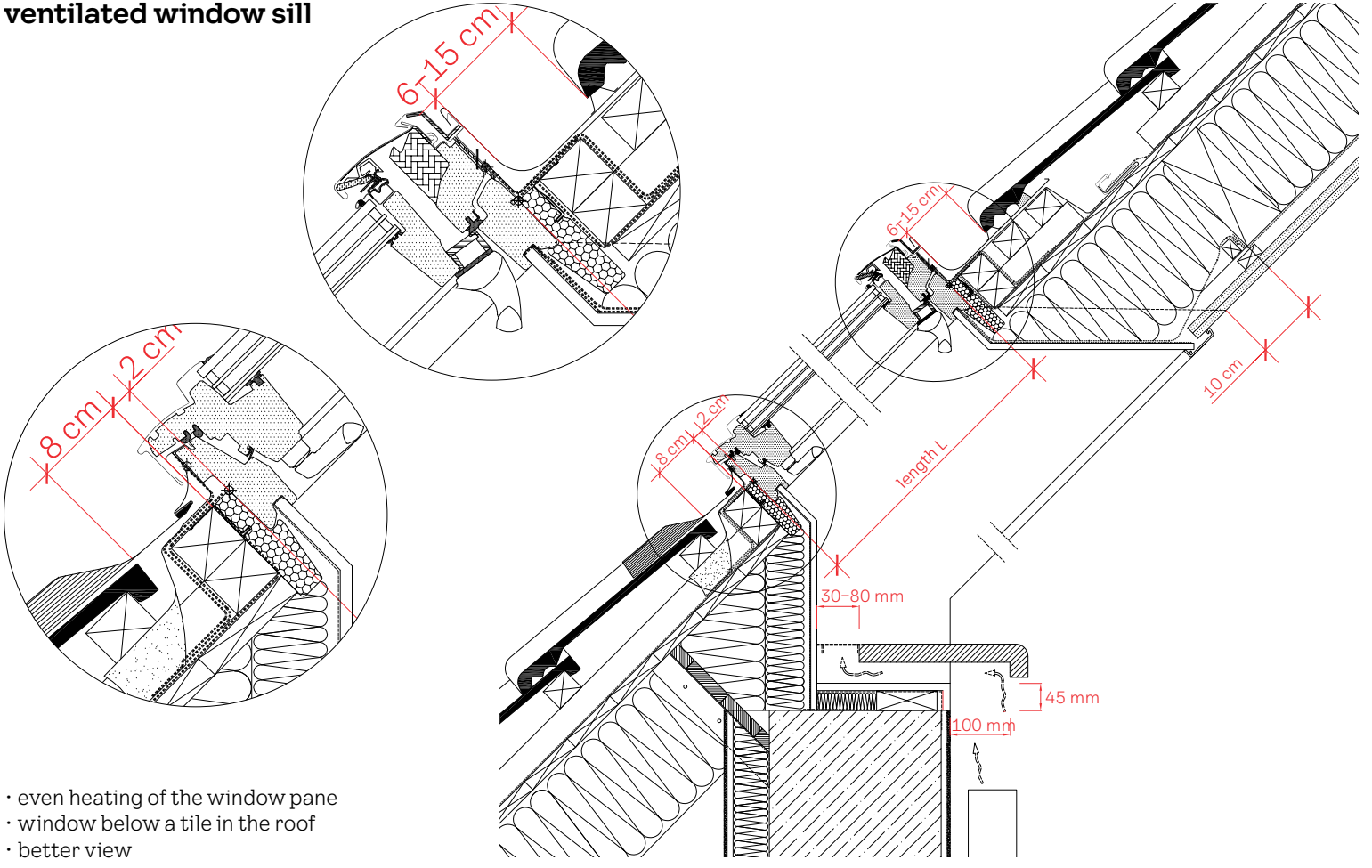




3.4 /Tips and tricks

Drawing of roof windows

ventilated window sill

