

# LEVEL roof integrated system

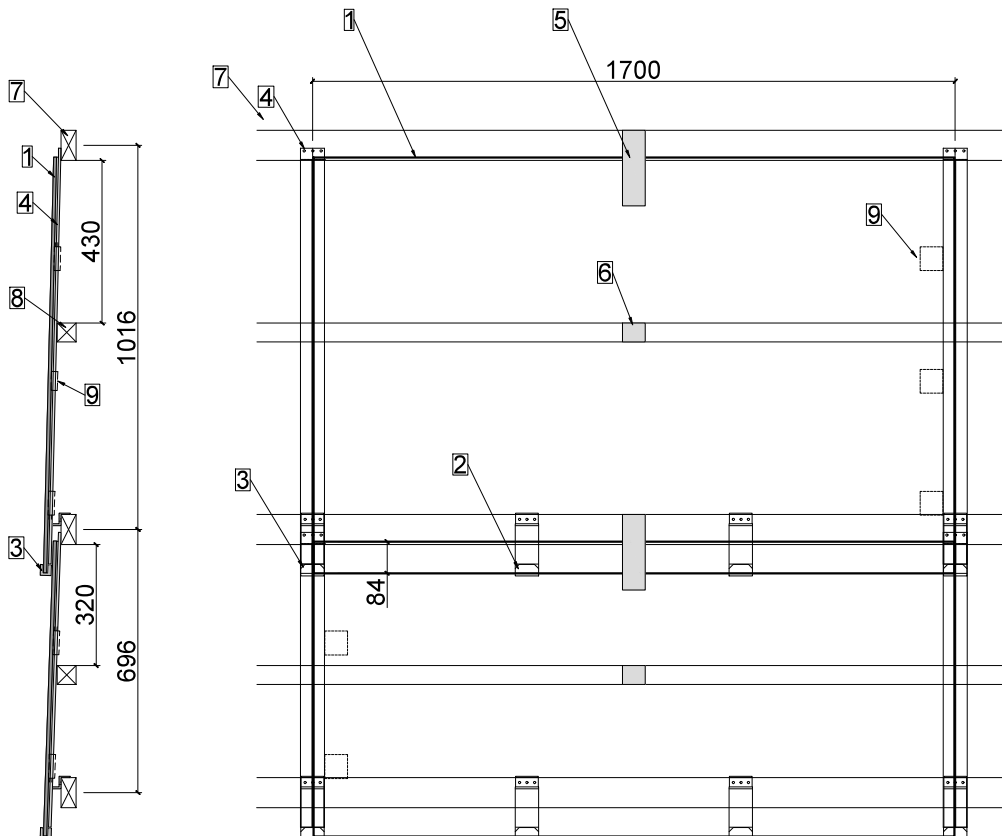
(High performance module)



## Planning information and grid dimensions (1)

| A4 | 1:20 | V25.01 |

- |   |                             |
|---|-----------------------------|
| 1 LEVEL module (6x10 junction box right & 4x10 junction box left) | 5 LEVEL support plate long  |
| 2 LEVEL central hooks   | 6 LEVEL support plate short |
| 3 LEVEL rail hooks  | 7 Roof battens 80x40        |
| 4 LEVEL rail  | 8 Roof battens 50x50        |
|   | 9 Junction box              |



### Standard grid dimension horizontal

The horizontal grid is set at 1700 mm. The edge-to-edge of the module is therefore 5 mm, and the rubber lip is 3 mm, leaving a margin of 1 mm per side of the module. This grid dimension can be extended to 1710 mm.

### Standard grid dimension vertical

The vertical grid dimension is set at 1016 mm. Depending on the project, this grid dimension can be reduced to 1000 mm or extended to 1050 mm. When reducing the size, it must be taken into consideration that, depending on the orientation of the roof, the cells may be affected by the shadow caused by the hooks. When extending the grid, it must be taken into consideration that the modules will overlap less and that wider grids will be required depending on the design.

### LEVEL modules left & right

In the standard modules, the junction boxes are mounted on the left side when viewed from the front. This must be taken into account during planning if an overhanging verge is planned, as well as for ridges and valleys. The junction boxes **cannot** be mounted on the right side of the LEVEL High performance module's side.

# LEVEL roof integrated system

(High performance module)



## Planning information and grid dimensions (2)

| A4 | 1:25 | V25.01 |

### Wind and snow loads

The layout shown (Planning information and grid dimensions (1)) meets the requirements of IEC 61215. To meet increased requirements, more middle hooks and support plates can be mounted. See also "LEVEL layout for increased requirements". Statics and professional execution are always the responsibility of the contractor.

### Requirement for the subroof and recommendation of rear ventilation (counterbattens in mm)

Roof pitch 3° to 5 < 800 m a.s.l.   > 800 m a.s.l.		Roof pitch 6° to 13 < 800 m a.s.l.   > 800 m a.s.l.		Roof pitch from 14° to 25 < 800 m a.s.l.   > 800 m a.s.l.		Roof pitch from 25 < 800 m a.s.l.   > 800 m a.s.l.		Rafter length
Subroof in Flat roof quality		Subroof for extraordinary exposure		Subroof for increased exposure		Subroof for normal exposure		
80	80	80	80	80	80	80	80	<5 m
80	100	80	100	80	100	80	80	5-8 m
100	120	100	120	100	120	80	100	8-15 m
120	140	120	140	120	140	80	120	>15 m

It is recommended to always drain the subroof into the gutter. Further notes and recommendations on the subject of subroofs can be found and observed in document **Vxx.xx Requirements for Megasol in-roof systems subroof**.

### Roof pitch less than 10°

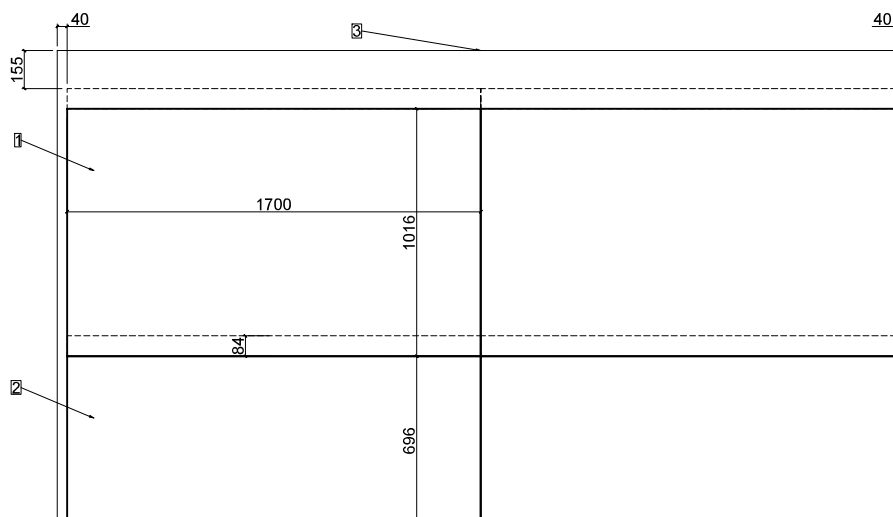
Additional measures recommended to prevent the modules from sliding upwards.

### Aeration and ventilation opening

The free cross-section of the ventilation openings must correspond to half of the ventilation space (height of counterbattens). Reduction by perforated plate must be taken into consideration. In the case of roof penetrations, a constructive measure is required for detour.

### Offer plan layout

The modules are laid out in grid dimensions in the quotation plans. The roof line refers to the outer edge of the counterbattens for the eaves and ridge, and to the outer edge of the roof battens for the verge.



