5 R53 VERTEX

Contents

NOKIAN PROFILES

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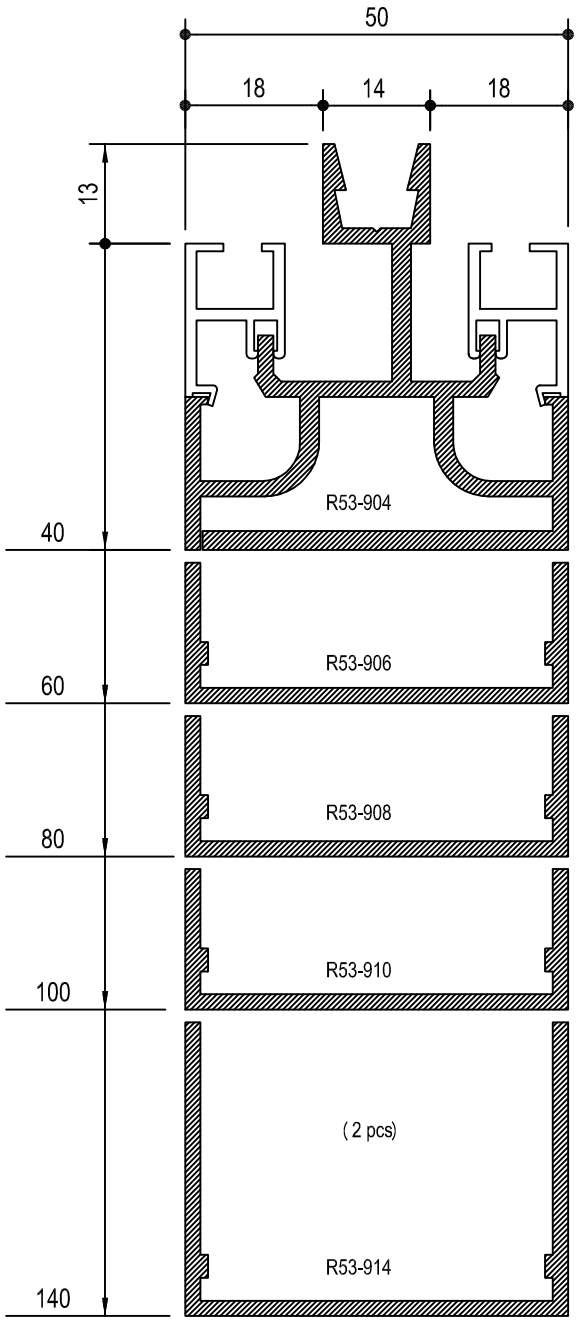
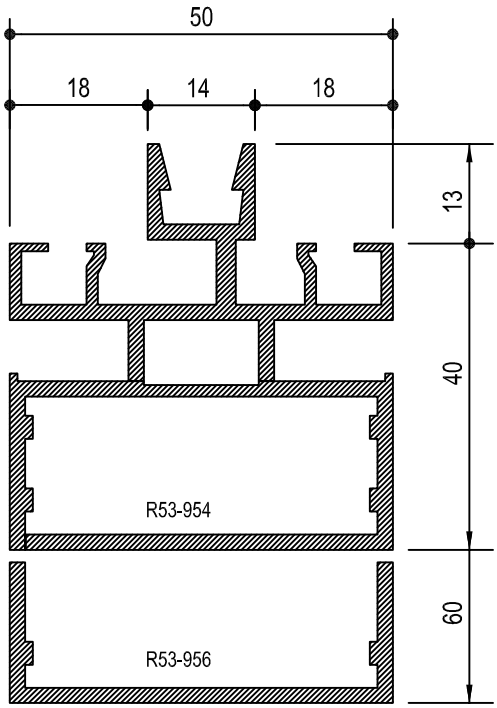
Vertical frame member



Horizontal frame member



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Profiles 1:1

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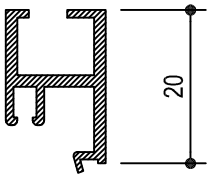
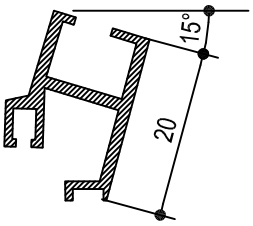
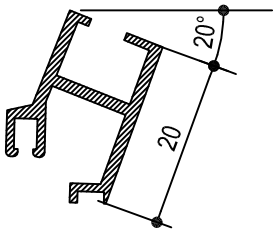
Internal glazing beads



R53-521



R53-522



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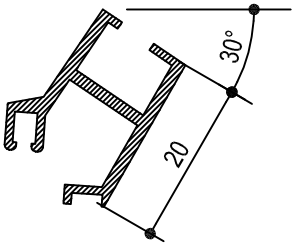
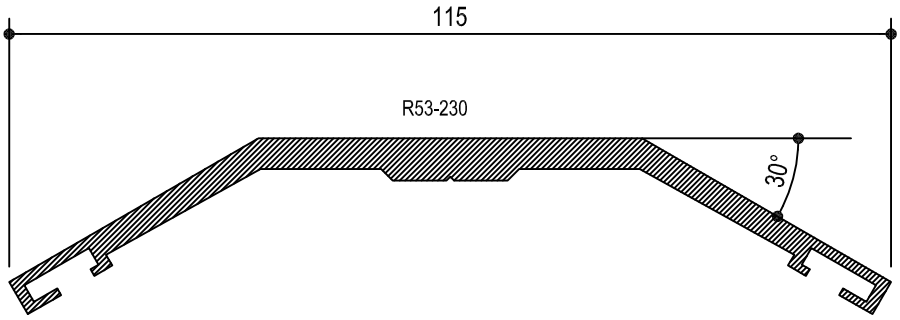
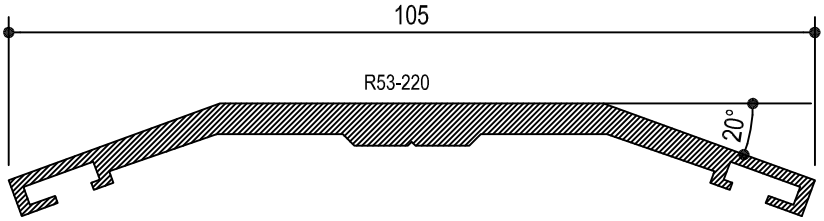
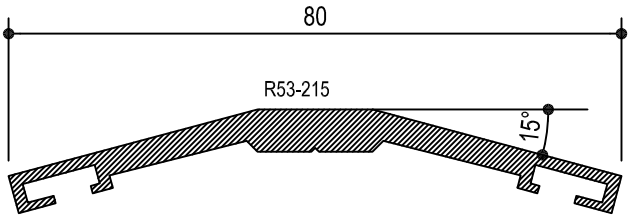


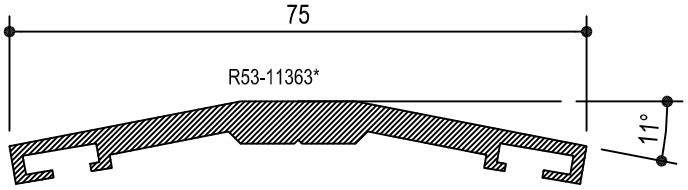
R53-524

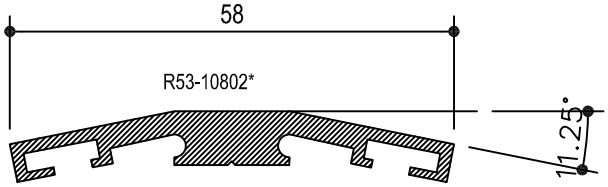
Glazing beads

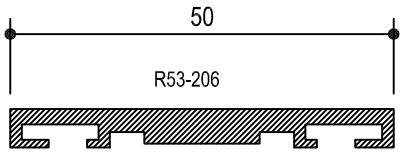






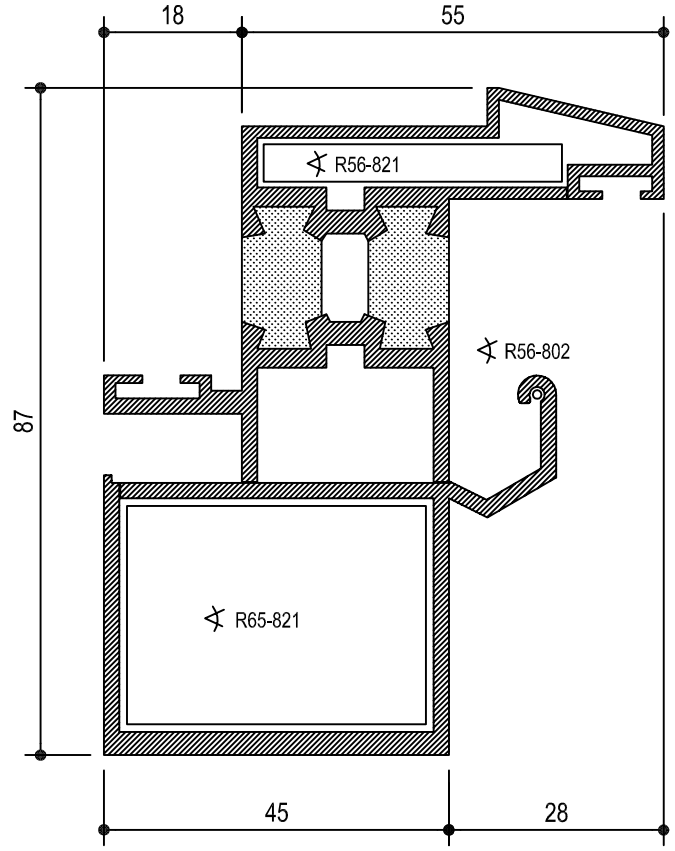




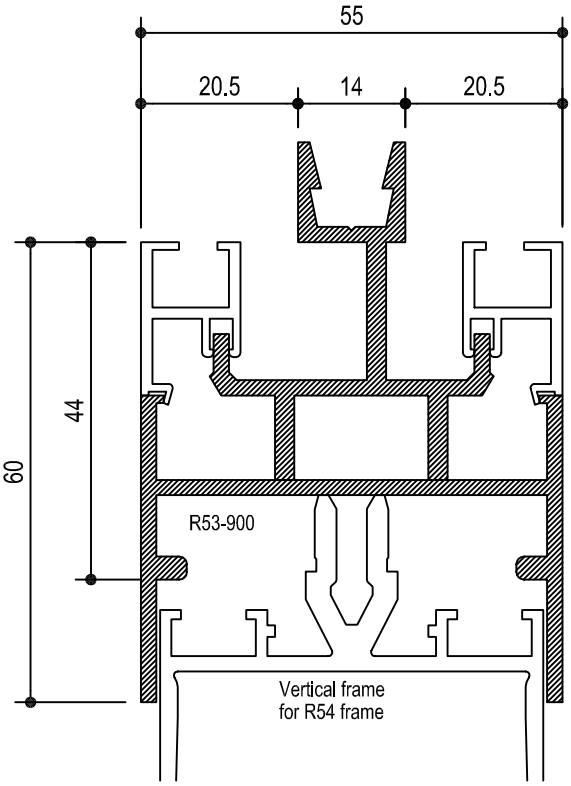


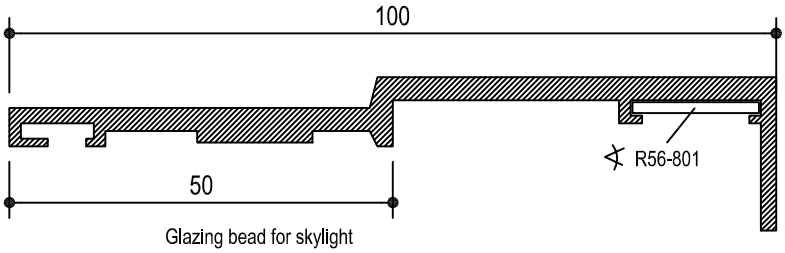
*Factory delivery

Patented and model protected

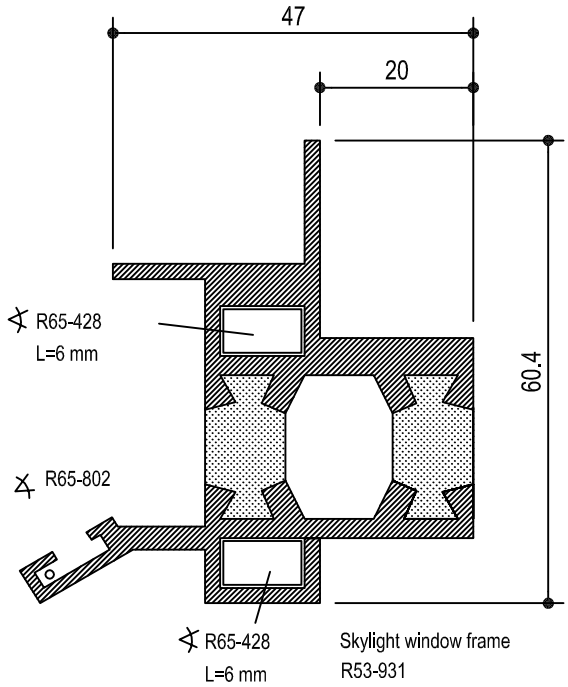


Skylight window frame
R53-935

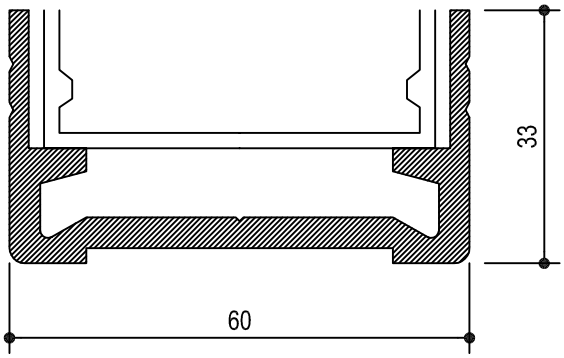




Glazing bead for skylight
R53-210



Skylight window frame
R53-931



Anchoring profile
R53-530

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Profiles 1:1

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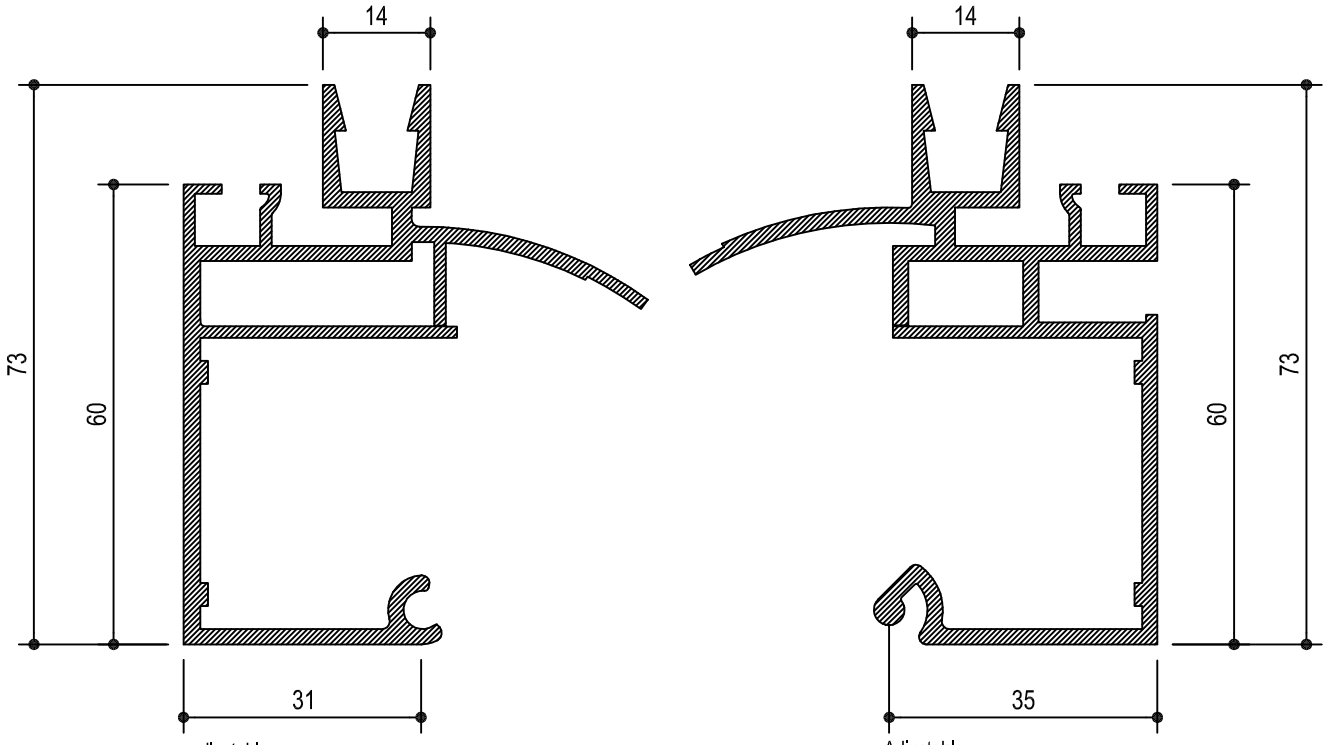
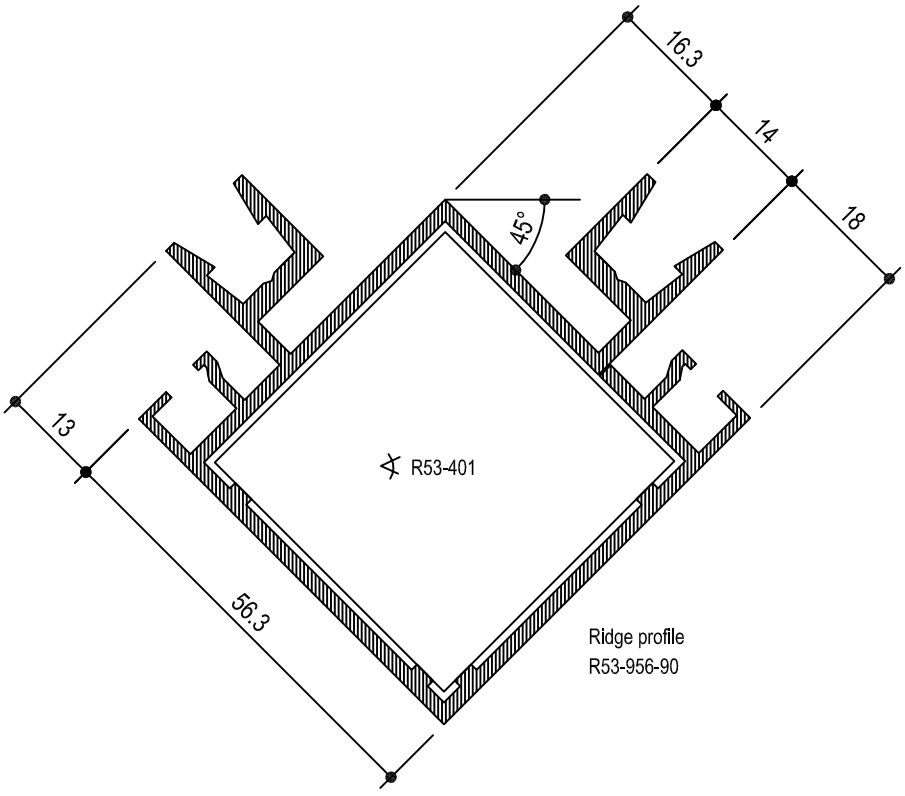