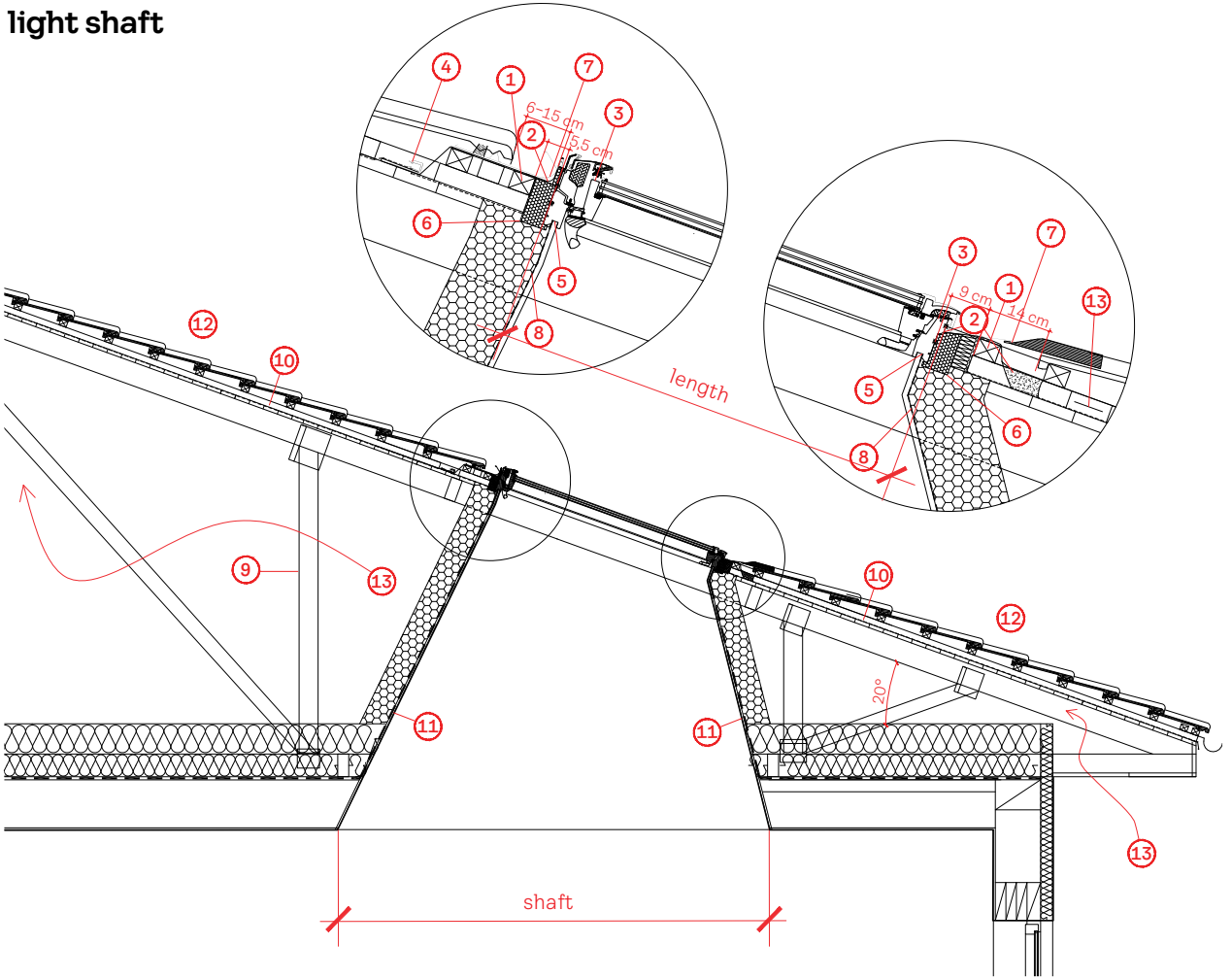


- even heating of the window pane
- window below a tile in the roof
- better view