- 1 LEVEL module 1695x1100, grid dimension 1700x1016
- 2 LEVEL module 1695x780, grid dimension 1700x696
- 3 Roof line

# LEVEL roof integrated system

(High performance module)



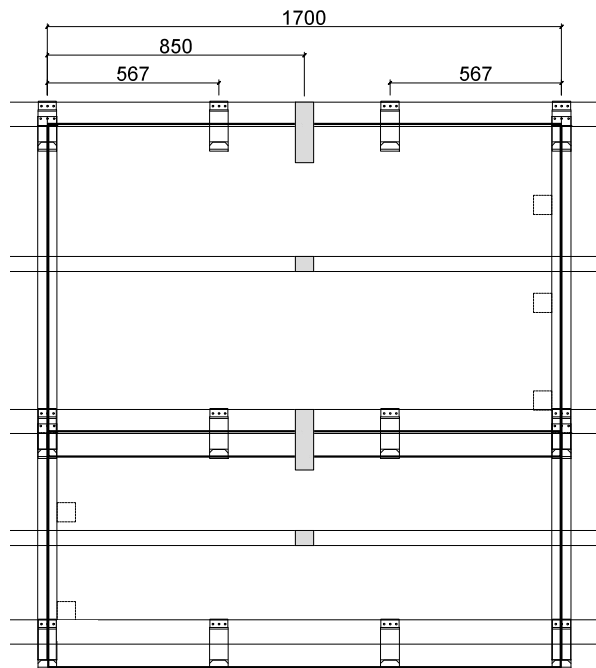
## Item configuration for normal requirements

| A4 | 1:25 | V25.01 |

Application recommendation for wind suction forces  $< 3.5 \text{ kN/m}^2$ , Snow load  $< 3.5 \text{ kN/m}^2$

### Basic article with standard finish

Rail verge left & right



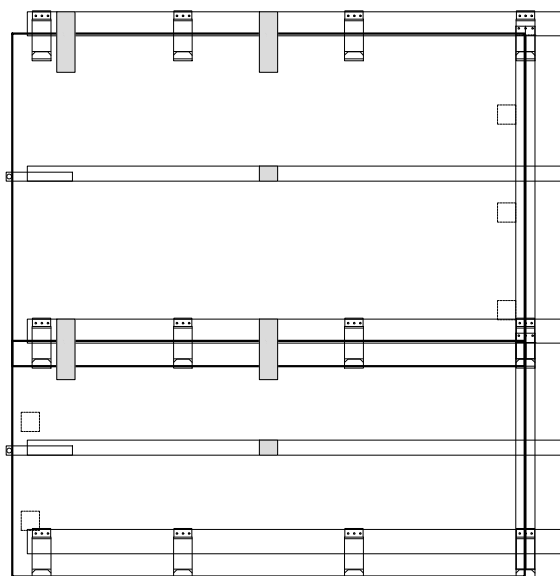
- 1 rail/module plus  
1 rail/rail end (verge)
- 1 rail hook/rail
- 2 middle hooks/1695mm module
- 1 support plate short and 1 support plate long/1695mm module

### Ridge finish with middle hook

- Additional 3 middle hooks/1695mm  
Module in the top row plus  
1 middle hook at the end of the row (verge)

### Basic article with overhanging verge

No rail verge left & right



- 1 rail/module minus  
1 rail/rail end (verge)
- 1 rail hook/rail
- 2 middle hooks/1695mm Modu
- 1 support plate short and 1 support plate long/1695mm module plus  
1 support plate long/row end (verge)
- 1 side support/row end (verge)
- 1 middle hook/end of row (verge)

### Ridge finish with middle hook

- Additional 3 middle hooks/1695m  
Module in the top row plus  
1 middle hook/end of row (verge)

# LEVEL roof integrated system

(High performance module)

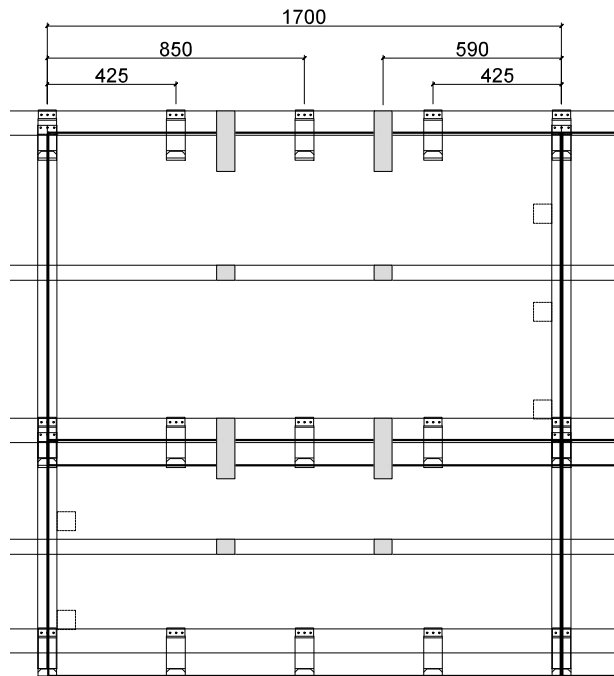


Layout for increased and extraordinary requirements

| A4 | 1:25 | V25.01 |

## Increased claims

Wind suction 3.5 - 4.7 kN/m<sup>2</sup>, Snow load 3.5 - 8 kN/m<sup>2</sup>



### Rail & middle hooks

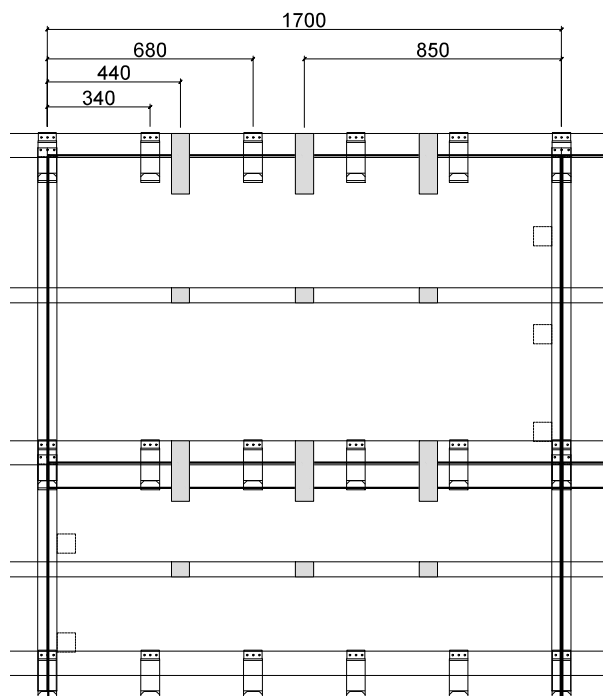
- 3 Middle hooks/1695x1100mm module

### Support plates

- 2 Support plates short and 2 support plates long/1695x1100mm module

## Extraordinary claims

Wind suction 4.7 - 5.9 kN/m<sup>2</sup>, Snow load 8 - 13 kN/m<sup>2</sup>



### Rail & middle hooks

- 4 Middle hooks/1695x1100mm module

### Support plates

- 3 Support plates short and 3 support plates long/1695x1100mm module

All data (kN/m<sup>2</sup>) are load limits without safety factors. The static of the entire roof structure is the responsibility of the contractor.