adjustable
eaves profile

R53-956-651

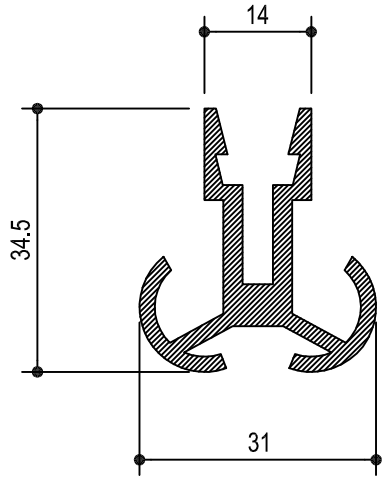
Adjustable
eaves profile

R53-956-652

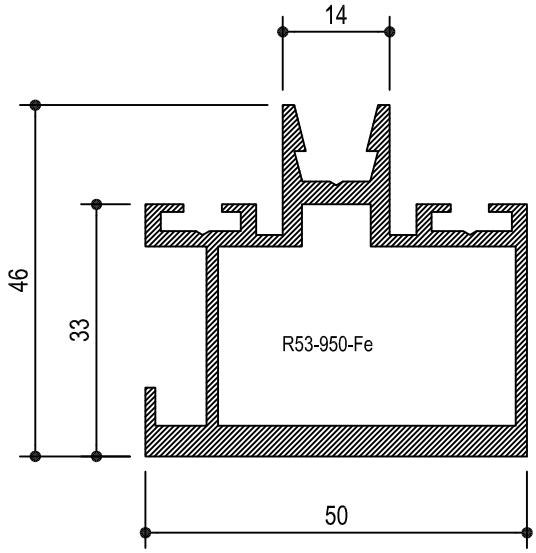


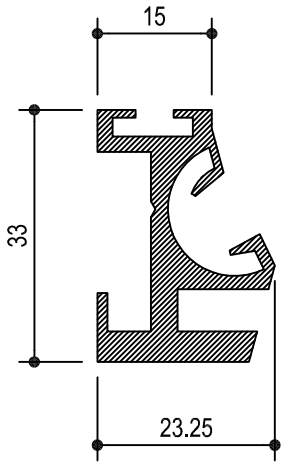
Ridge profile
R53-956-90

Patented and model protected

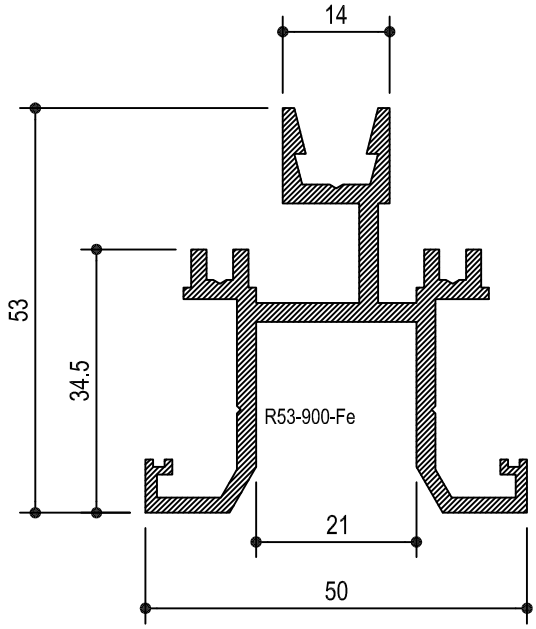


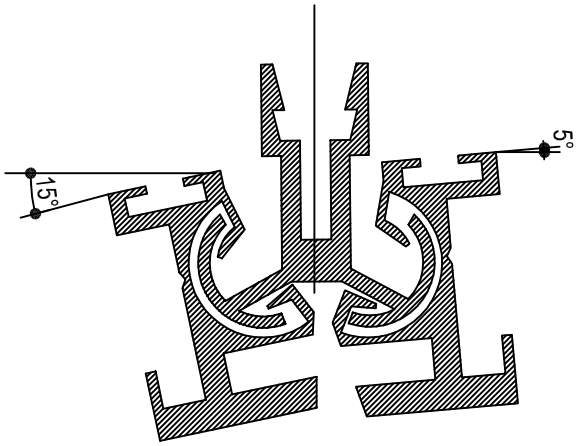
R53-950-S1



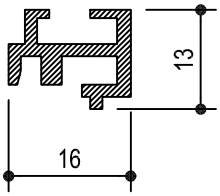


R53-950-S2





R53-526



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Profiles 1:1

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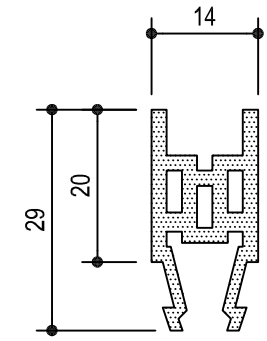
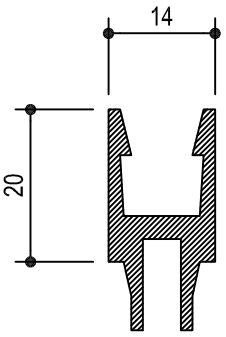
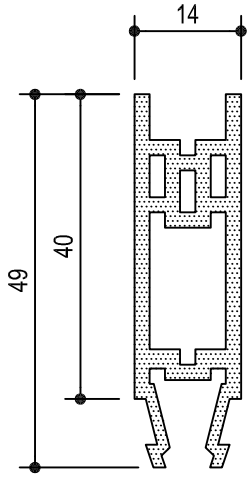


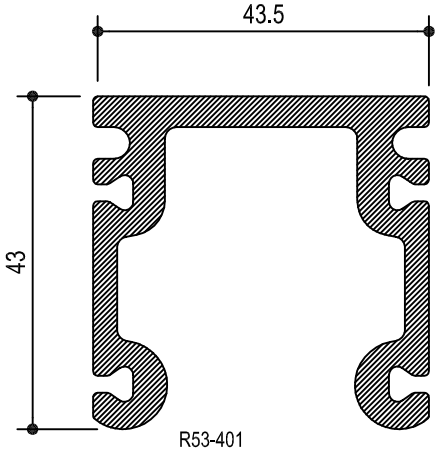
R53-604 Thermal break profile 2k
length plastic



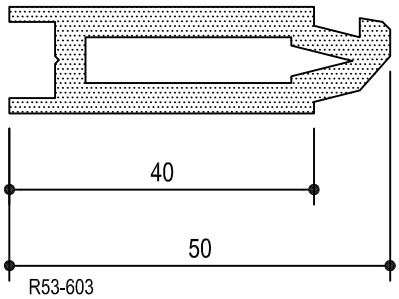
Auxiliary profile
R53-520



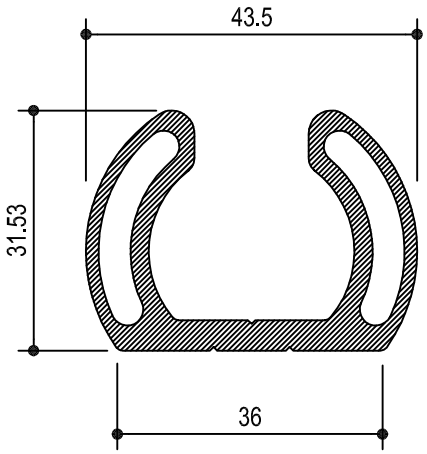
R53-605
Thermal break profile 3k
length plastic



R53-401
Connection profile
length 6,6 m

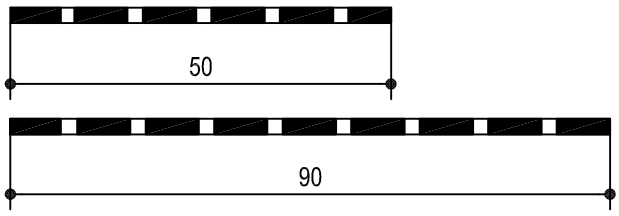


R53-603
glass support 3k
stock length 6600 mm plastic

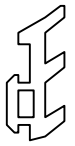


R53-428
optional angle T-joint profile
length aluminium

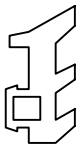
Butyl rubber tape



Patented and model protected

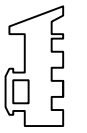


Sealing gasket
N:o 611
EPDM

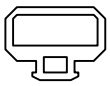


Sealing gasket
N:o 619
EPDM

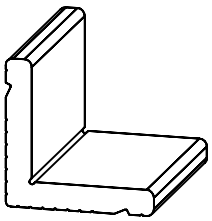
Sealing gasket
N:o 630
EPDM



Sealing gasket
N:o 634
EPDM

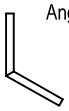


Sealing gasket
N:o 638
EPDM

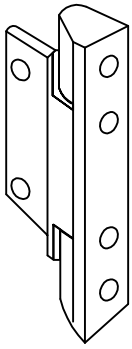


R65-428
Joint profile

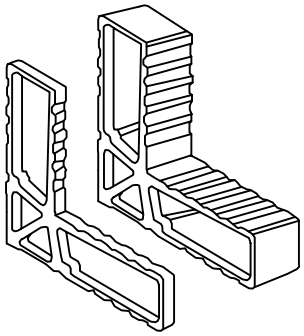
R65-801
Gusset plate



R65-802
Angle clip

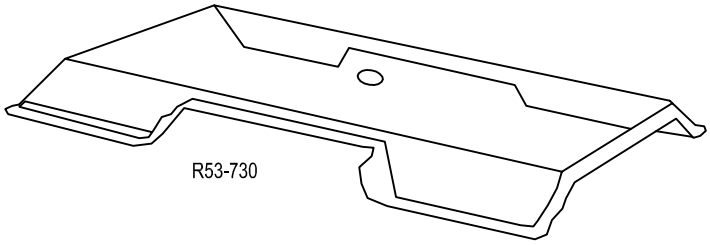


R53-712
Skylight window hinge

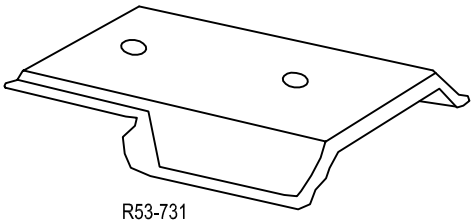


R65-821
Joint profile piece

Covers



R53-730



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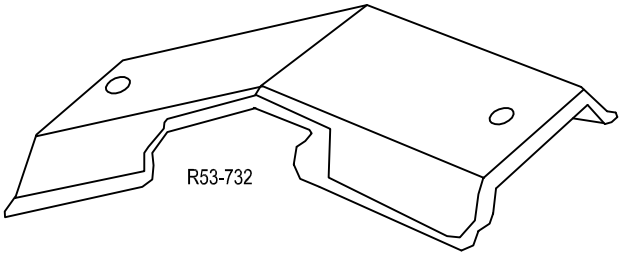
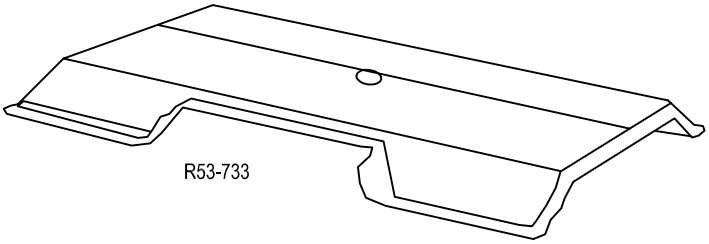
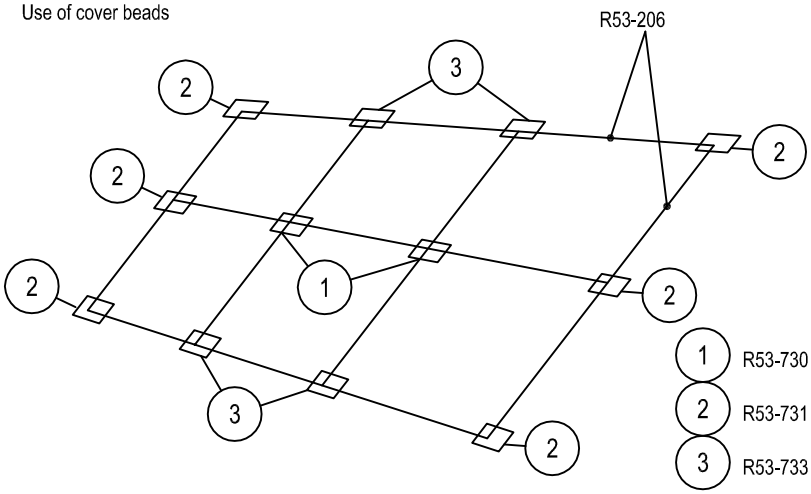