3.4 /Tips and tricks

Drawing of roof windows

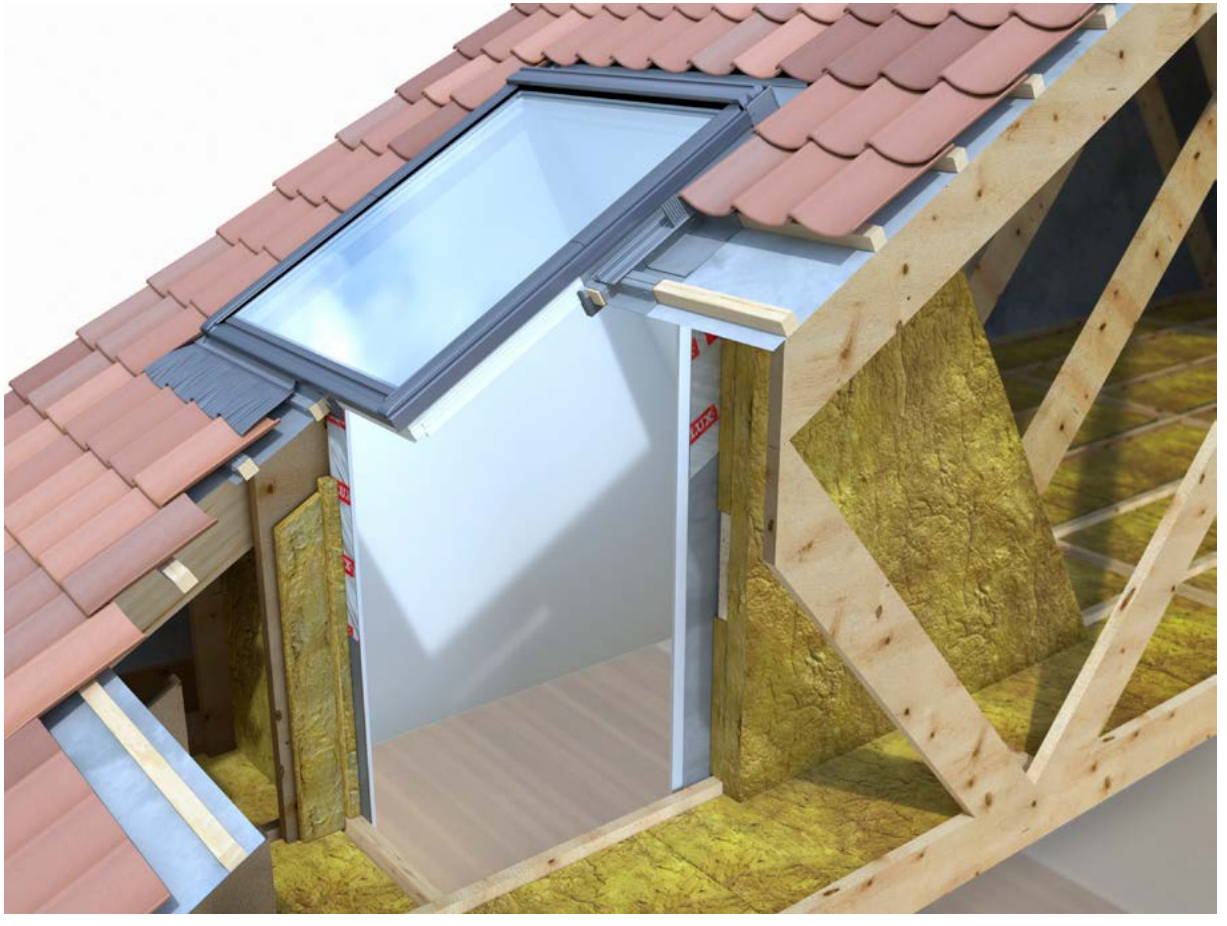
light shaft

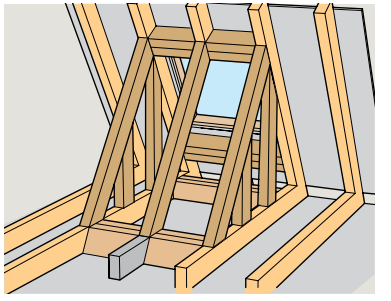


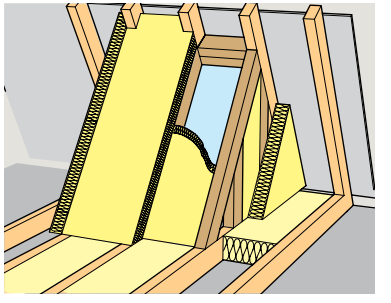
1. roof window mounting rail
2. VELUX BFX underfelt collar
3. recessed installation:
   The window is installed 4 cm deeper than standard, the mounting brackets are installed on the side of the frame at the height of the blue line Electric GGU 006621
4. drainage gutter of the VELUX system (place of connection of the waterproofing sleeve with the waterproofing layer of the roof)
5. connection of BBX vapour barrier to the roof window
6. BDX – thermal insulation frame
7. EDJ 2000 – roof window flashing
8. BBX – VELUX vapour barrier foil
9. hammered roof truss
10. ventilated gap
11. plasterboard 12.5 mm
12. permissible roof pitch for the situation from 20° for recessed installation (standard installation from 15°)
13. Ensure ventilation flow

3.4 /Tips and tricks

Drawing of roof windows

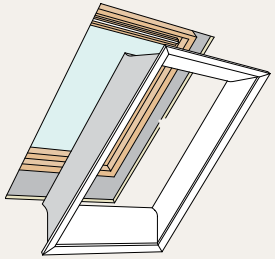


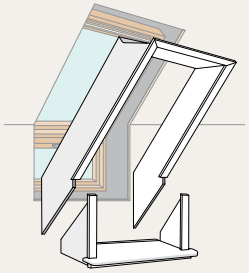


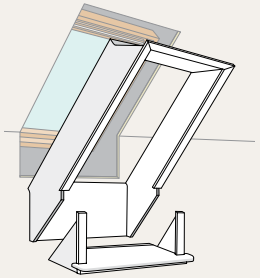


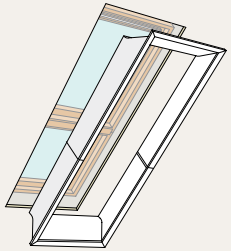
3.4 /Tips and tricks

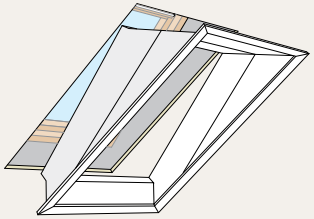
Prefabricated roof window linings

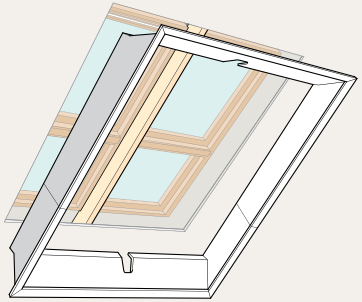


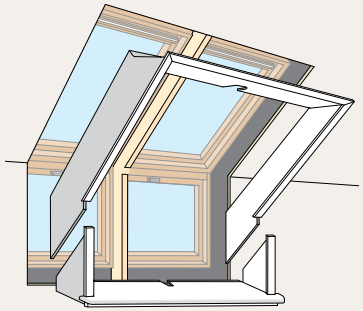












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