# LEVEL roof integrated system

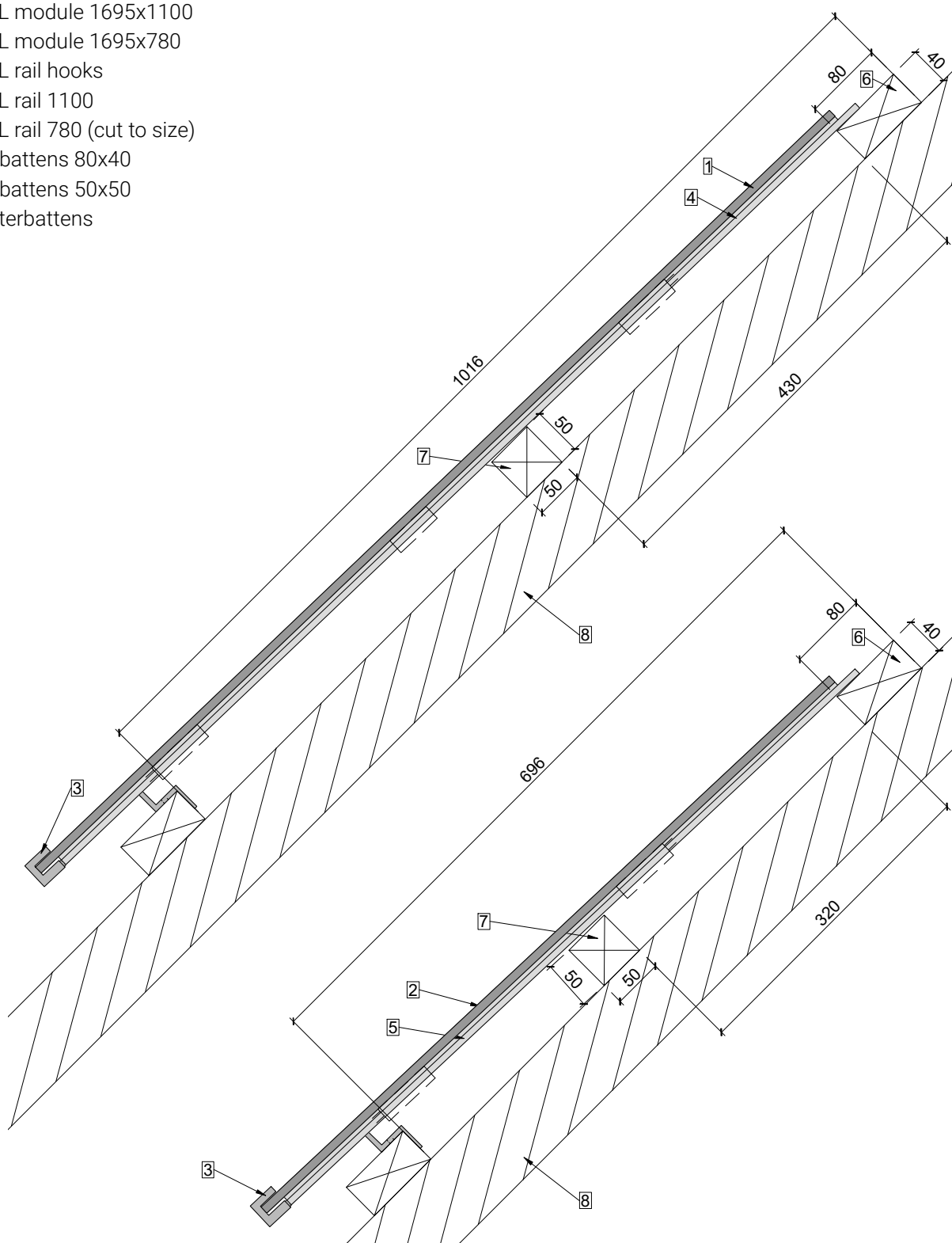
(High performance module)



## Rails and roof battens

| A4 | 1:6 | V25.01 |

- 1 LEVEL module 1695x1100
- 2 LEVEL module 1695x780
- 3 LEVEL rail hooks
- 4 LEVEL rail 1100
- 5 LEVEL rail 780 (cut to size)
- 6 Roof battens 80x40
- 7 Roof battens 50x50
- 8 Counterbattens



# LEVEL roof integrated system

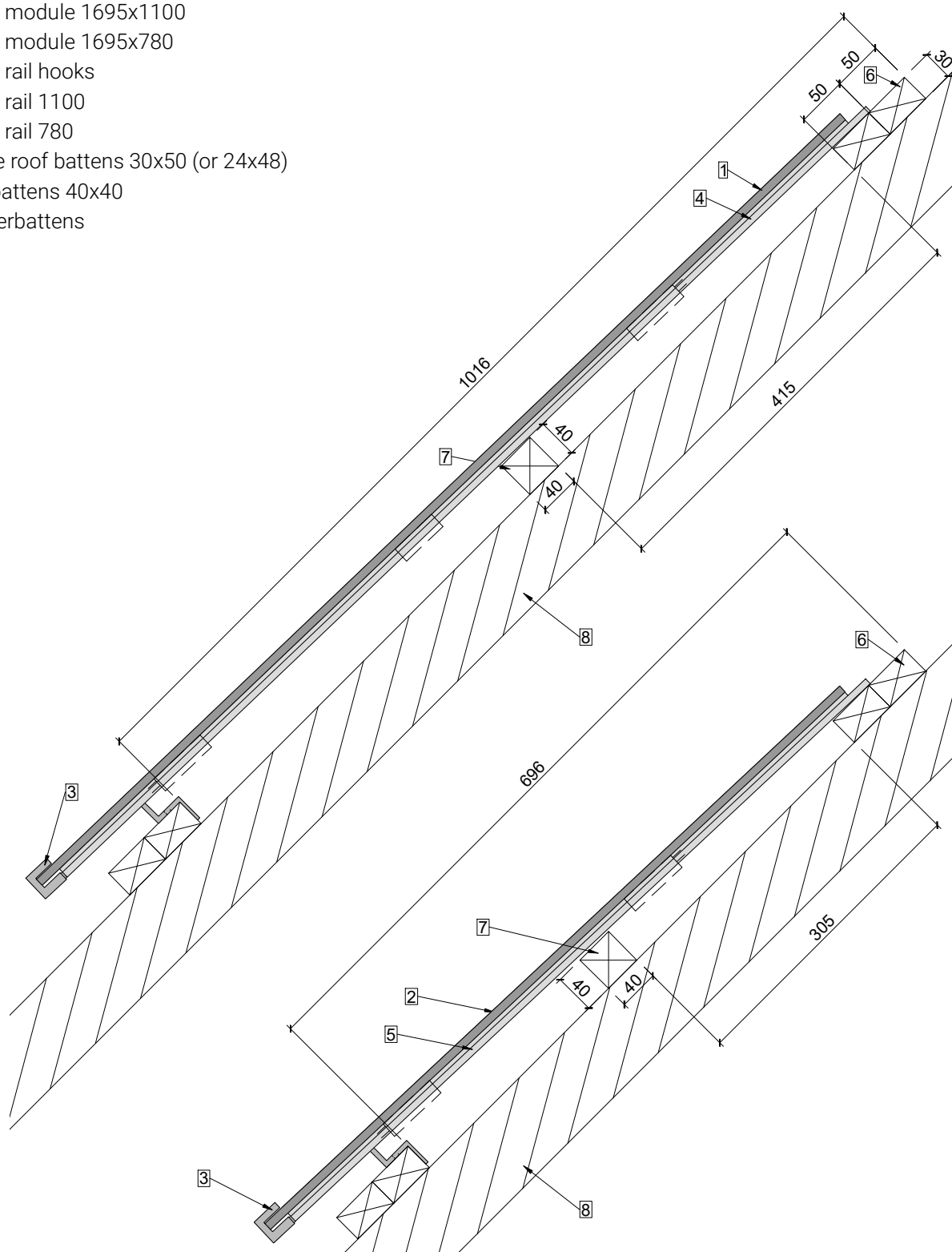
(High performance module)



## Rails and roof battens

| A4 | 1:6 | V25.01 |

- 1 LEVEL module 1695x1100
- 2 LEVEL module 1695x780
- 3 LEVEL rail hooks
- 4 LEVEL rail 1100
- 5 LEVEL rail 780
- 6 Double roof battens 30x50 (or 24x48)
- 7 Roof battens 40x40
- 8 Counterbattens



# LEVEL roof integrated system

(High performance module)



## Roof battens span

| | A4 | V25.01 |

### Layout for grid dimension in height of 1016mm

- Spans / cantilever length in millimeters
- Area load (pressure) in  $\text{kN/m}^2$ , char. Value without load coefficients
- The LEVEL system must be mounted on suitable substructures that are designed for the corresponding mechanical loads of wind, snow and dead weight of the solar modules..
- System weight: approx.  $22\text{kg/m}^2$  (LEVEL Standard module & mounting material)