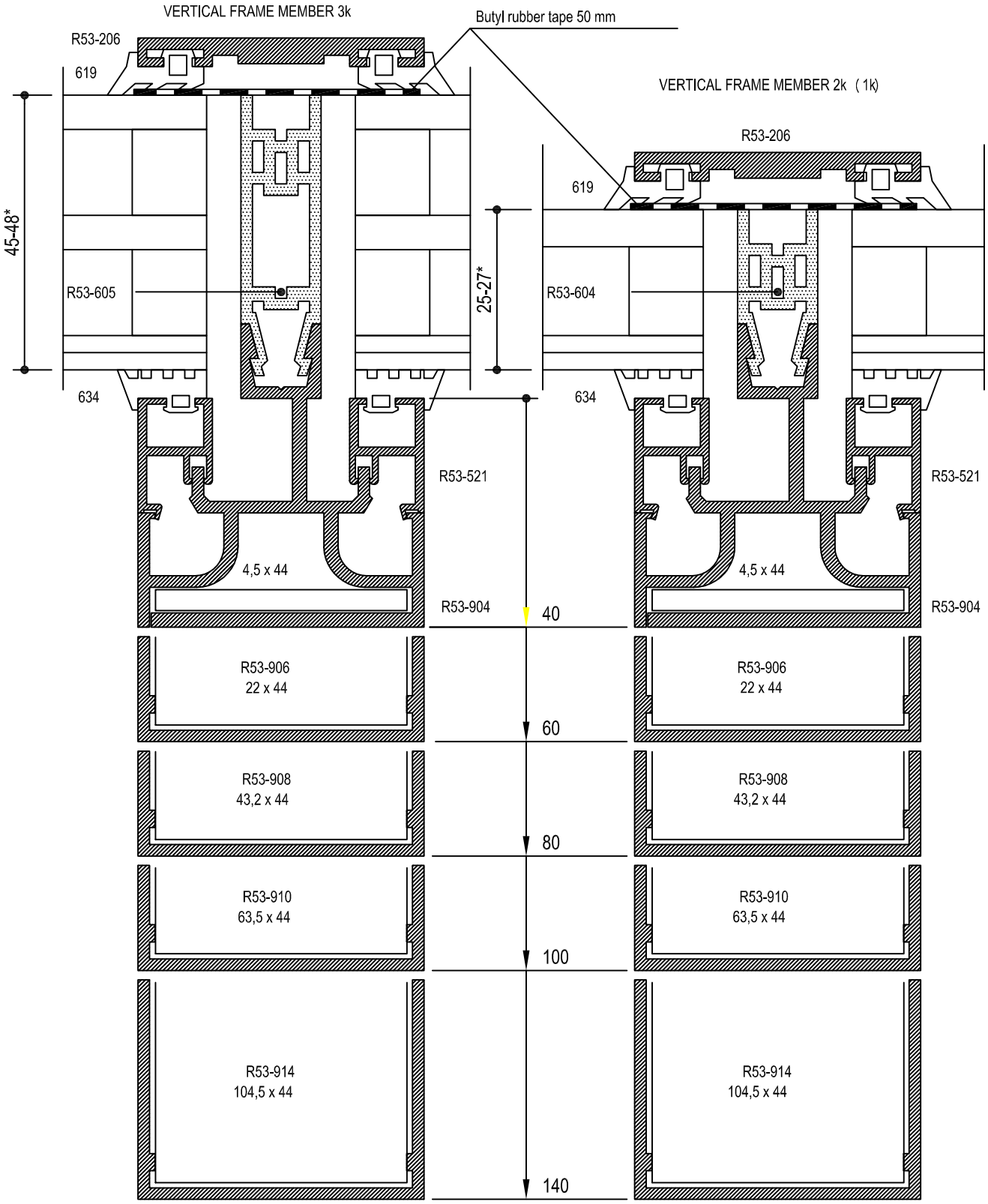
R53-732



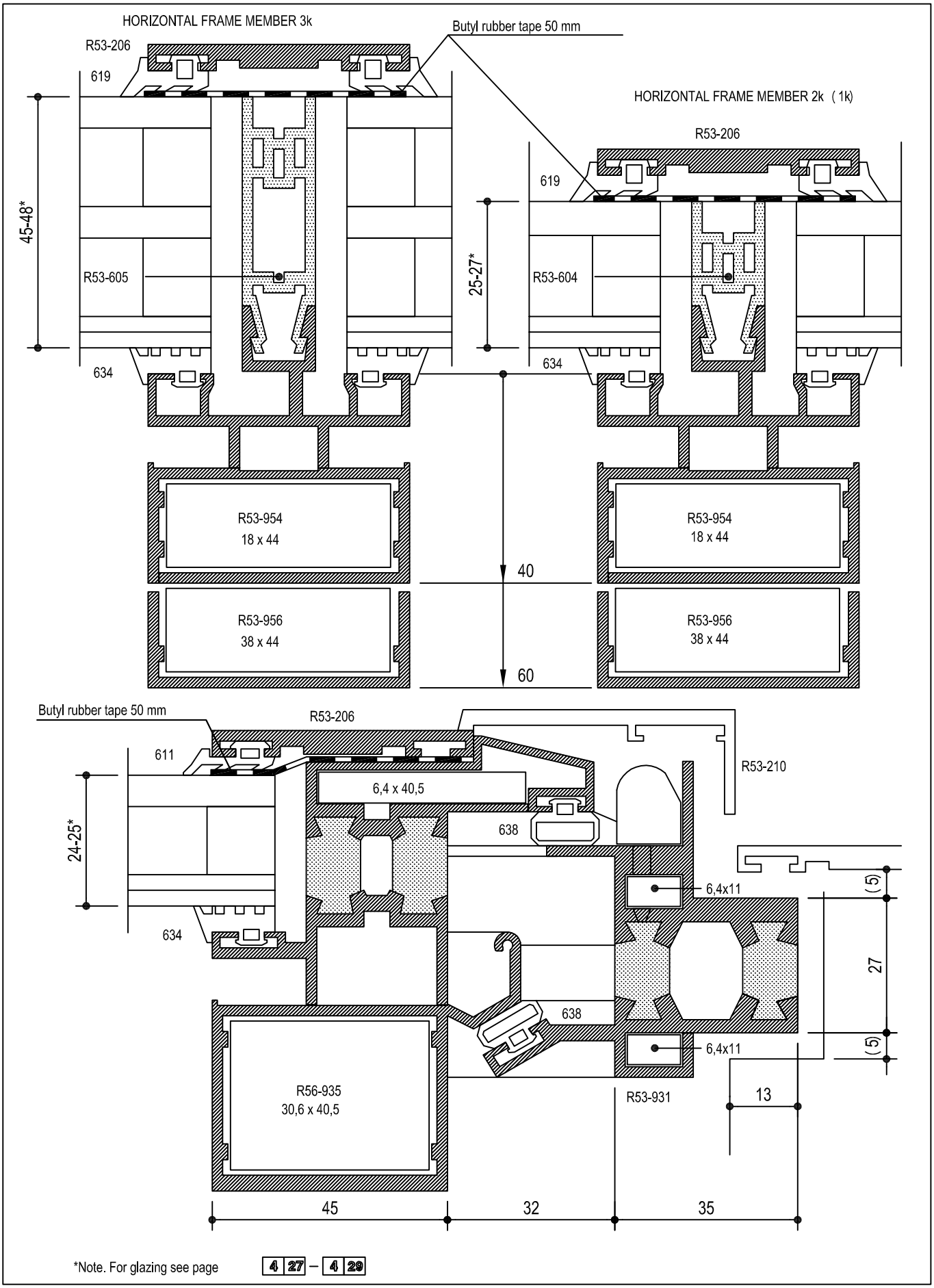
R53-733

Use of cover beads





*Note. For glazing see page



*Note. For glazing see page 4 27 – 4 29

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Combinations 1:1

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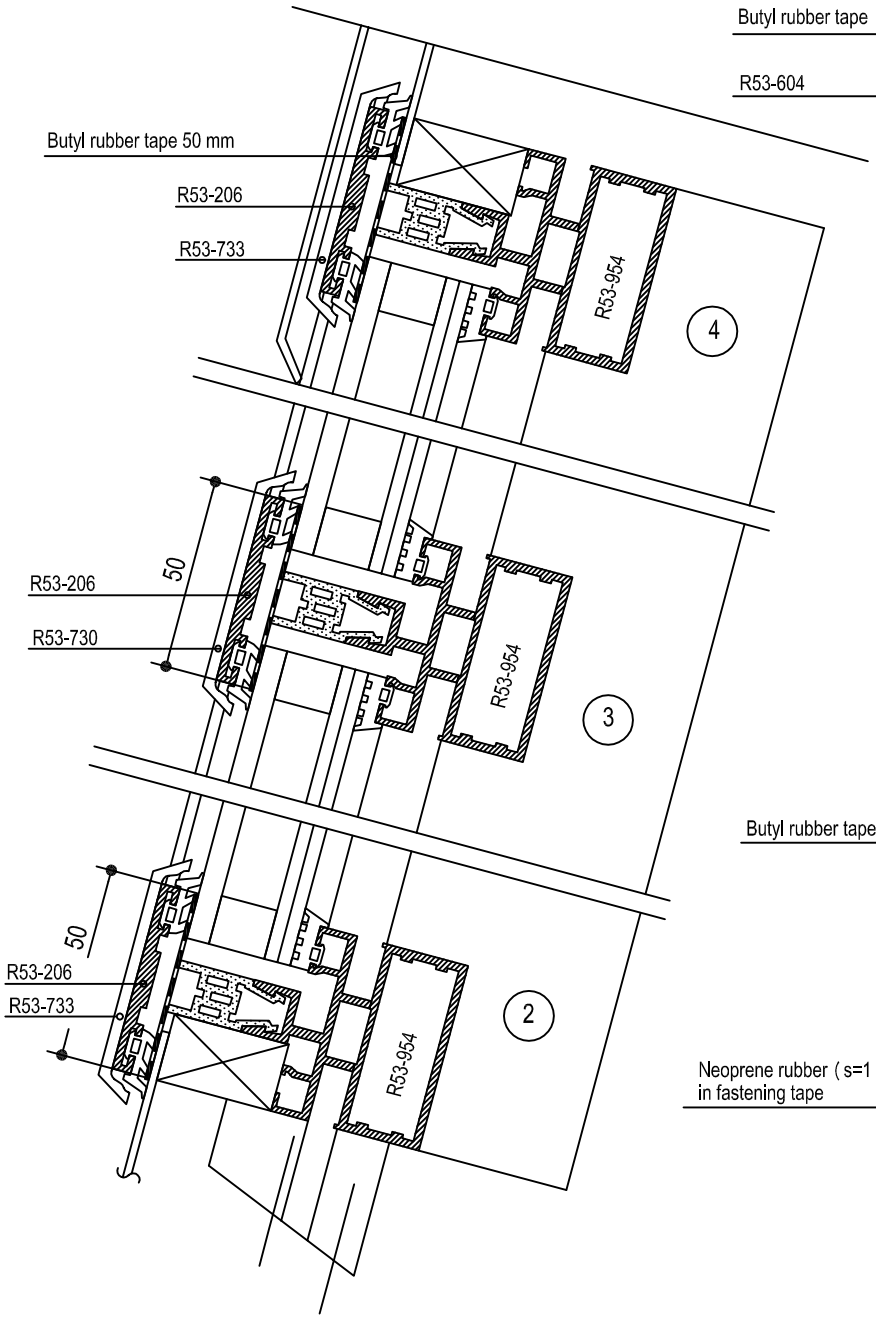
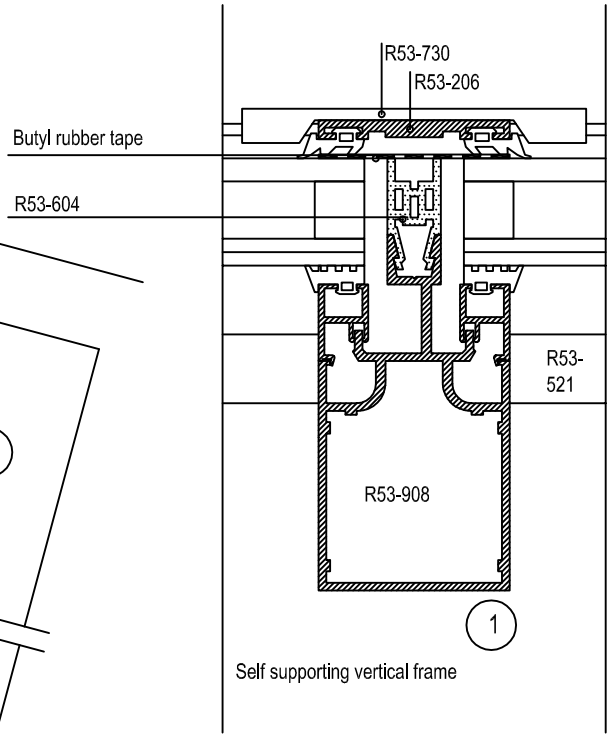
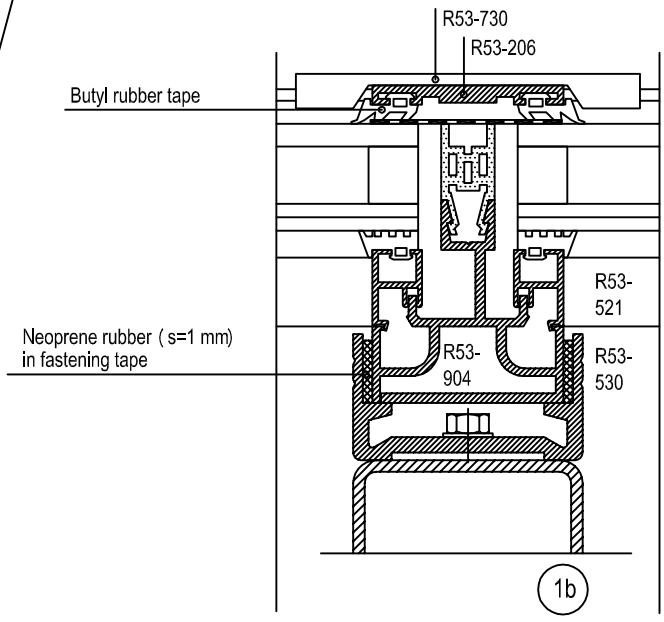
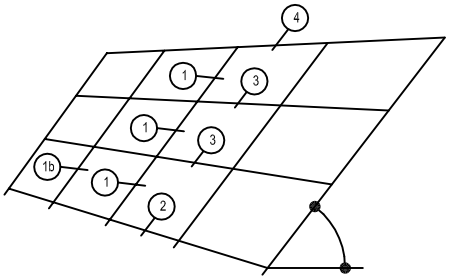




Self supporting vertical frame



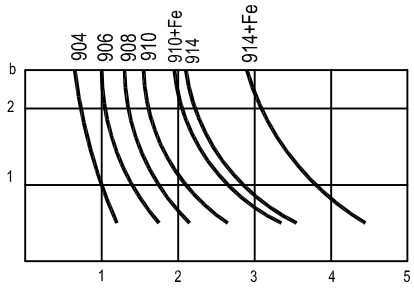
Vertical frame on separate frame



- Joining to building frame for example 4 30 – 4 31
- Condensing water drip groove must be in the lower edge of the window
- Ventilation of rebate must be from the outside

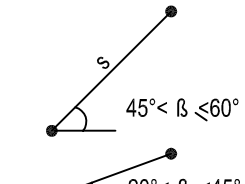
FRAME SIZING

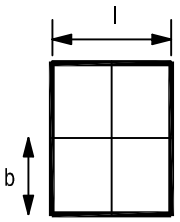
For sides divided with intermediate horizontal frames



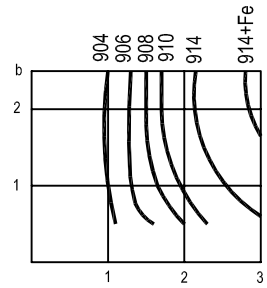
l (20°<ß≤45°)

s/ 2√(45°< ß≤60°)



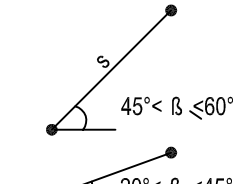


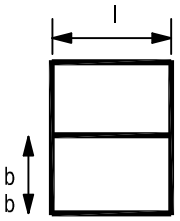
for sides divided into equal segments



l (20°≤ß≤45°)

s/√2 (45°< ß≤60°)

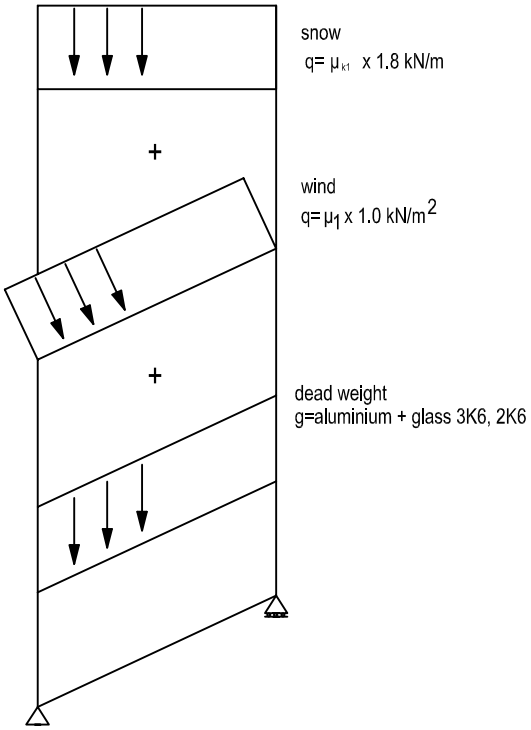




Maximum lenght of horizontal frame

Frame profile	roof slope ß	
	30°	45°
R53-954	1,20	1,40
R53-956	1,50	1,75

Rb 144



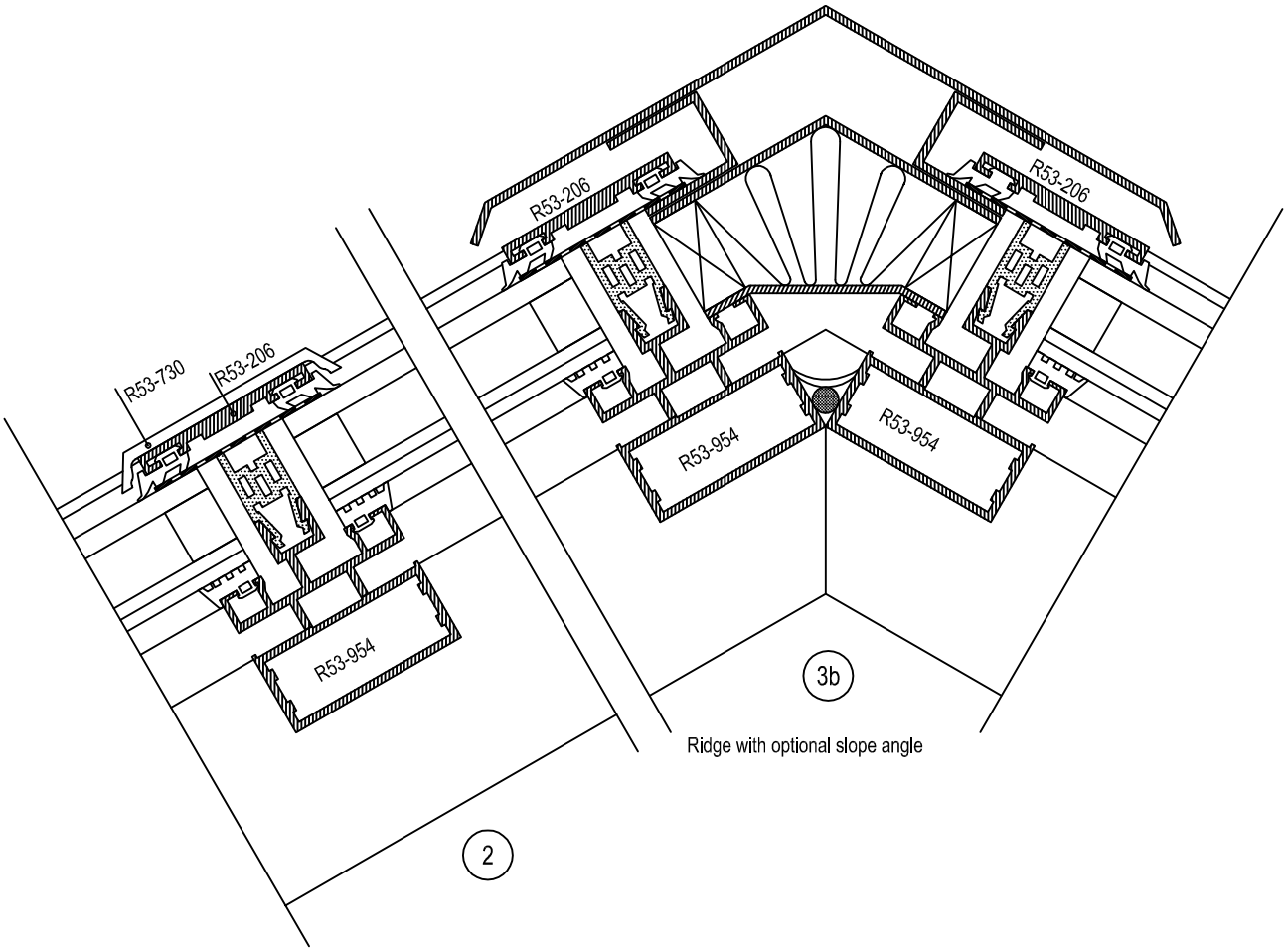
USE OF SIZING GRAPHS

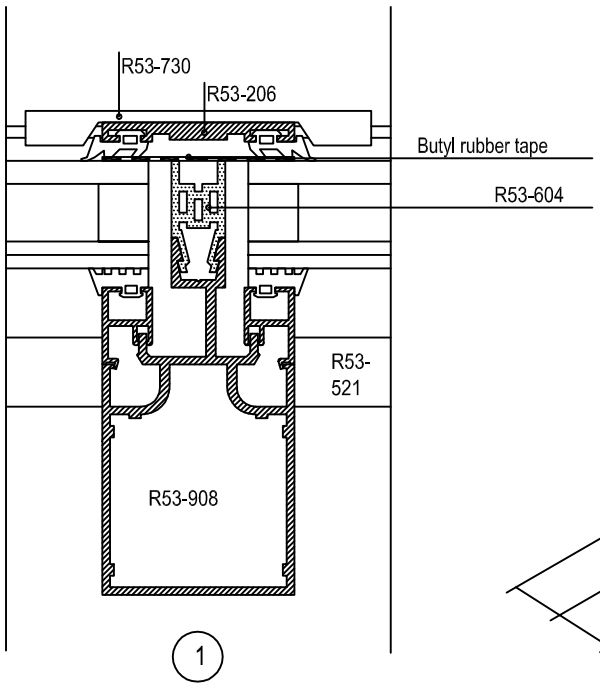
Graph curves are calculated according to the normal snow loads, wind loads and dead loads as set out in the loading codes of RIL 144.
Because the bending of the lengths of the glass panes is the measuring factor the graphs are different if the side is one segment (where benoing is under s/300) or if divided into several segments (bending under S/200) .
The graphs are valid for slopes of between 20°-45° where the horizontal span and the frame span determine the required profile.

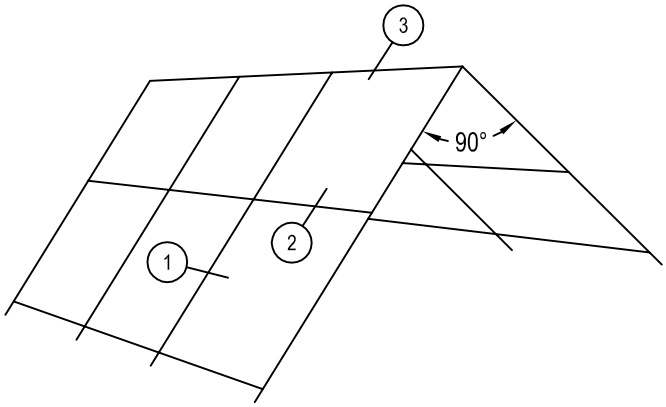
For example: Skylight window with a slope of 30°, span s=3,0 m, frame spacing l=2,6 m, vertical frame spacing b=1,2 m, triple glazing, sides divided into several parts; the graph gives the profile R53-914.

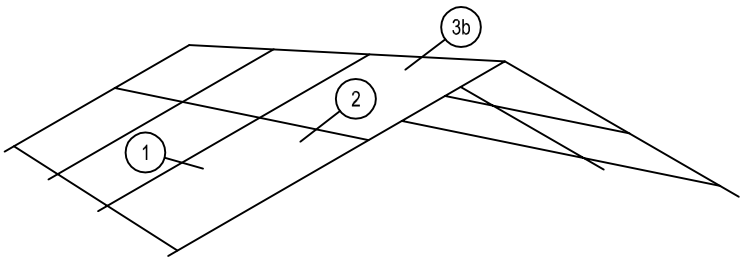
With slopes of between 20°-45° the degree of slope itself doesnt affect the choise of profile, sizing is done according to the horizontal span, and as the roof becomes more vertical the slads become smaller as the sides lengthen.
If the roof pitch is steeper than 45°, thent he previous statement will not apply. The same graphs can be used however for slopes of between 45°-60° when instead of the span a calculation taking the length of the slides multiplied the 2 is used. √
For slopes over 60° this method will result in a too heavy profile.

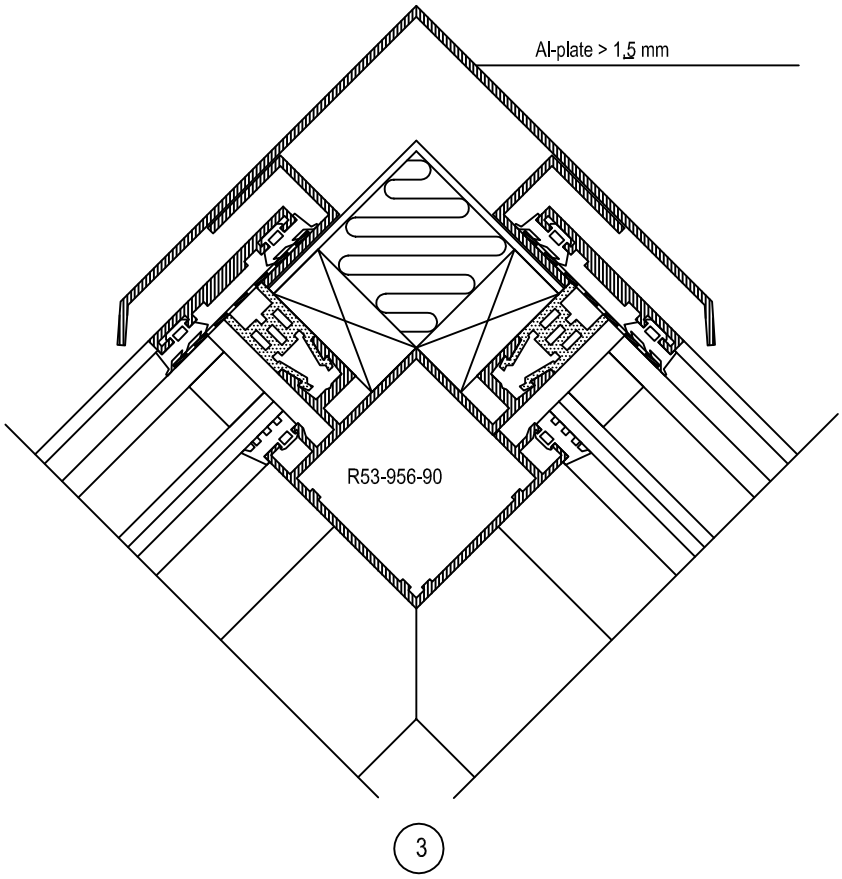
For example: Skylight window with a slope of 50°, span s=3,0 m, vertical window spacing b=0,9 m, Triple glazing, sides divided into parts; s 2=2,12 m, √
The graph gives the profile R53-910.



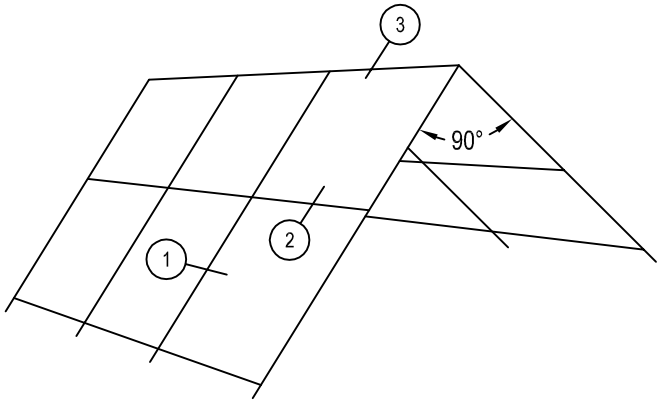








Ridge with 45° slope angle

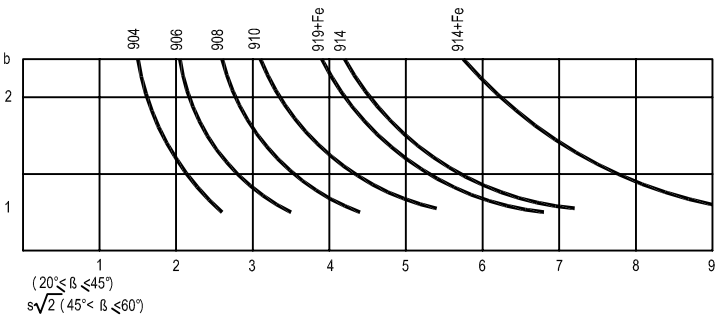


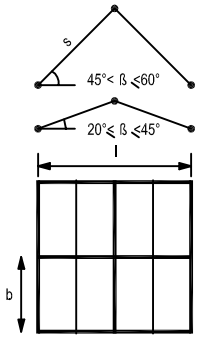
R53 VERTEX

Pitched roof, 1:2

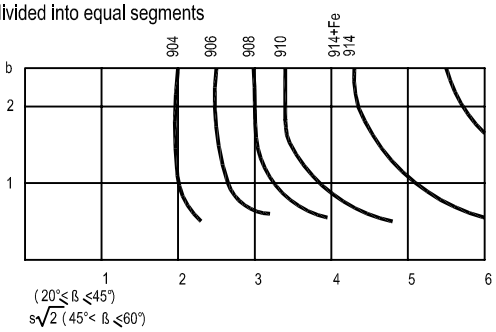
FRAME SIZING

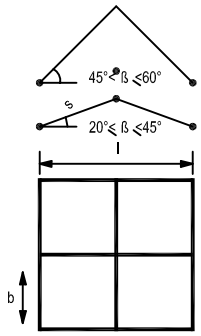
For sides divided with intermediate horizontal frames





For sides divided into equal segments





USE OF SIZING GRAPHS **ENG**

Graphs curves are calculated according to the normal snow loads, windloads and dead loads as set out in the loading codes of RIL 144.
Because the bending of the lengths of the glass panes is the measuring factor the graphs are different if the side is one segment (where benoing is under s/300) or if divided into several segments (bending under S/200) .
The graphs are valid for slopes of between 20°-45°, where the horizontal span and the frame span determine the required profile.

For example: A pitched roof with a slope of 30° span l = 5,0 m, frame spacing (glass panel width) b = 1,2 m, triple glazing, sides divided into several parts; The graphs gives two possible alternatives R53-914 or R53-910 using a 60x40x4 on the inside.

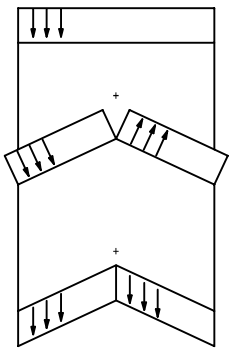
With slopes of between 20°-45° the degree of slope itself doesnt affect the choise of profile, sizing is done according to the horizontal span, and as the roof becomes more vertical the slads become smaller as the sides lengthen.
If the roof pitch is steeper than 45°, then the previous statement will not apply. The same graphs can be used however for slopes of between 45°-60° when instead of the span a calculation taking the length of the slides multiplied the $\sqrt{2}$ is used.
For slopes over 60° this method will result in a too heavy profile.

For example: A pitched roof with a slope of 50°, side length s=3,0 m, frame spacing b=0,9 m, triple glazing, side divided into segments; s x $\sqrt{2}$=4,24 m, the graph gives the profile R53-910.