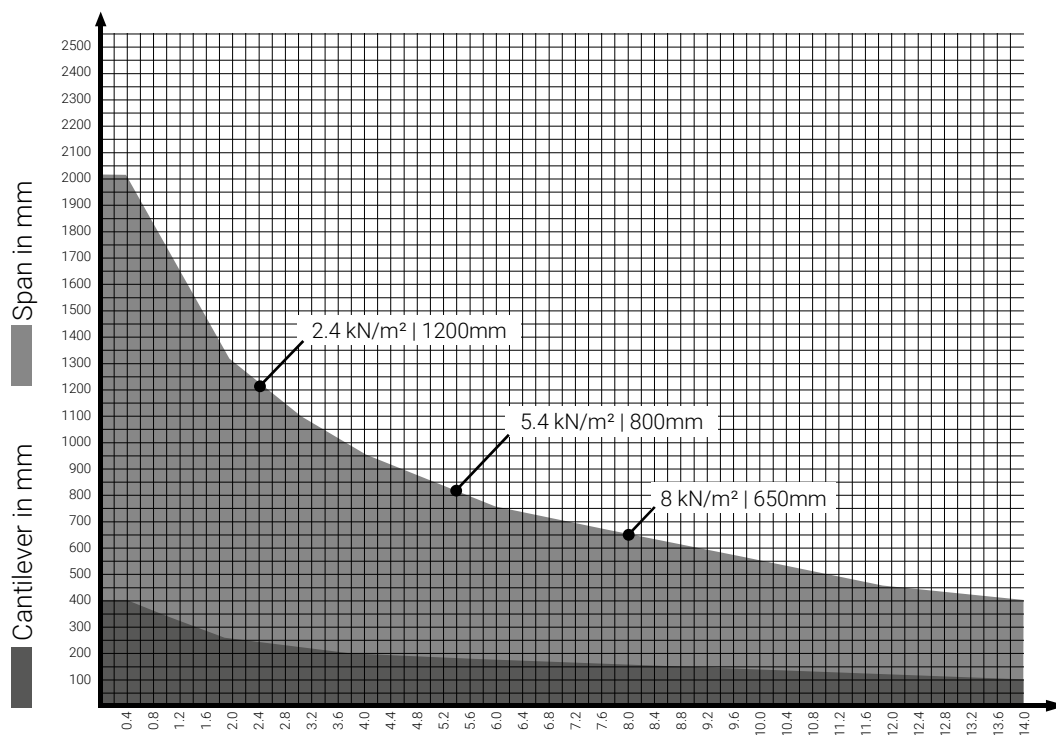


chart. Area load (pressure)  $\text{kN/m}^2$

# LEVEL roof integrated system

(High performance module)



Roof battens span

| | A4 | V25.01 |

## Layout for grid dimension in height of 1016mm

- Spans / cantilever length in millimeters
- Area load (pressure) in  $\text{kN/m}^2$ , char. Value without load coefficients
- The LEVEL system must be mounted on suitable substructures that are designed for the corresponding mechanical loads of wind, snow and dead weight of the solar modules..
- System weight: approx.  $22\text{kg/m}^2$  (LEVEL Standard module & mounting material)

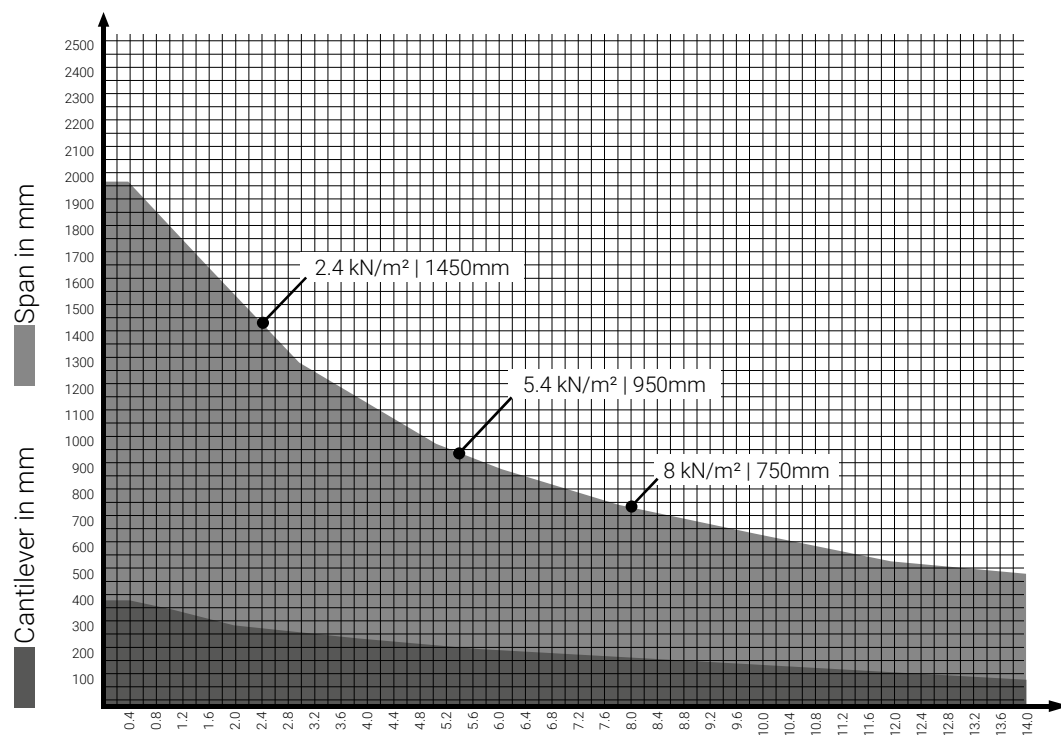


chart. Area load (pressure)  $\text{kN/m}^2$



# LEVEL roof integrated system

(High performance module)