Intermediate horizontal frame maximum lengths

Frame profile	roof slope	
	30°	45°
R53-954	1,20	1,40
R53-956	1,50	1,75

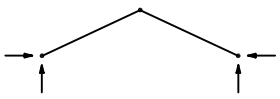
Loads RIL 144



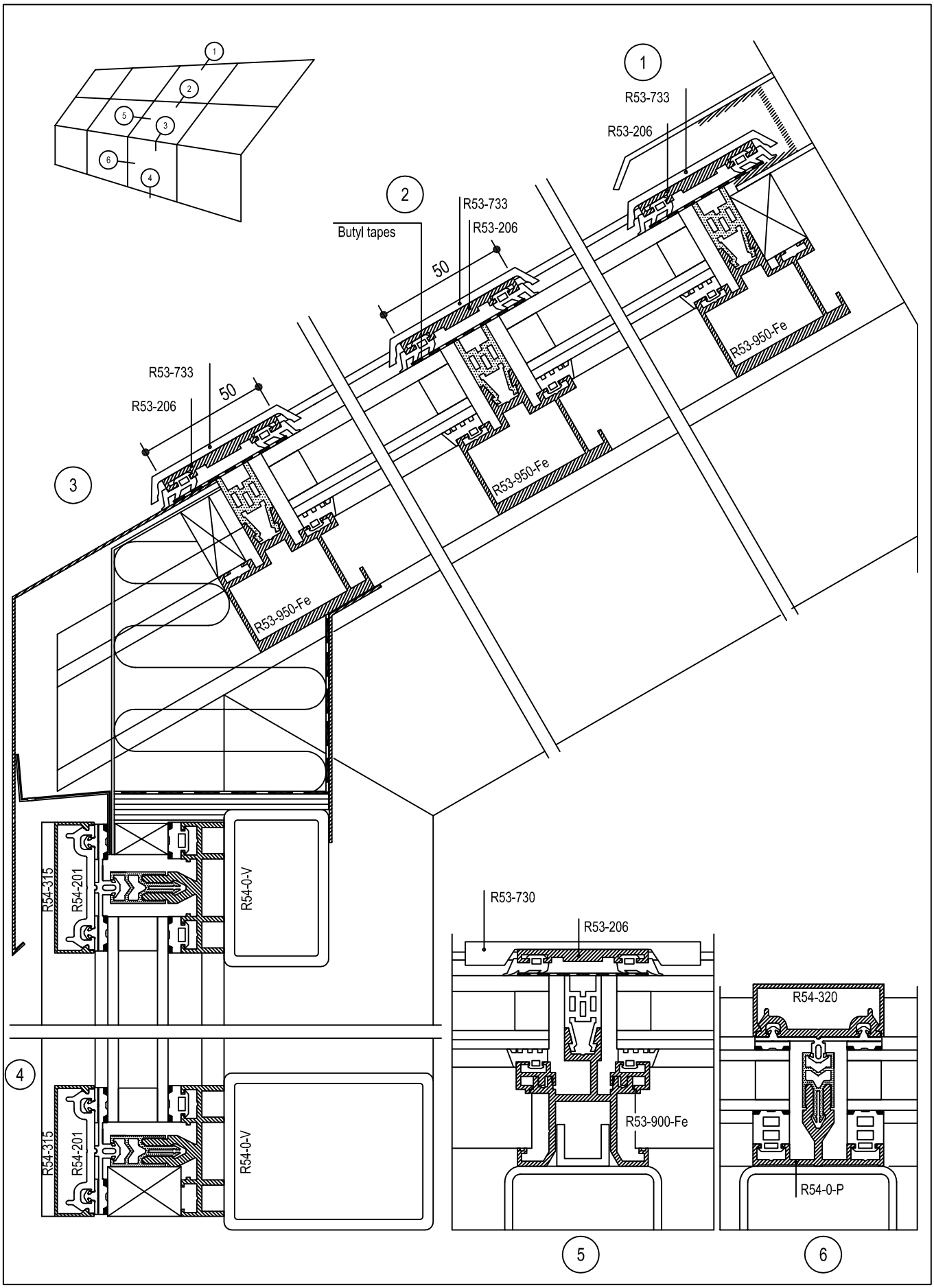
snow
$q = \mu_{k1} \times 1.8\ kN/m^2$

wind
$q = \mu_1 \times 1.0\ kN/m^2$

dead weight
g=aluminium+glass 3K6,2K6



3-joint framework



R53 VERTEX

Skylight R53-900-Fe and R53-950-Fe

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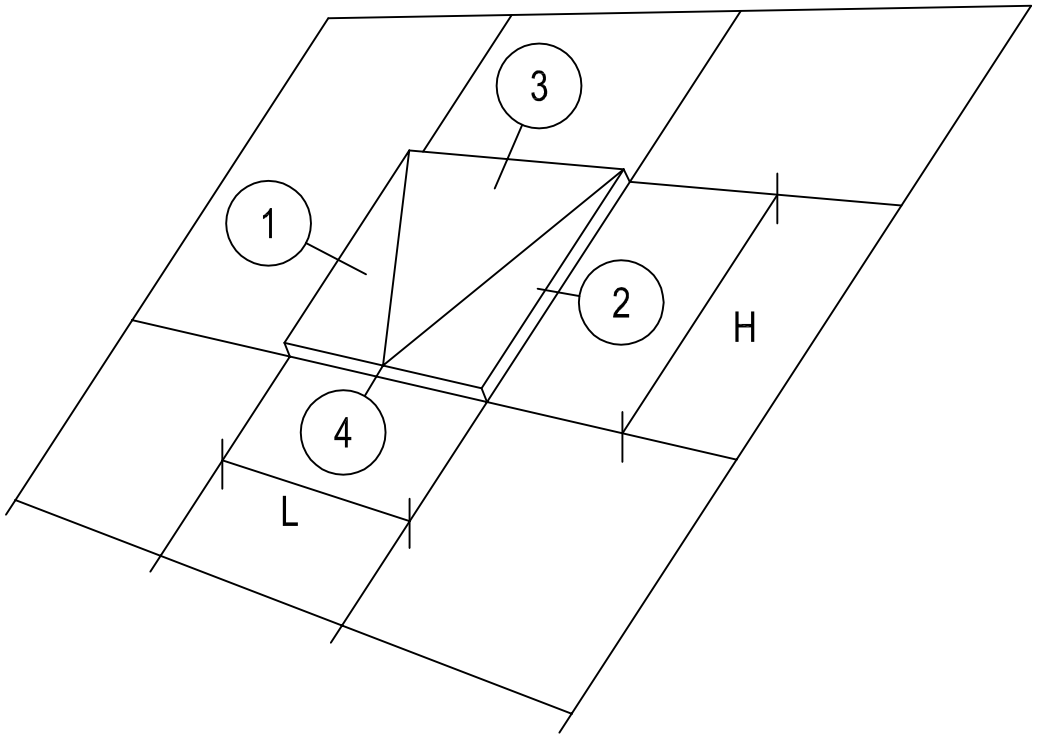
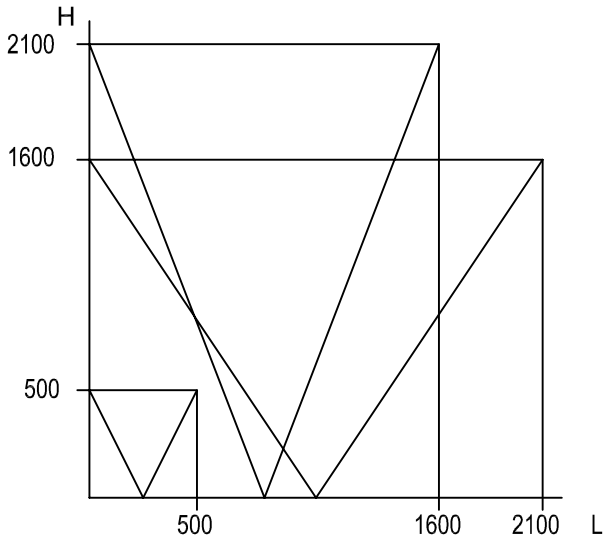
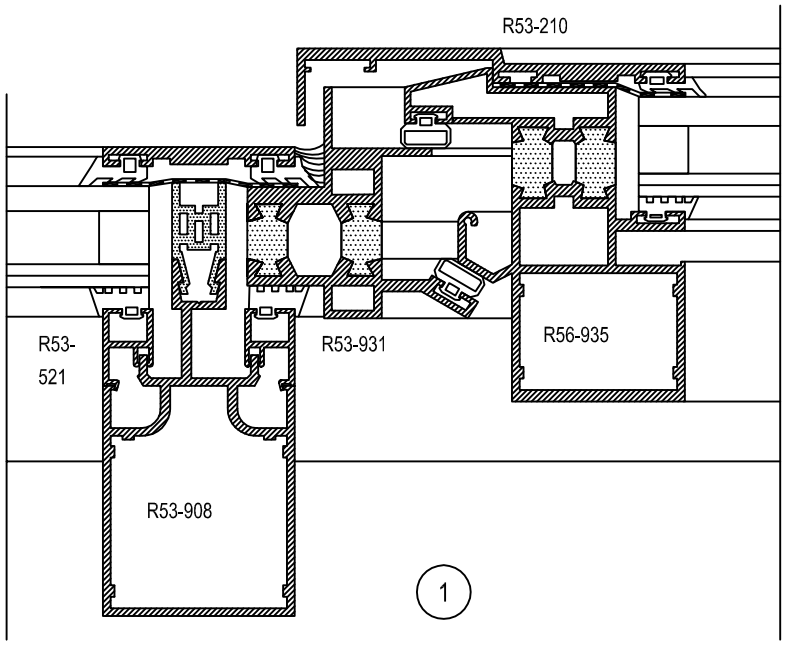
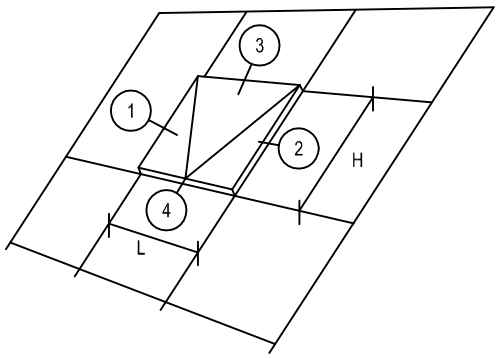
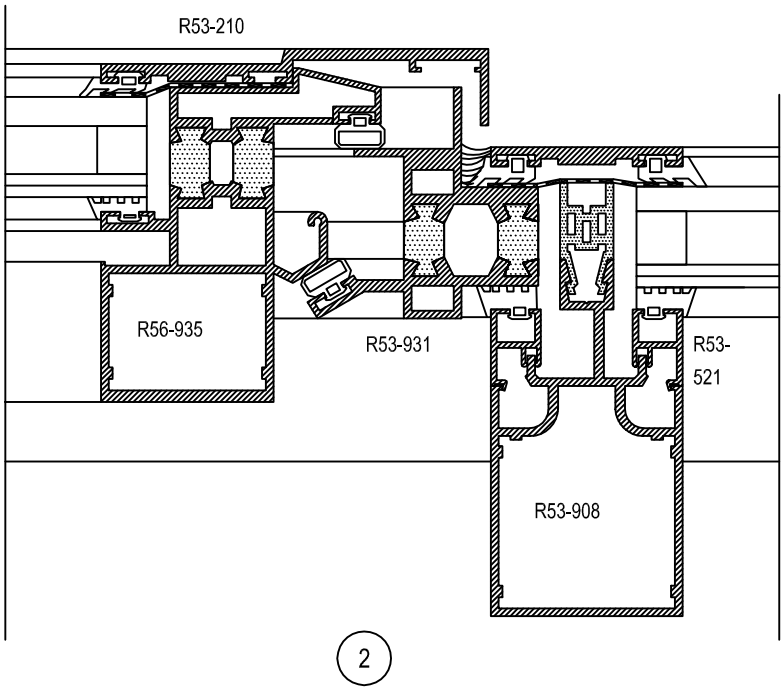


Maximum size of skylight window / minimum size (H/L)









Note
Working instructions is contained in special drawing

R53 VERTEX

Skylight roof window 1:2

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R53 VERTEX

Skylight roof window 1:2

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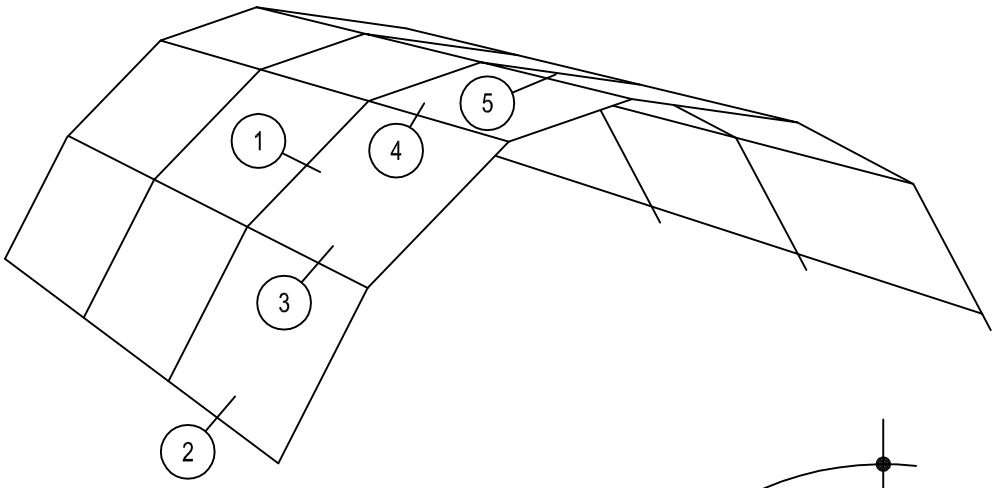

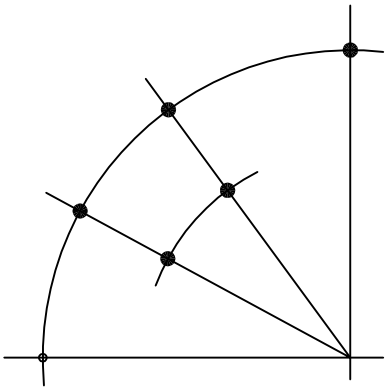

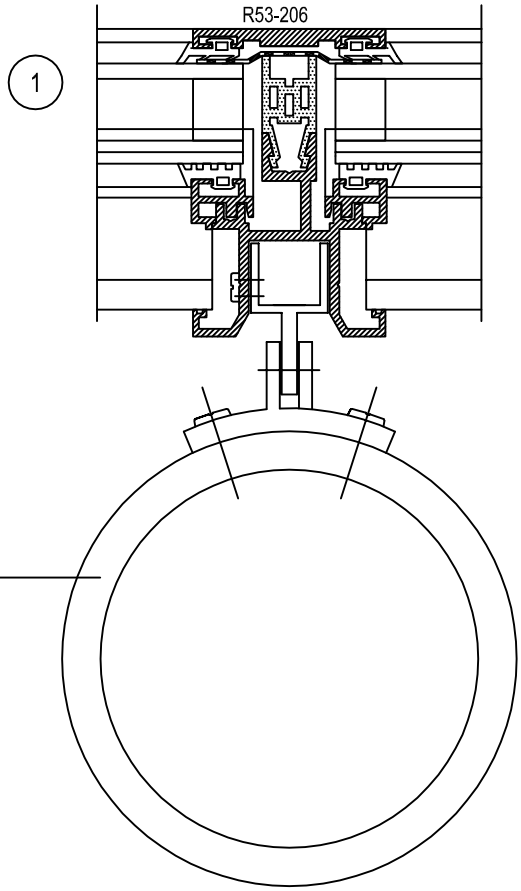

Steel structure:
According to structural engineers instructions
Glazing: See glazing instructions p. 4 16

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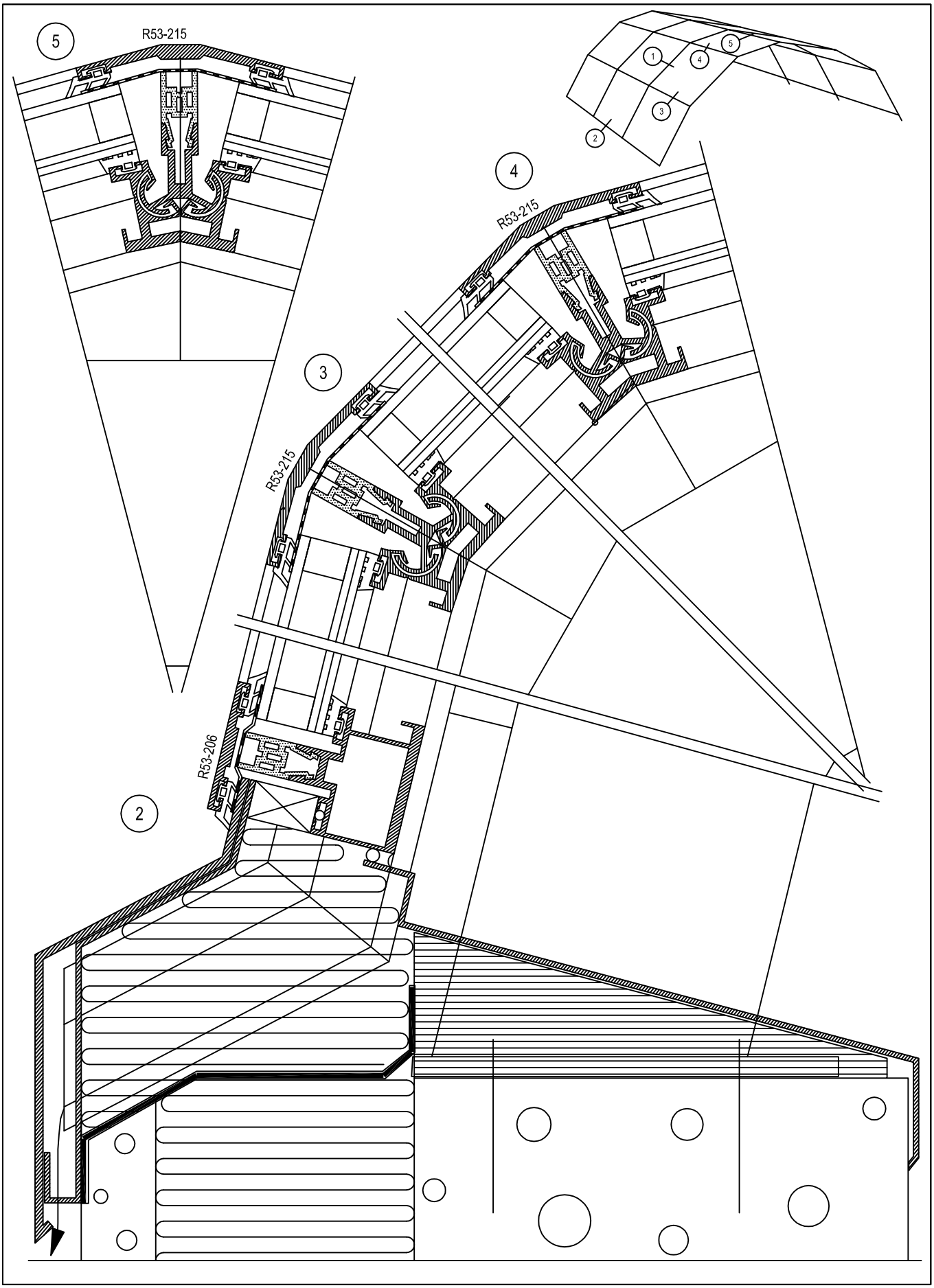
Barrel vault, 1:2



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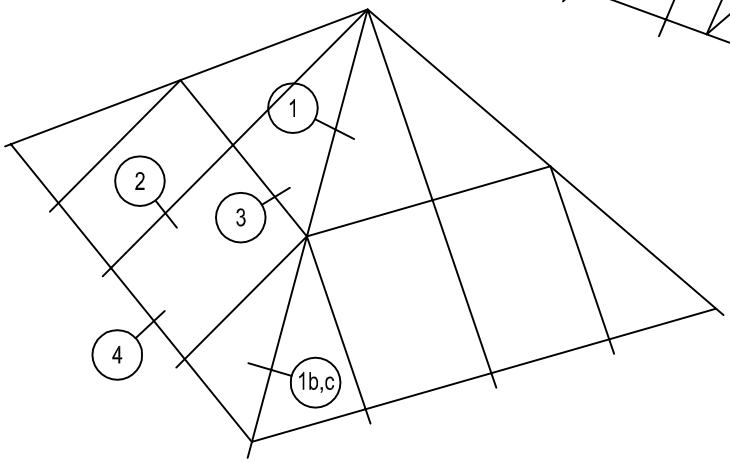
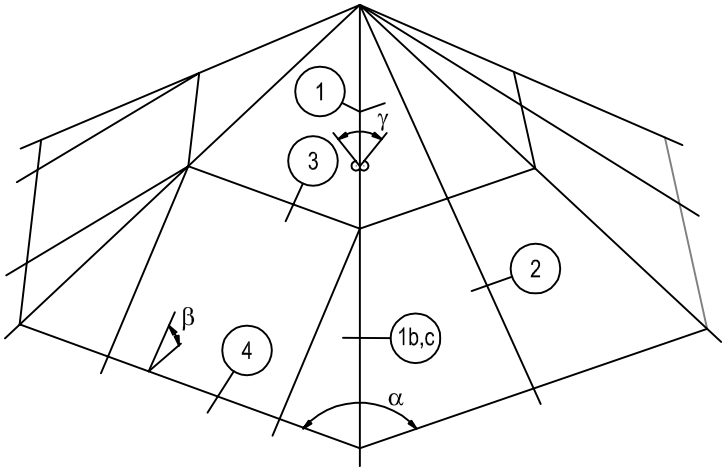
R53 VERTEX

Barrel vault, 1:2





GEOMETRY OF PYRAMID

The direction of the intermediate diedri angle can be determined from the formula:
$\cos\gamma = \cos^2\beta - \cos\alpha\sin^2\beta$

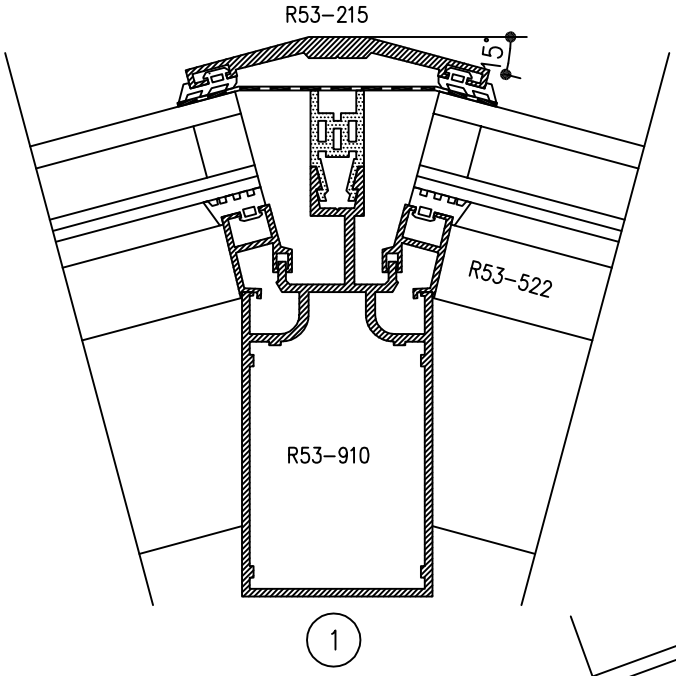
Because the glazing beads allow a small angle deviation between the glass and the frame, for the most common geometrical cases a glass bead combination be used.

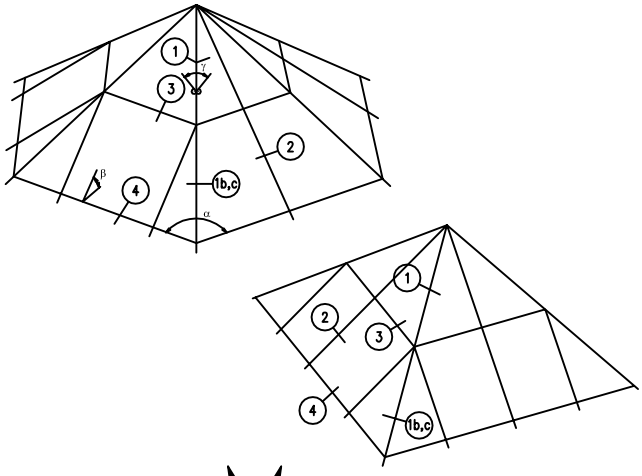
External:

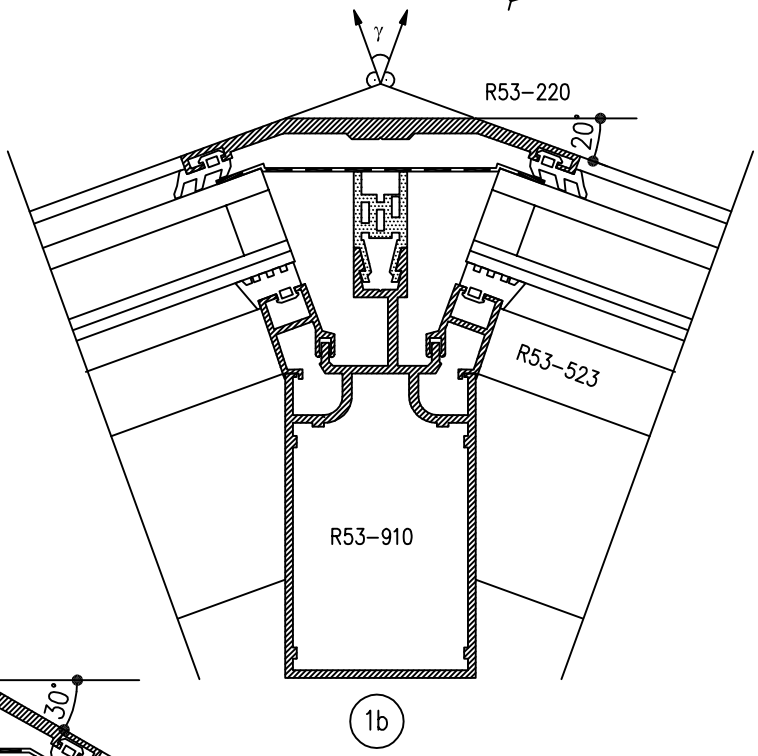
Roof slope ß				
Base	α	30°	45°	60°
4- sides	90°	R53-220	R53-230	
6- sides	120°	R53-215	R53-220	
8- sides	135°	R63-11363	R53-215	R53-220
12- sides	150°		R53-11363	R53-215

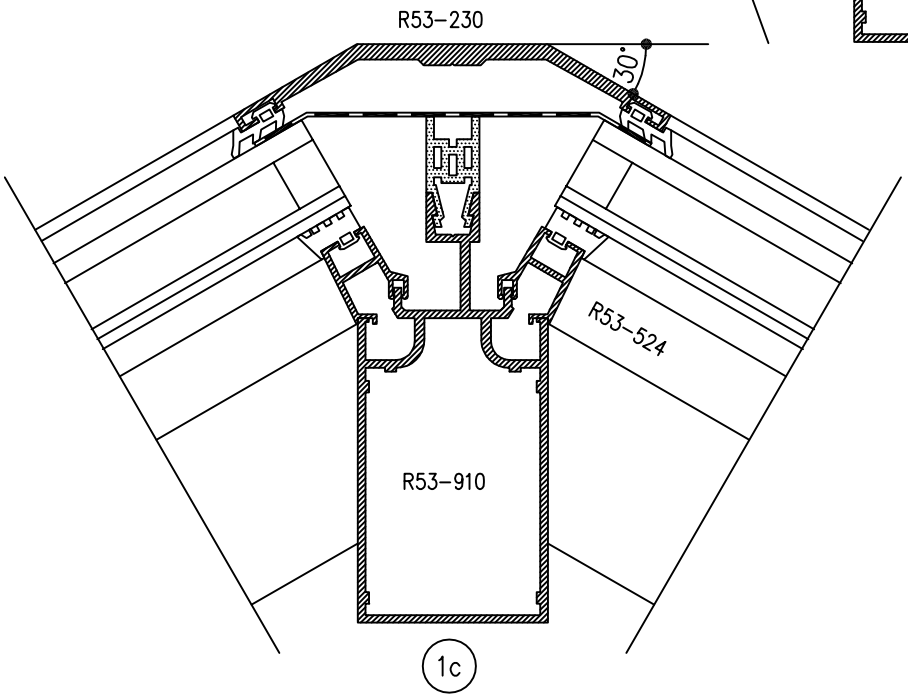
Internal:

Roof slope ß				
Base	α	30°	45°	60°
4- sides	90°	R53-523	R53-524	
6- sides	120°	R53-522	R53-523	
8- sides	135°		R53-522	R53-523
12- sides	150°			R53-522



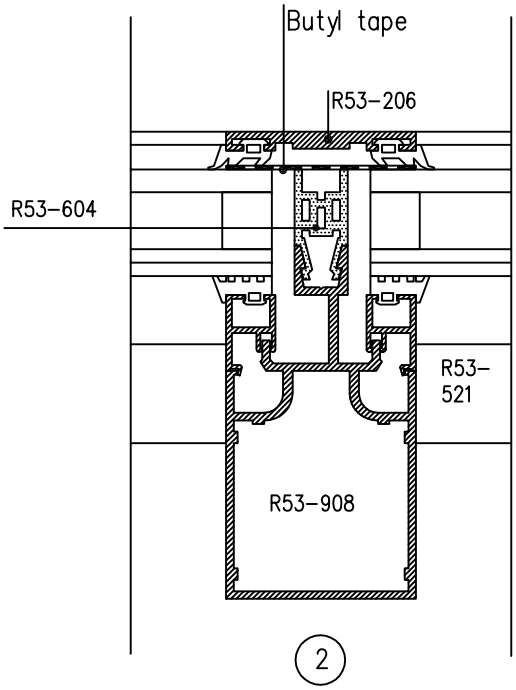


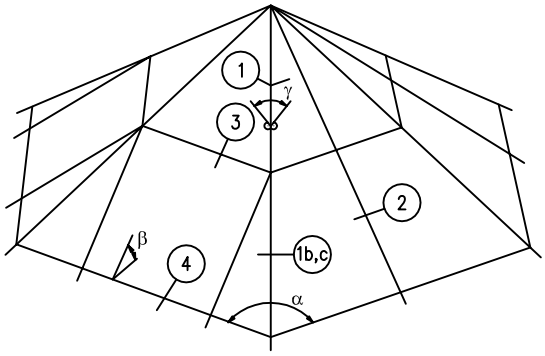


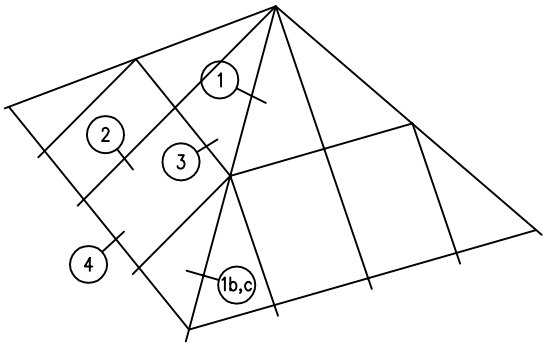


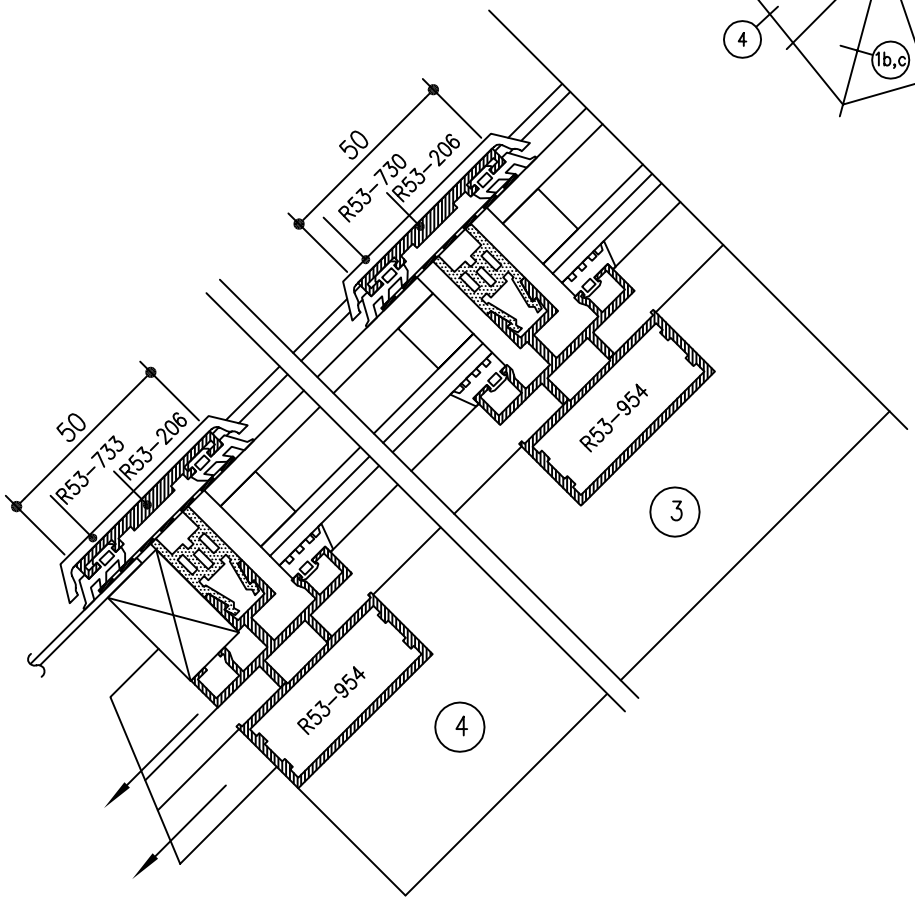
R53 VERTEX

Pyramid, 1:2









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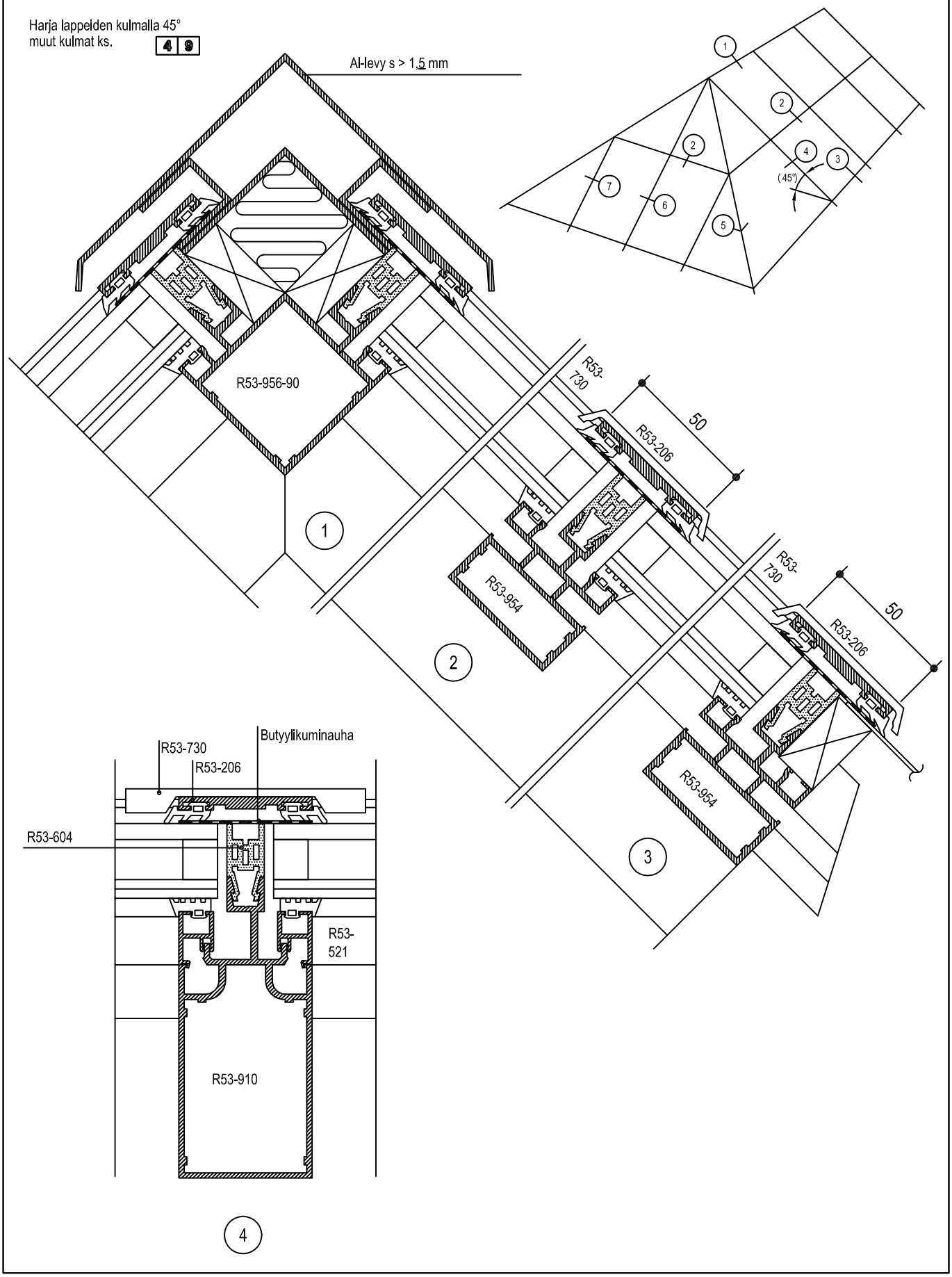
Pyramid, 1:2



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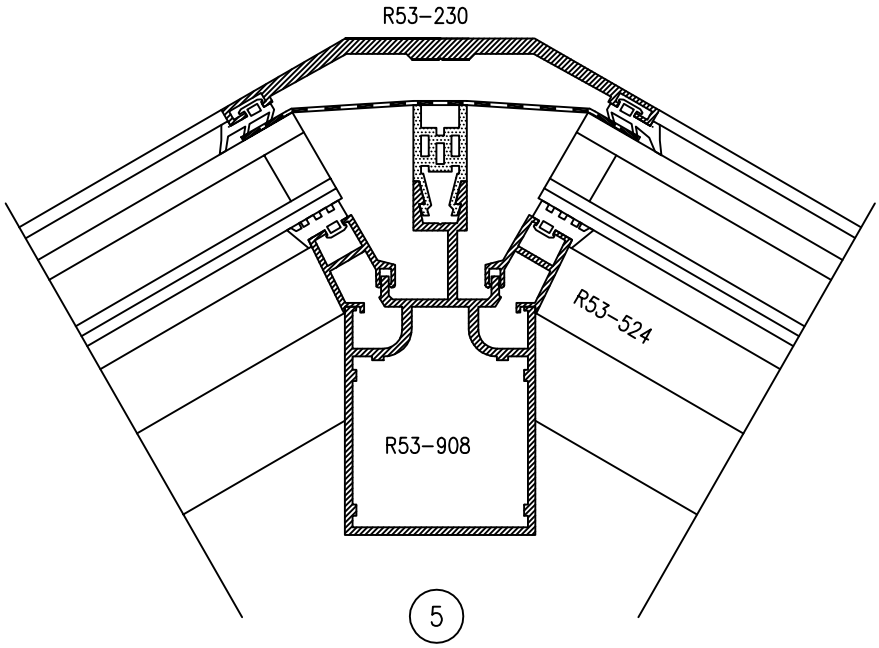
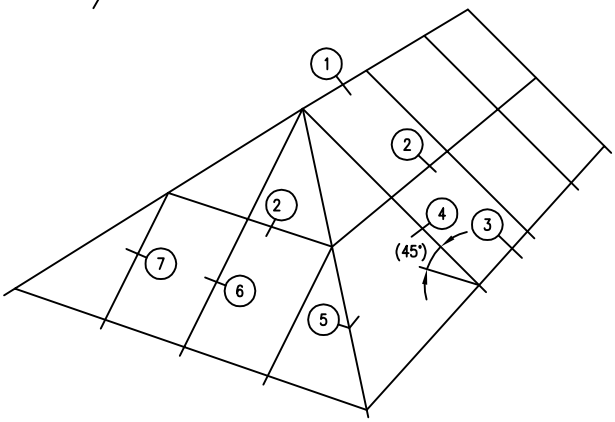
R53 VERTEX