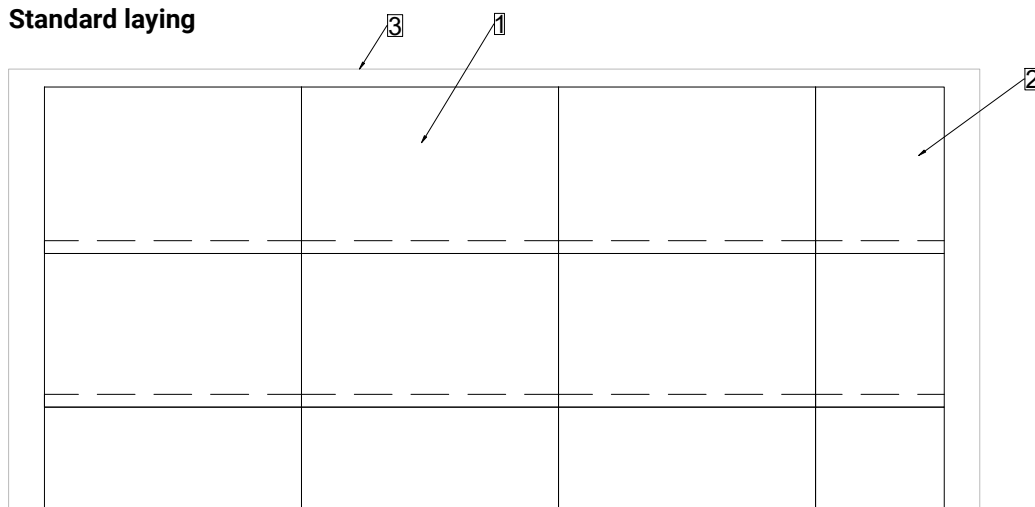


## Laying with aluminum composite module

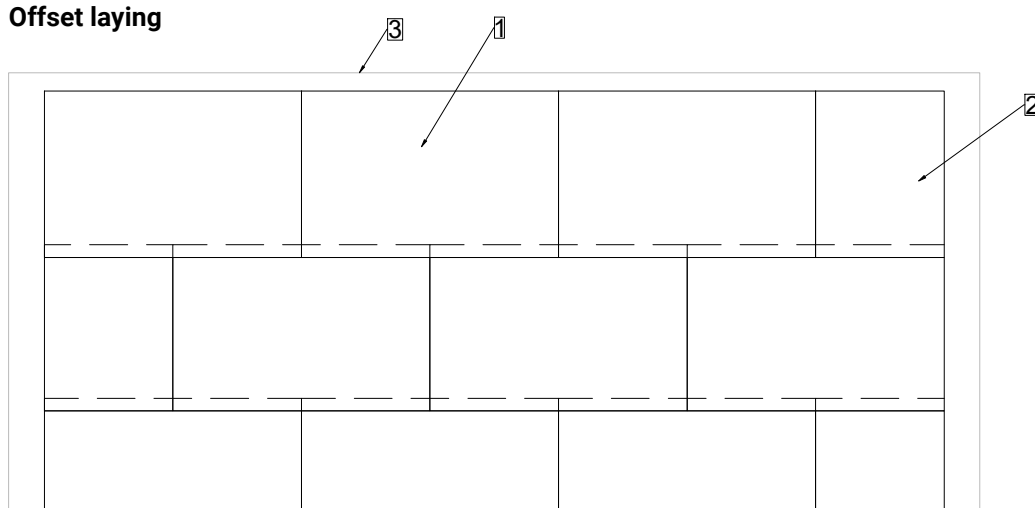
| A4 | 1:50 | V25.01 |

- 1 LEVEL Standard module (Grid dimension)
- 2 Aluminum composite module
- 3 Roof edge

### Standard laying



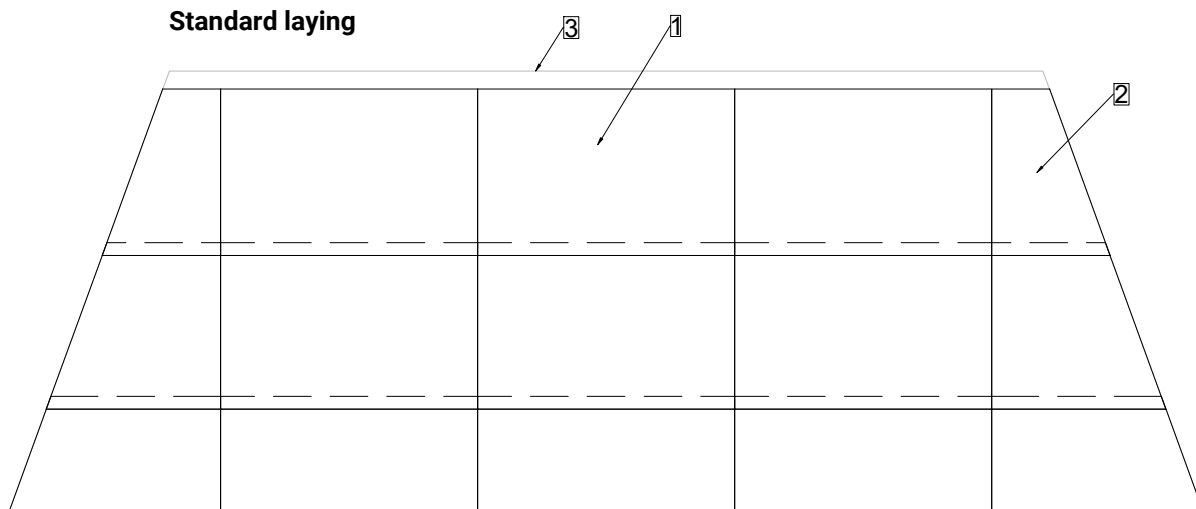
### Offset laying



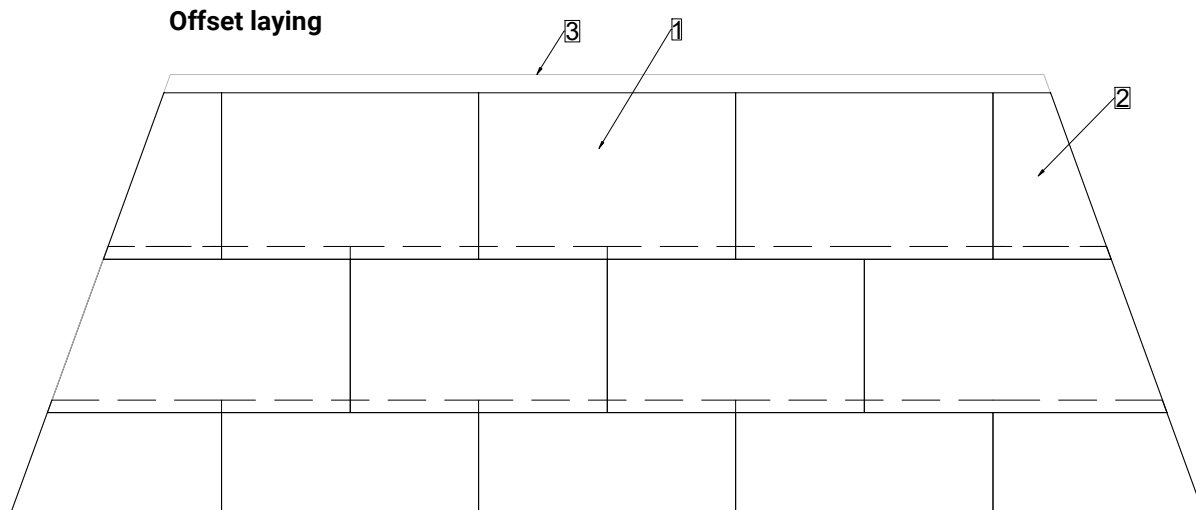
Distance to ridge, eaves and verge varies depending on the on-site finish variant.

- 1 LEVEL Standardmodule (Grid dimension)
- 2 Aluminium composite module
- 3 Roof edge

**Standard laying**



**Offset laying**

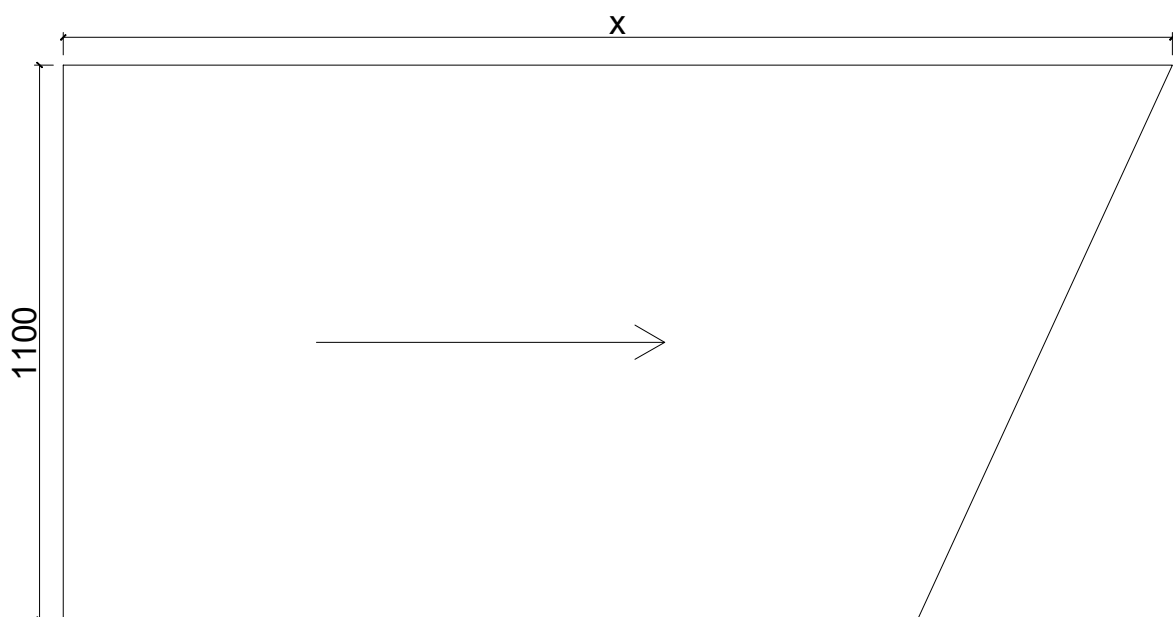
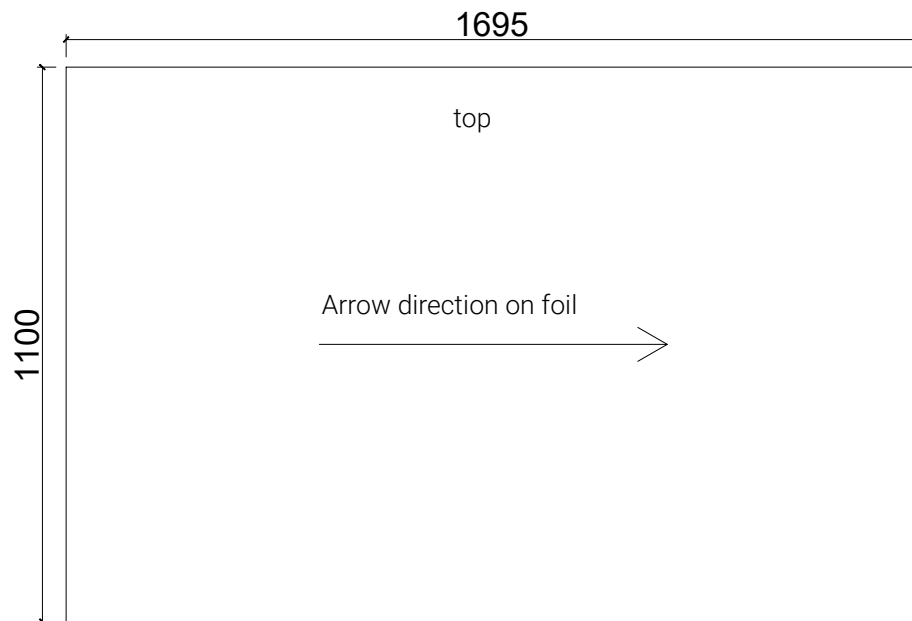


Distance to ridge, eaves and verge varies depending on the on-site finish variant.

Standard dimension of "LEVEL aluminium composite module" is 1695x1100 mm.

"LEVEL aluminium composite module special" is cut to size.

LEVEL aluminium composite modules can be easily reworked and therefore complicated situations (chimney, skylight, edge termination, etc.) can be solved on site with the same mounting components.



LEVEL aluminium composite modules have a black matt coating. This coating is protected with a foil. Lay the modules so that the arrows on the foil point from left to right when looking at the roof from the front.

# LEVEL roof integrated system

(High performance module)



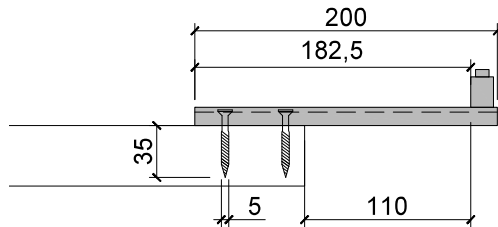
## Details of the screws

| A4 | 1:5 | V25.01 |

### LEVEL side support

2 pcs. - d5 - 35mm thread in roof battens

corrosion resistant



### LEVEL support plate long & short

2 resp. 1 pc. - d5 - 35mm countersunk head

35mm thread in roof battens

corrosion resistant

### LEVEL rail

2 pcs. - d5 - 35mm thread in roof battens

corrosion resistant

### LEVEL rail hooks and middle hooks

3 pcs. - d5 - 35mm thread in roof battens

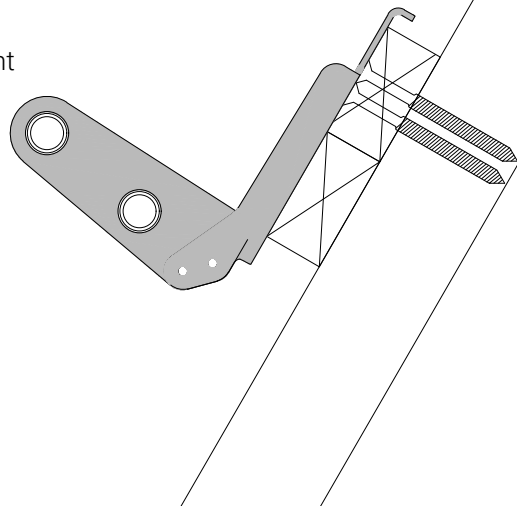
corrosion resistant

### LEVEL snow hook SEP

2 pcs. - d8 - 80mm thread

in counterbattens

corrosion resistant



# LEVEL roof integrated system

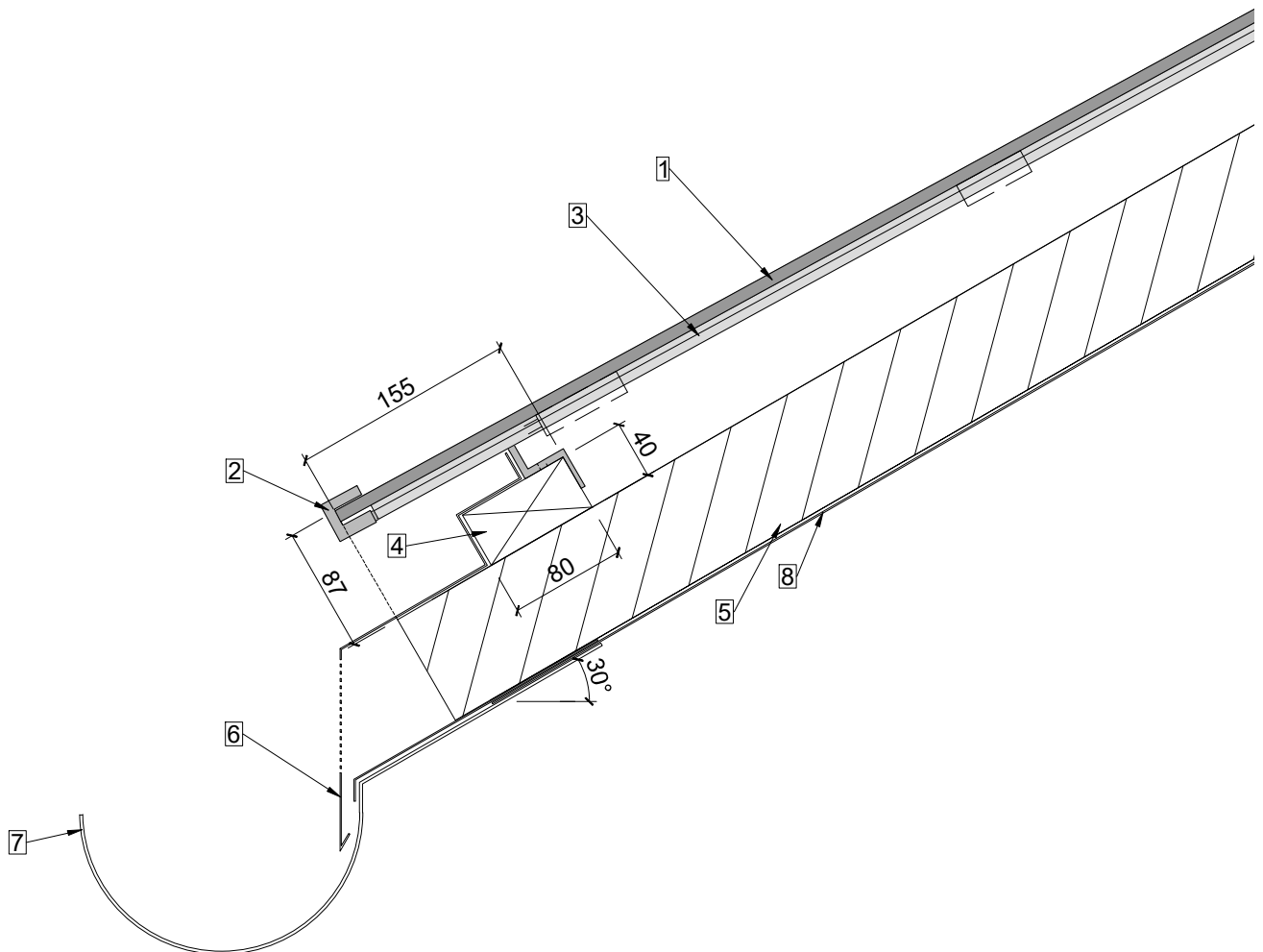
(High performance module)



## Eaves finish

| A4 | 1:5 | V25.01 |

- 1 LEVEL module
- 2 LEVEL rail hooks
- 3 LEVEL rail
- 4 Roof battens 80x40
- 5 Counterbattens
- 6 Ventilation plate
- 7 Gutter
- 8 Subroof



The installation situations shown serve as a suggested solution and orientation. The correct planning and execution must be adapted to local conditions and situations and is the responsibility of the contractor.