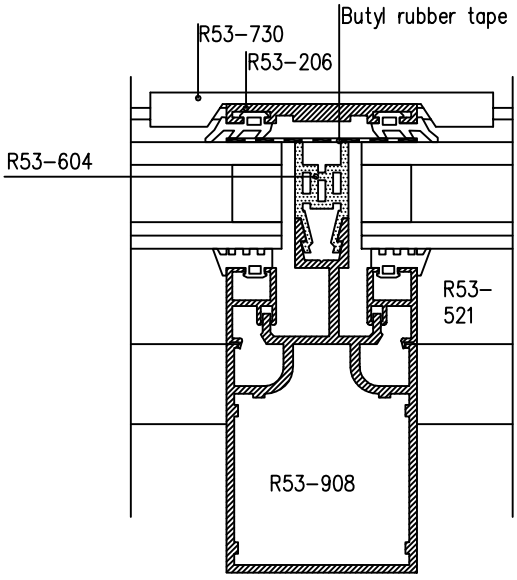
Aumakatto, 1:2



5

Angel edge with 45° slope angle





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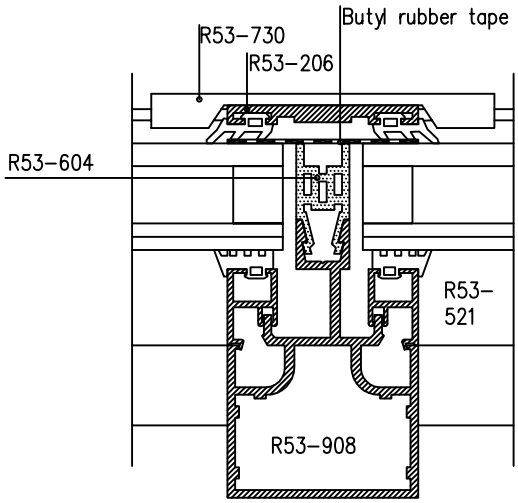

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R53 VERTEX

Hip roof, 1:2

NOKIAN PROFILES

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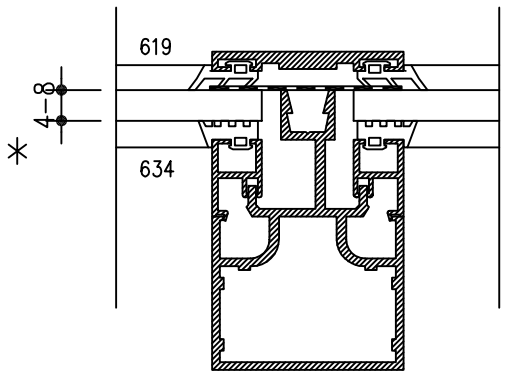
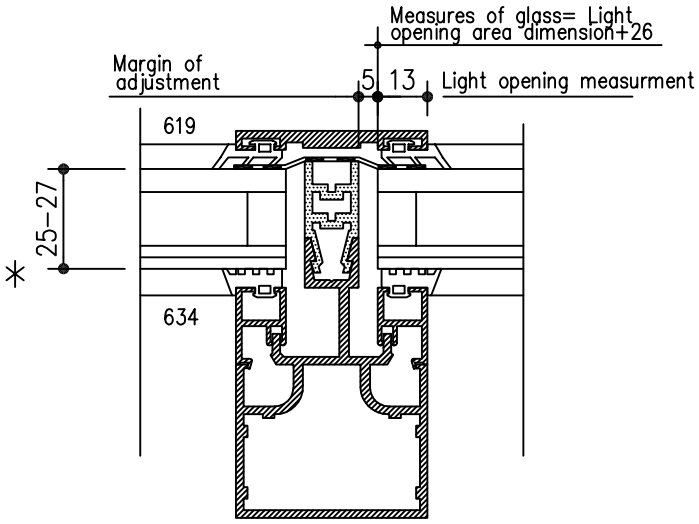
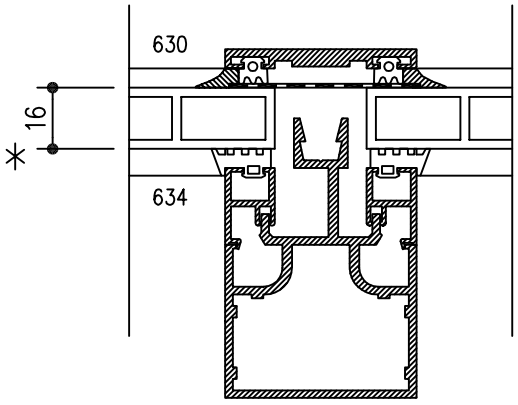


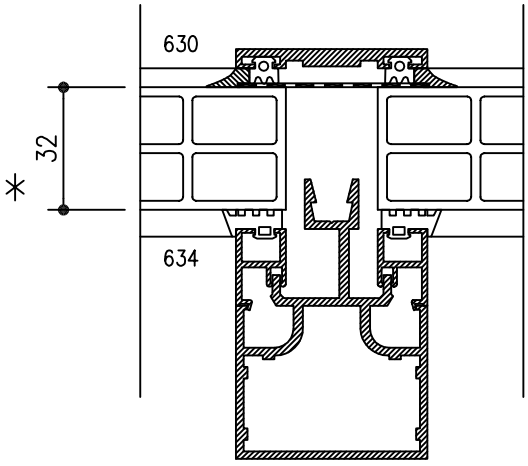
Single glazing



double glazing



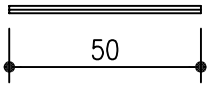
Acrylic 2k

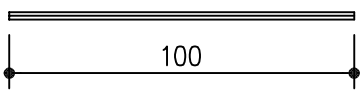


Acrylic 3k

Sealing gaskets

Butyl rubber plate

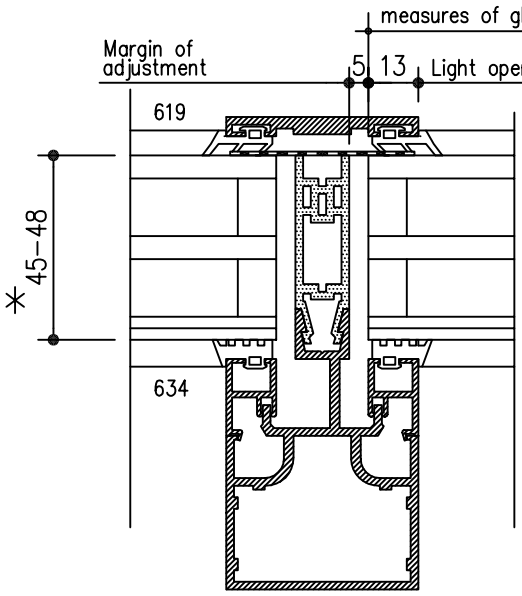




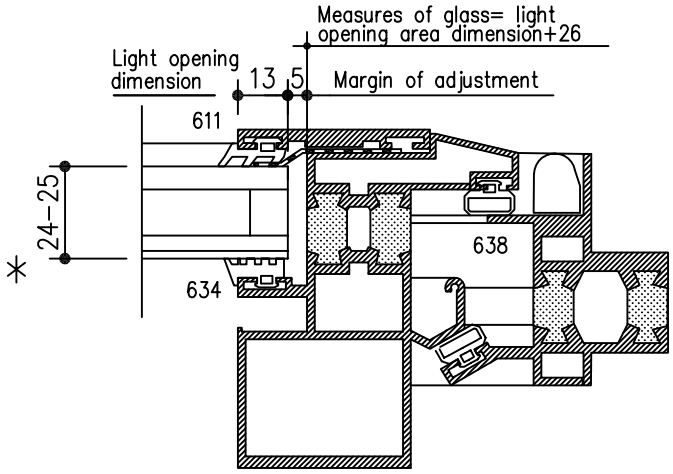
Note. use of Butyl rubber plate is necessary in all skylight roof structures

✳ Note. minimum thicknesses of glass units.
These thicknesses cannot be reduced further

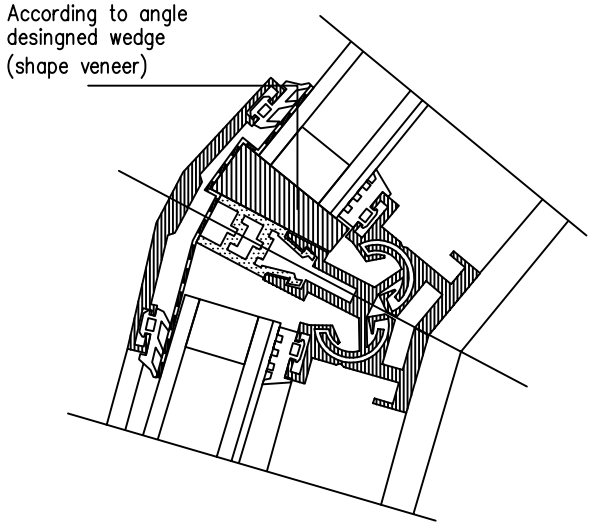
Note. The rigidity of the glass must defined in cooperation with glass manufacturer.

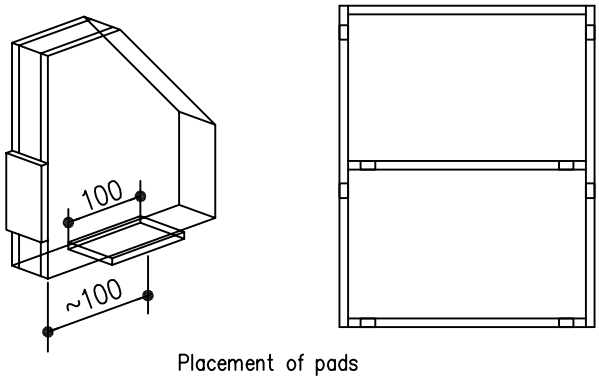


triple glazed unit



Openable skylight window, double glazed unit





Placement of pads

✳ Note. minimum thicknesses of glass units.
These thicknesses cannot be reduced further

Note. The rigidity of the glass must defined in cooperation with glass manufacturer.

INSTALLATION ENG

Great care must be used when installing glass and thermally insulated glass onto roofs. The installation base must be completely straight and the contact pressure with the glass must be good. The sealing materials used in the installation must be compatible whit each other and must not create any adverse chemical reactions. Care must be used with the edges of the glass, since damaged edges have a major impact on the have a major impact on the its durability.
The glazing bead profiles are attached with a steady force, using for instance a torque wrench, commencing.
When commencing glazing, make sure that the rebates, glazing beads and glass surfaces are clean.
Condensation and drain-off water grooves must be clean and openand the thickness of the glass must must be correct.
Sealing tape 643 is set into place and the corners are secured with an elastic compound. When cutting the sealing tape, it must be kept in mind that there is a possibility of 5 mm/m longitudinal shrinkage.

Glass installation

The purpose of the pads is to support, centre and carry the sealed glass or similar in the frame in the intended manner. With the bearing pads, the weight of the glass is partially shifted to the frame structure. Ensure that the pads remain in place. The bearing pads must be made of a shape-retaining and durable plastic with a hardness of 70-90° Shore A, or another suitable material for the purpose.
Pads made of other materials must be of an equal hardness. Disjointable or corrugated pad cannot be used.

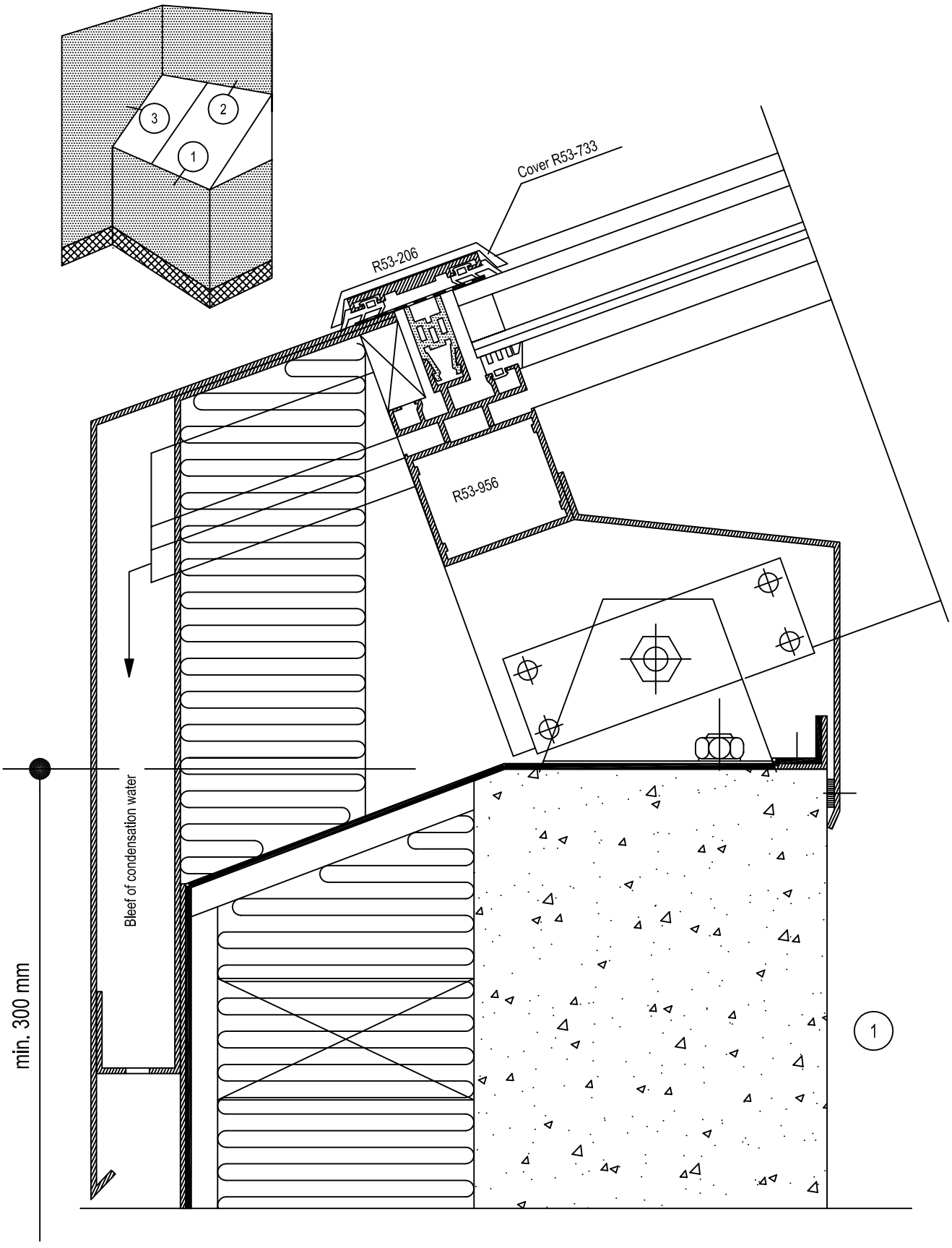
The temperature fluctuations that the R53 VERTEX structures may be susceptible to must not effect the hardness of the pads. The length of the bearing must be 100 mm, and the width must be 4 mm wider than the thickness of the glass pane.
The thickness of the bearing pads is 5 mm. A pad must also be under the outermost glass. The length of the support pads can be 50...100 mm depending on size of glass pane, and the width of the pad can be same as the width of the bearing pad. It must be ensured that the supporting pads remain in place.
The bearing and supporting pads must not block the the run-off water grooves at any point. The pads are installed 100 mm from the corner of the pane (measured to the center of the pad).

Instead of heat-insulating profile under the pads of heavy glass, it is recommended to use a piece (approx. 200 mm long) of the R53-520 profile. In triplex-structure is wedge R53-603 is used.
These glazing introductions are in principal only. We accept no responsibility for actual glazing work that we are not personally supervising.
The EPDM sealing compound tape we supply is very heat and age-resistant. We are not responsible for the sealing compound materials. The thickness and types of glass must be specified separately with the glass manufacturer. Special instructions, e.g. RIL 198, Light permeable structures. Note the thickness of the glazing units. Roof glazing instructions are valid for scopes 15-75°. Transparent structures of 75-90° are classed as window structures.