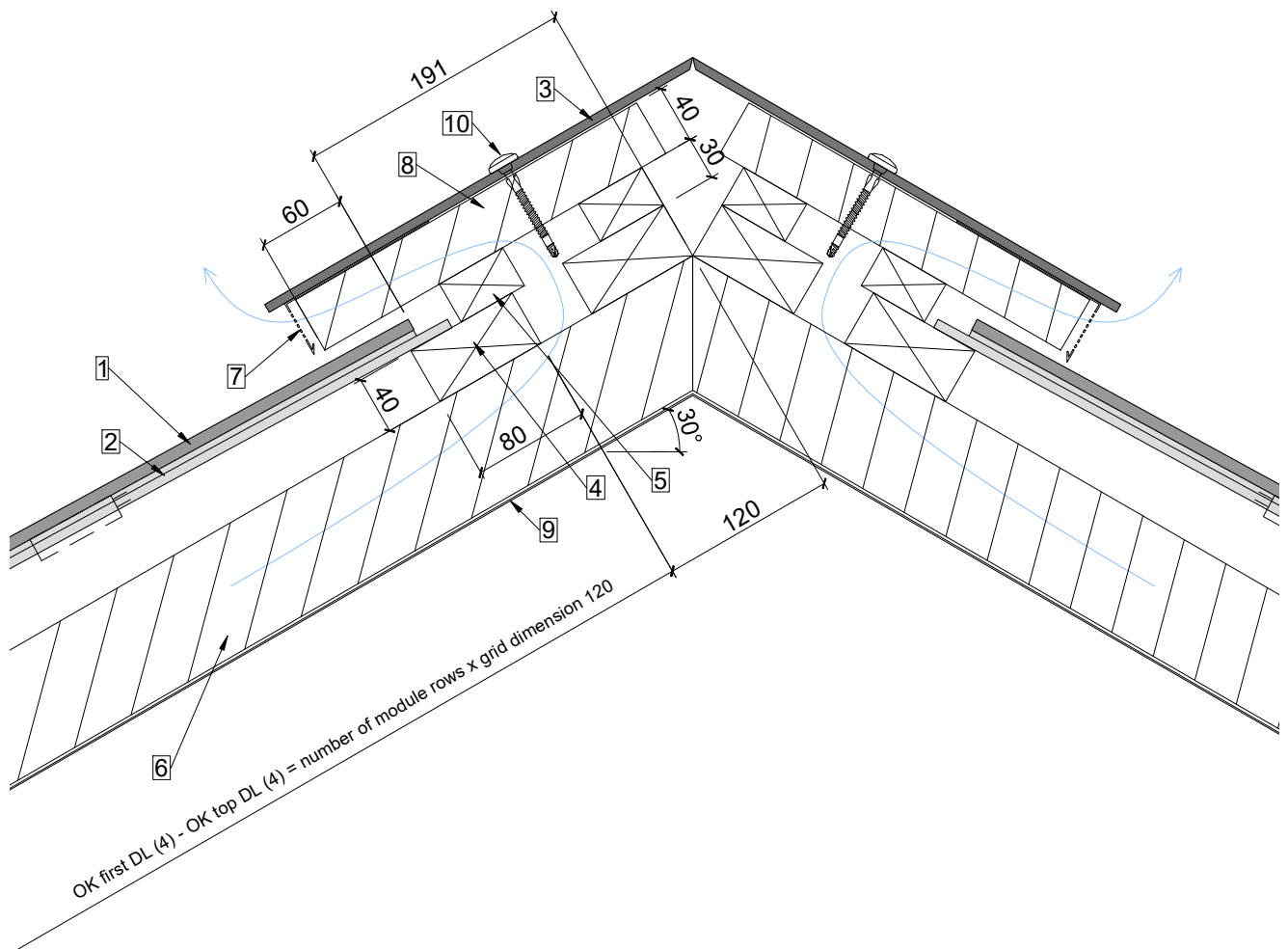
# LEVEL roof integrated system

(High performance module)



Ridge finish without hooks with aluminum composite plate | A4 | 1:5 | V25.01 |

- 1 LEVEL module
- 2 LEVEL rail
- 3 Aluminum composite plate
- 4 Roof battens 80x40
- 5 Horizontal battens 30x50
- 6 Counterbattens
- 7 Ventilation plate
- 8 Vertical ventilation timber 40x40
- 9 Subroof
- 10 Screw with sealing ring



Securing the top row of modules on site.

The installation situations shown serve as a suggested solution and orientation. The correct planning and execution must be adapted to local conditions and situations and is the responsibility of the contractor.

# LEVEL roof integrated system

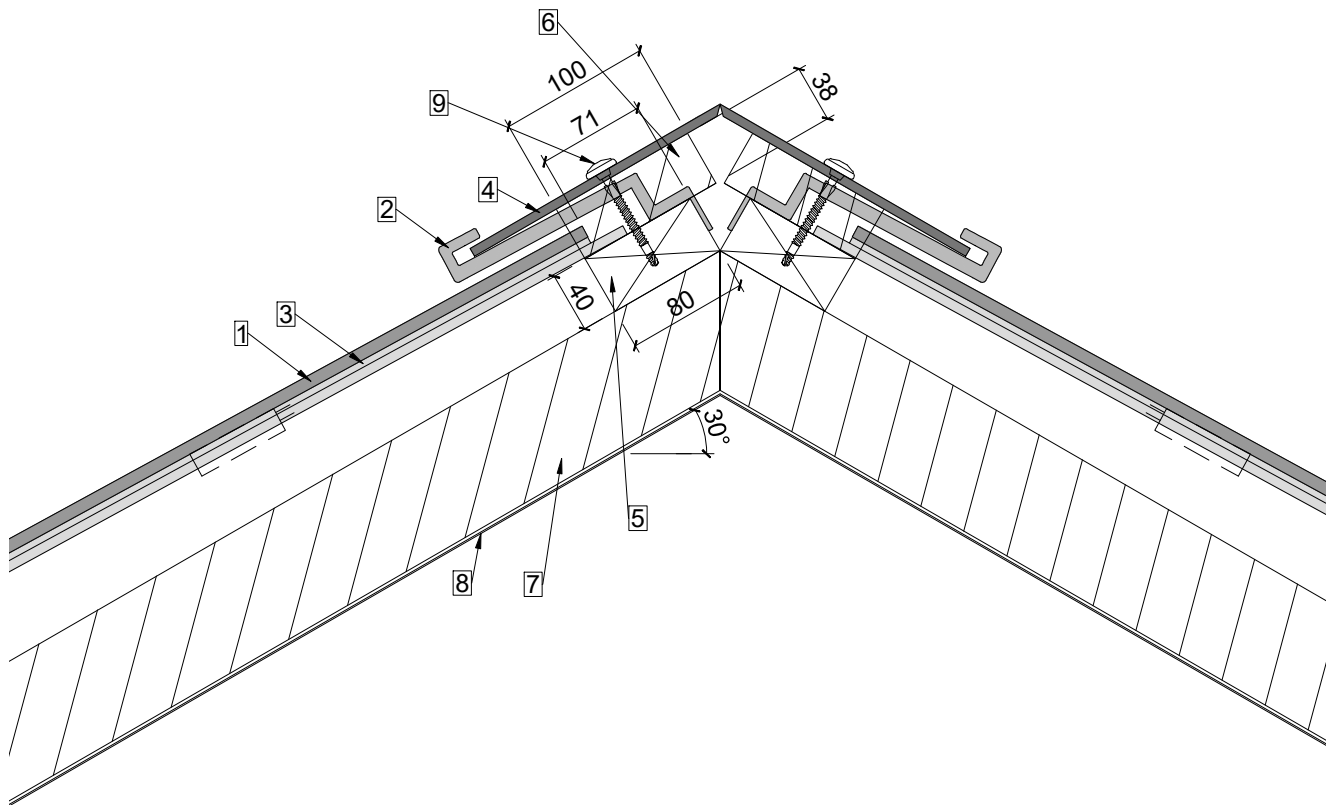
(High performance module)