How to glaze R53 VERTEX-profiles
Rectangular roof and oblique angled applications

- ☐ Ensure that condensation and leakage grooves are clean
- ☐ Ensure that the frame structure joints have been done in accordance with Nordic Aluminium's instructions (workshop file)
- ☐ Make sure that the corners of the T-joint are sealed; there must not be any putty in the leakage or condensation grooves, only and especially in the places where it is specified (work shop file).
- ☐ Mount interior vertical glazing profiles R53-52X into place.
- ☐ Mount interior glazing sealing gasket 643 into place; putty the corners with the elastic compound recommended by glass manufacturer.
- ☐ Set glazing pads into place, 100 mm from the edge of the glass to the centre of the pad. Pads must not block leakage water grooves. Use elastic compound to ensure that the wedges remain in place.
  -THE USE OF A DISJOINTABLE OR CORRUGATED PADS IS STRICTLY FORBIDDEN.
  Under heavy glass, it is recommended to use 200 mm long pieces of profile R53-520 at the pad position (double structure), triplex structure R53-603.
  -Asymmetrical pads (e.g. in barrel vaults) shaped from weather-resistant formwork plywood.
- ☐ The thickness of the glass must be measured in accordance with Nordic Aluminium's instructions; glass thickness 4-8 mm in simplex structures, 25-27 mm in duplex structures, and 45-48 mm in triplex structures. THESE THICKNESSES ARE MINIMUM.
  -The manufacturer must determine the correct (e.g. RIL 193-1993) thicknesses of individual glass elements included in sealed glass units in each instance.
- ☐ Lift the glass to the light opening area and centre it in the opening using the supporting pads.
- ☐ Install butyl tape into place (e.g. using a rubber roller).
- ☐ The surface of the glass must be absolutely dry and clean to ensure that the butyl adheres.
- ☐ The adherence of the butyl tape and the success of the glazing cannot be quaranteed in temperatures lower than 0° C.
- ☐ Pull the butyl tapes at the X- and T-joints over each other to ensure the corners are sealed.
- ☐ Install the glazing sealing gasket to the exterior glazing bead R53-2XX.
- ☐ The sealing tape must not be stretched when applying it; remember that there is a longitudinal shrinkage possibility of approx. 5 mm/m.
- ☐ Cut the sealing tape at a slant to prevent overlapping of the sealing "legs".
- ☐ First mount the vertical glazing bead profiles into place.
- ☐ Open the holes in the butyl tape at the glazing bead screw positions to prevent rotation of butyl tape around glazing screws.
- ☐ Attach the glazing bead stainless special anchoring screws in sequence starting from the end of the profile to ensure the seal.
- ☐ Mount the vertical glazing profiles into place in the same manner.
- ☐ Seal the joints of the glazing beads with elastic compound and install cover piece R53-7XX into place according to instructions.
- ☐ Extreme caution must be used when glazing so that the structure is definitely sealed.
- ☐ Perform the work in the proper sequence to prevent unnecessary stoppages.
- ☐ The special RT card instructions for glazing must be followed
- ☐ Additional information is available from Nordic Aluminium

As the glazier, you are ultimately responsible for the functionality of the structure.



SPECIAL ATTENTION must be paid to joints between building frame and skylight roof

R53 VERTEX

NOKIAN PROFILES

05.01.2012

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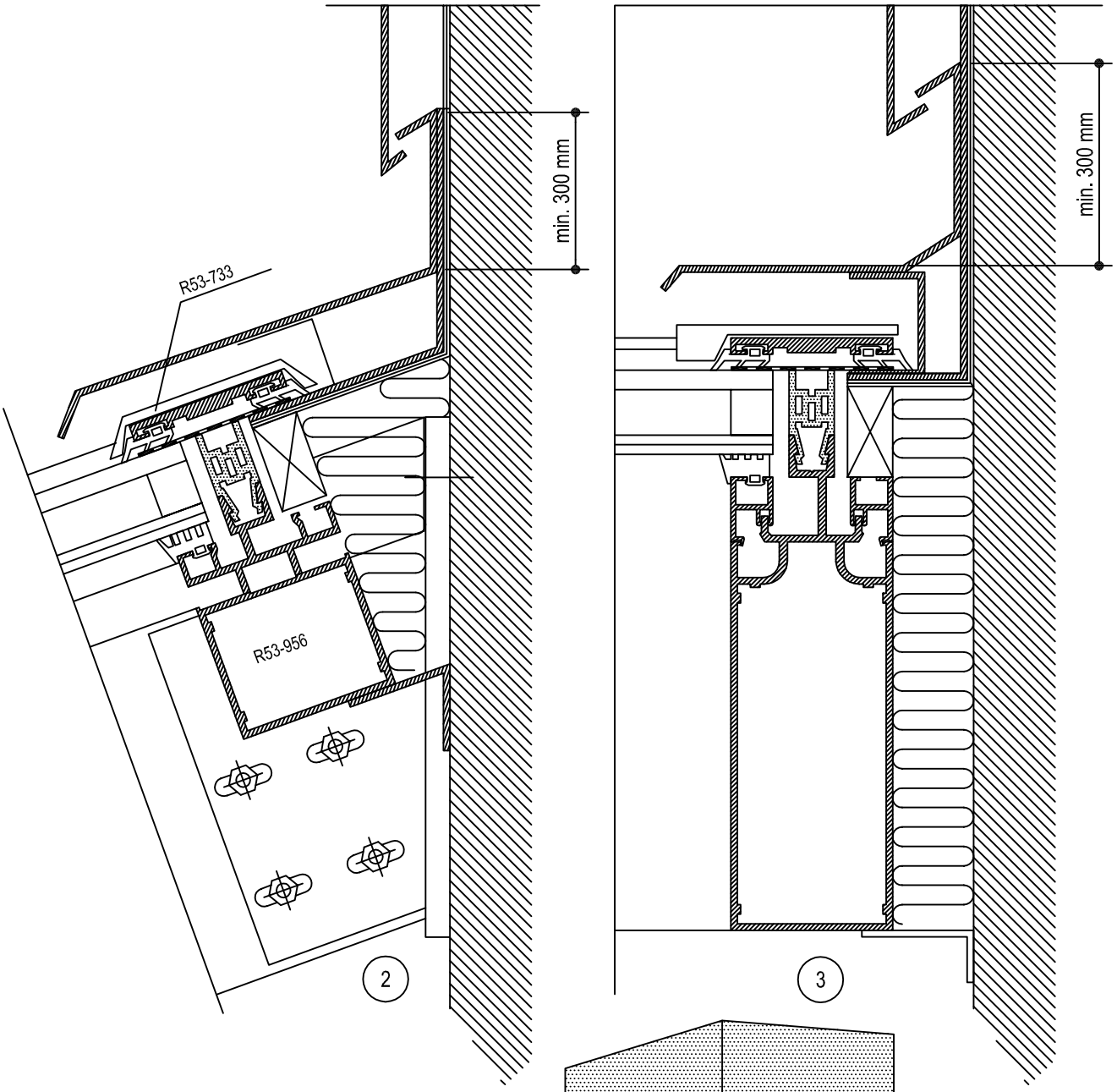
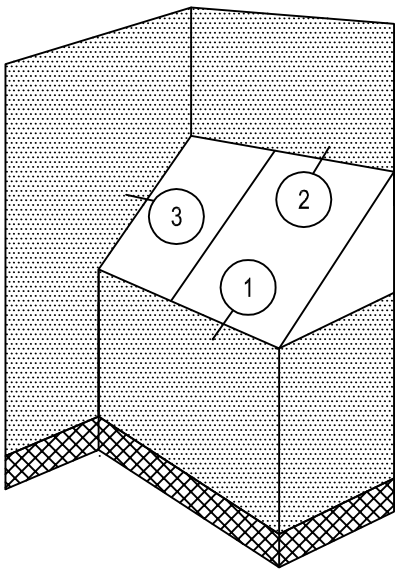
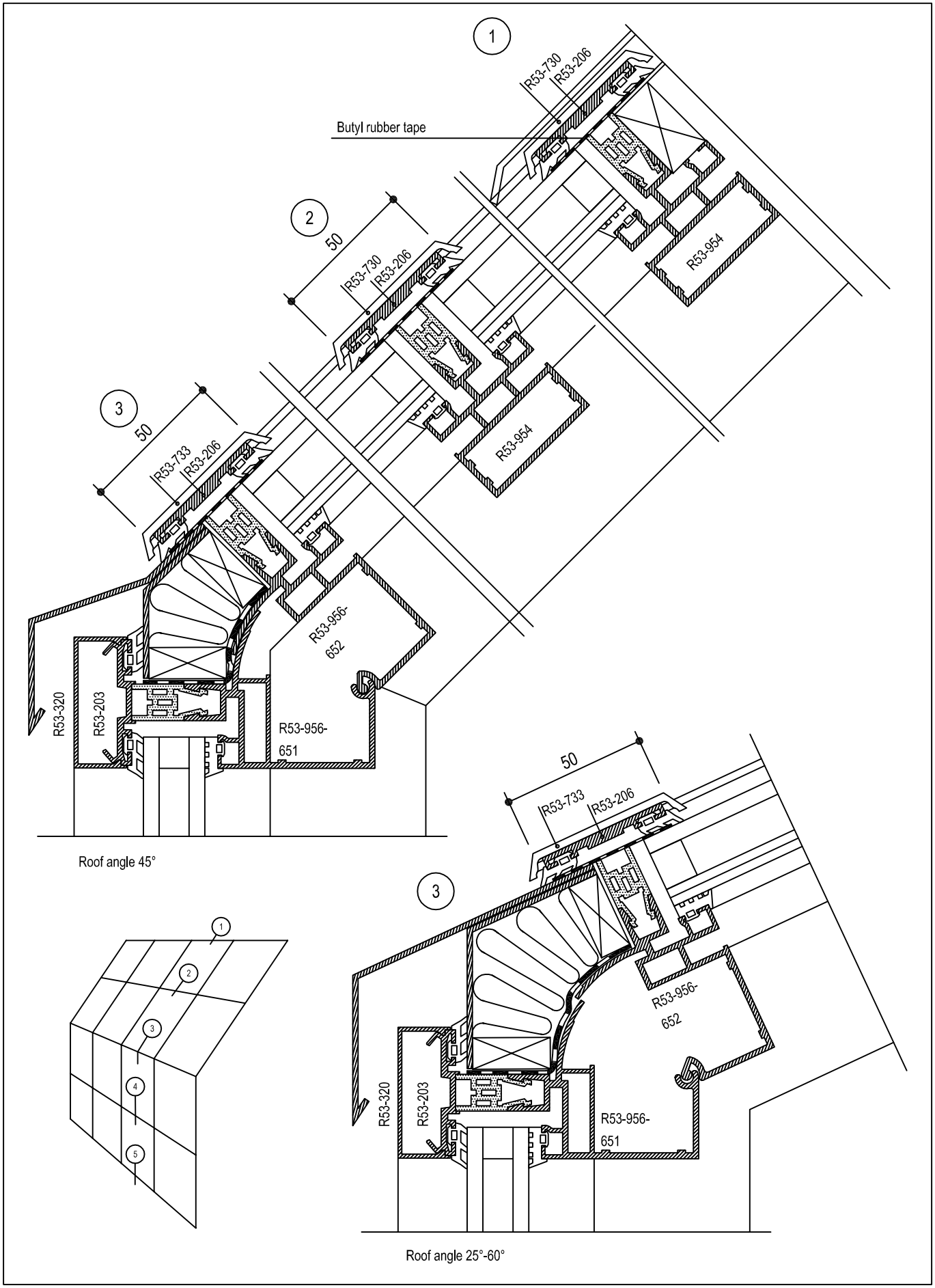
Joining to building frame details 1:2





SPECIAL ATTENTION must be paid to joints between building frame and skylight roof



R53 VERTEX

Adjustable eaves profiles, 1:2

NOKIAN PROFILES

05.01.2012

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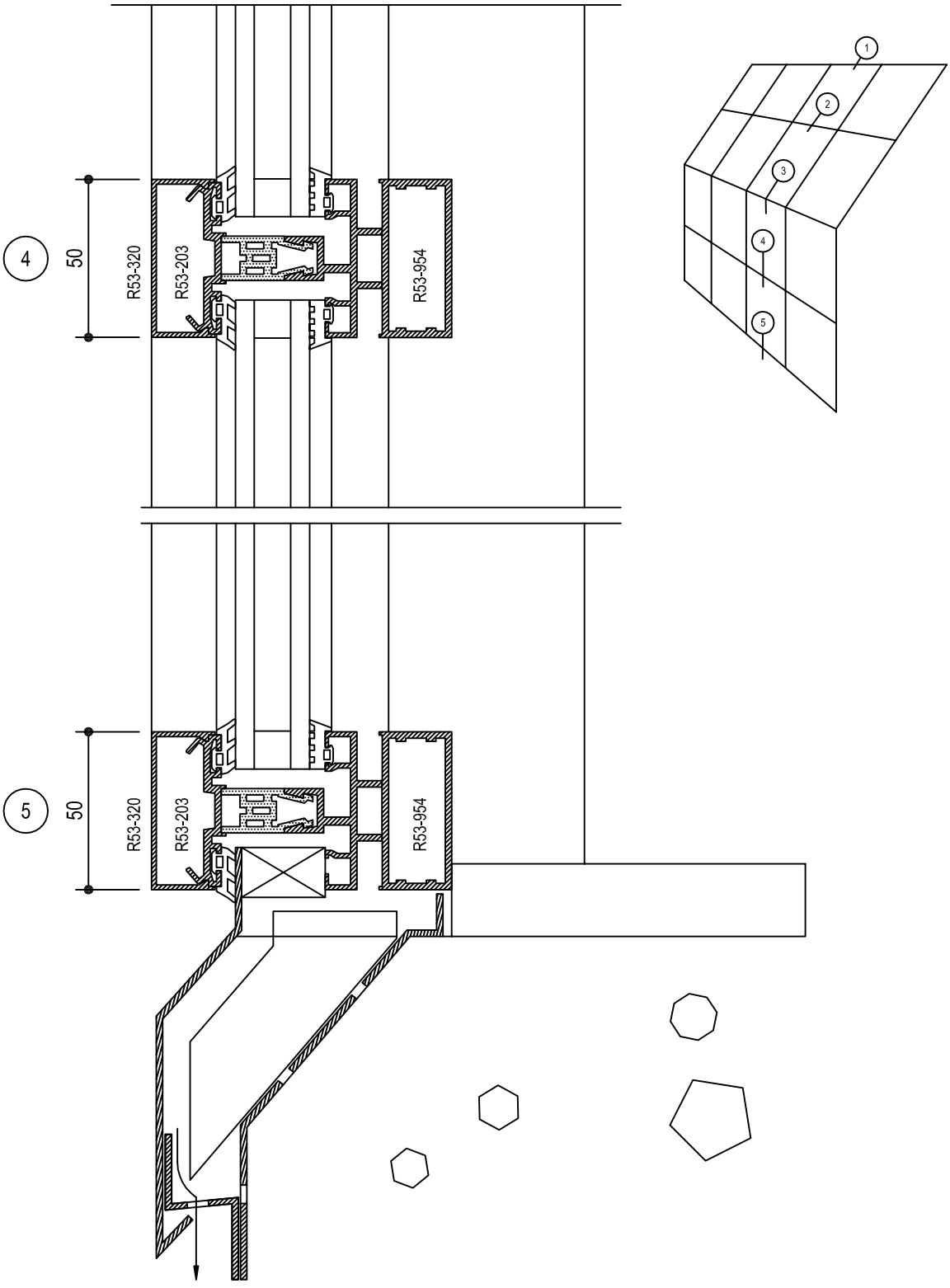
4
50
R53-320
R53-203
R53-954
5
50
R53-320
R53-203
R53-954
1
2
3
4
5

R54 Facade system Specification

1. Type

Thermally insulated aluminium-framed r54 facades are built according to the r54 instructions, either with a lap joint tecnique or an end-to-end joint technique. The end-to-end joint must be separately mentioned in the plans.)

2. Materials

- Profiles AW-6060 T6
- Gaskets EPDM-rubber
- Thermal breaks, recycled PVC
- Screws DT-DS 600 DIN 50021 or A4

3. Surface finishing

Anodisind

The aluminium profiles can be surface-treated by anodising, which is a light- and weather-proof method.

Colour.....

Painting

Polyester powder coating in desired colour, baked, base treatment by chromating

Colour.....

4. Glazing

The glazing type is..... the selections regarding glazing and related materials are performed according to glazing instruction R54. Only gaskets approved by Nordic Aluminium are used for the sealing.

5. Confiquration

The R54 structures are built according to instructions given by Nordic Alumiinium. (Machine-shop folder)

6. Connection to the building frame

The structures are attached to the building frame so that the loads on the structures are reliably transmitted to the frame, and that the deformations of the building frame and the thermal movements do not harm the structures. the fixing elements are either R54 fixing pieces, or elements made from stainless material. The seam between the R54 structure and the building frame is sealed appropriately.

7. Construction time shielding

When needed, the aluminium profile surfaces must be shielded from moulding, plastering and welding splashes and spatter, and from mechanical damages occurring during construction.

8. Functional requirements

the sructure must withstand all loads defined in the regulations, and convey them to the building frame. The structure must be implemented so that the finished structure funcktions in a controllable manner in all respects.

9. Facade maintenance

the facade is washed with clean water and a sponge. A mild detergent with a neutral pH value (5 to 7) can be used. Alkalic detergents MUST NOT BE USED.

10. Enviromental specifications

The R54 enviromental specification is available at the Rakennustietosäätiö. (www.rts.fi)