Ridge finish compact (for rafter lengths up to 5 m)

| A4 | 1:5 | V25.01 |

- 1 LEVEL module
- 2 LEVEL middle hook
- 3 LEVEL rail
- 4 Aluminum composite plate
- 5 Roof battens 80x40
- 6 Vertical battens 40x38
- 7 Counterbattens
- 8 Subroof
- 9 Screw with sealing ring



The installation situations shown serve as a suggested solution and orientation. Correct planning and execution must be adapted to local conditions and situations and is the responsibility of the contractor.

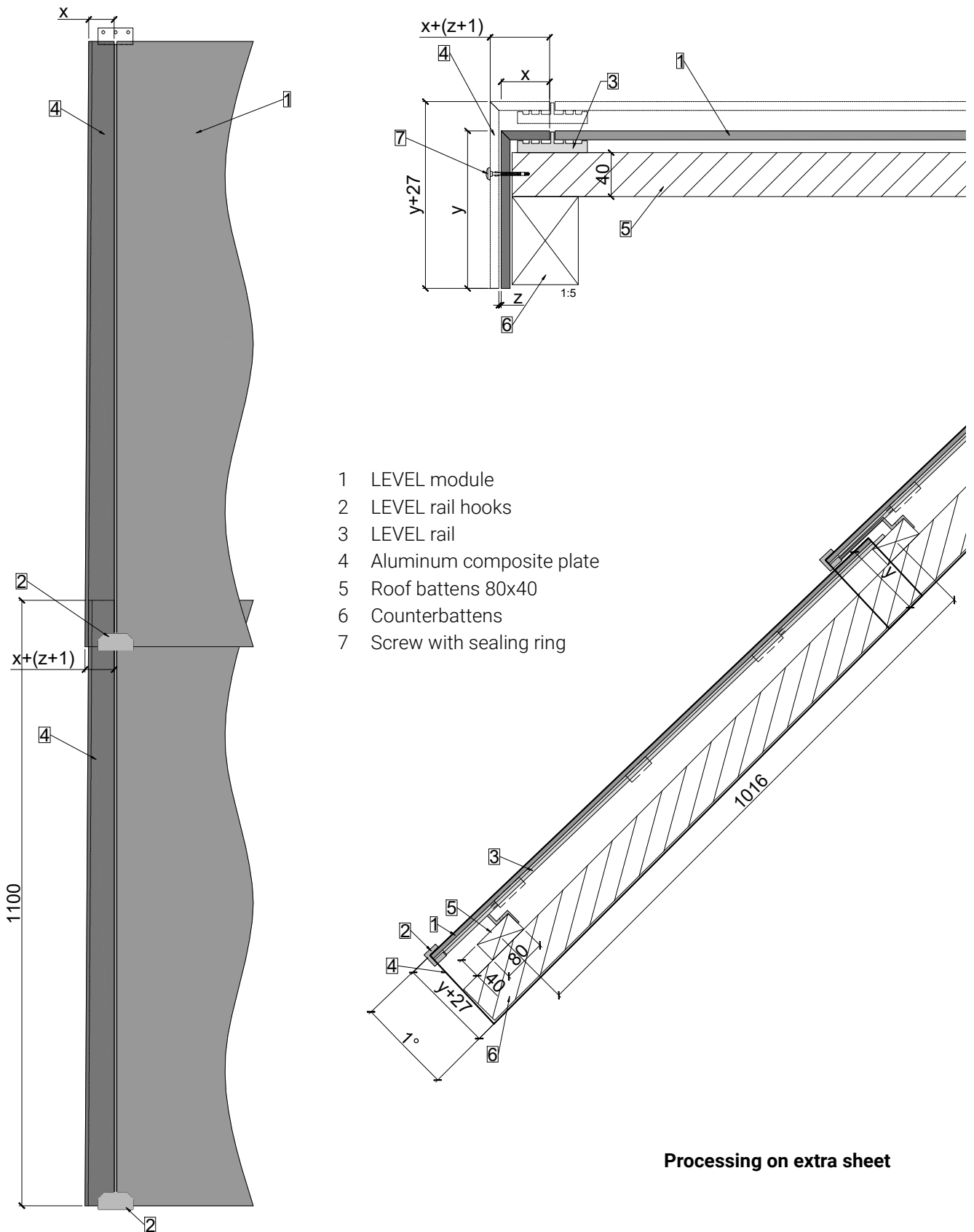
# LEVEL roof integrated system

(High performance module)



## Verge with aluminum composite plate

| A4 | 1:5 | V25.01 |



The installation situations shown serve as a suggested solution and orientation. Correct planning and execution must be adapted to local conditions and situations and is the responsibility of the contractor.



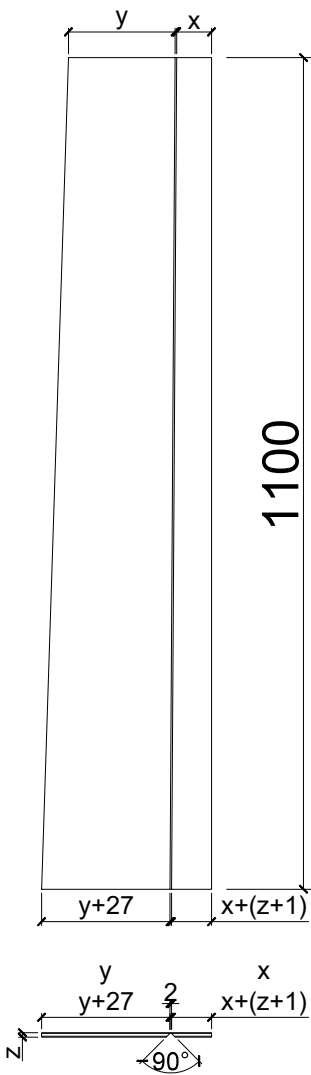
# LEVEL roof integrated system

(High performance module)

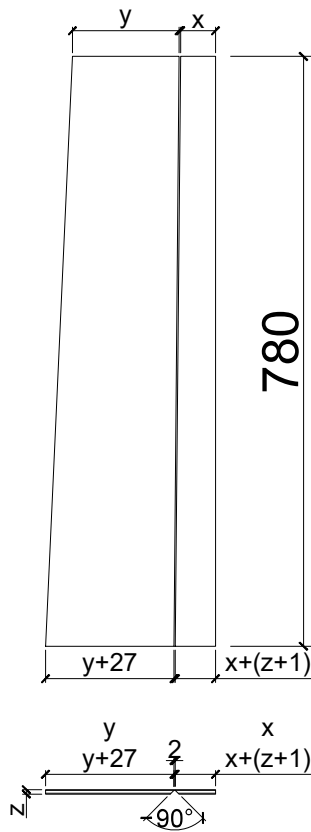


Verge with aluminum composite plate - unwinding | A4 | 1:5 | V25.01 |

Unfolding aluminum composite plate  
Verge left 1100 mm



Unfolding aluminum composite plate  
Verge left 780 mm



# LEVEL roof integrated system

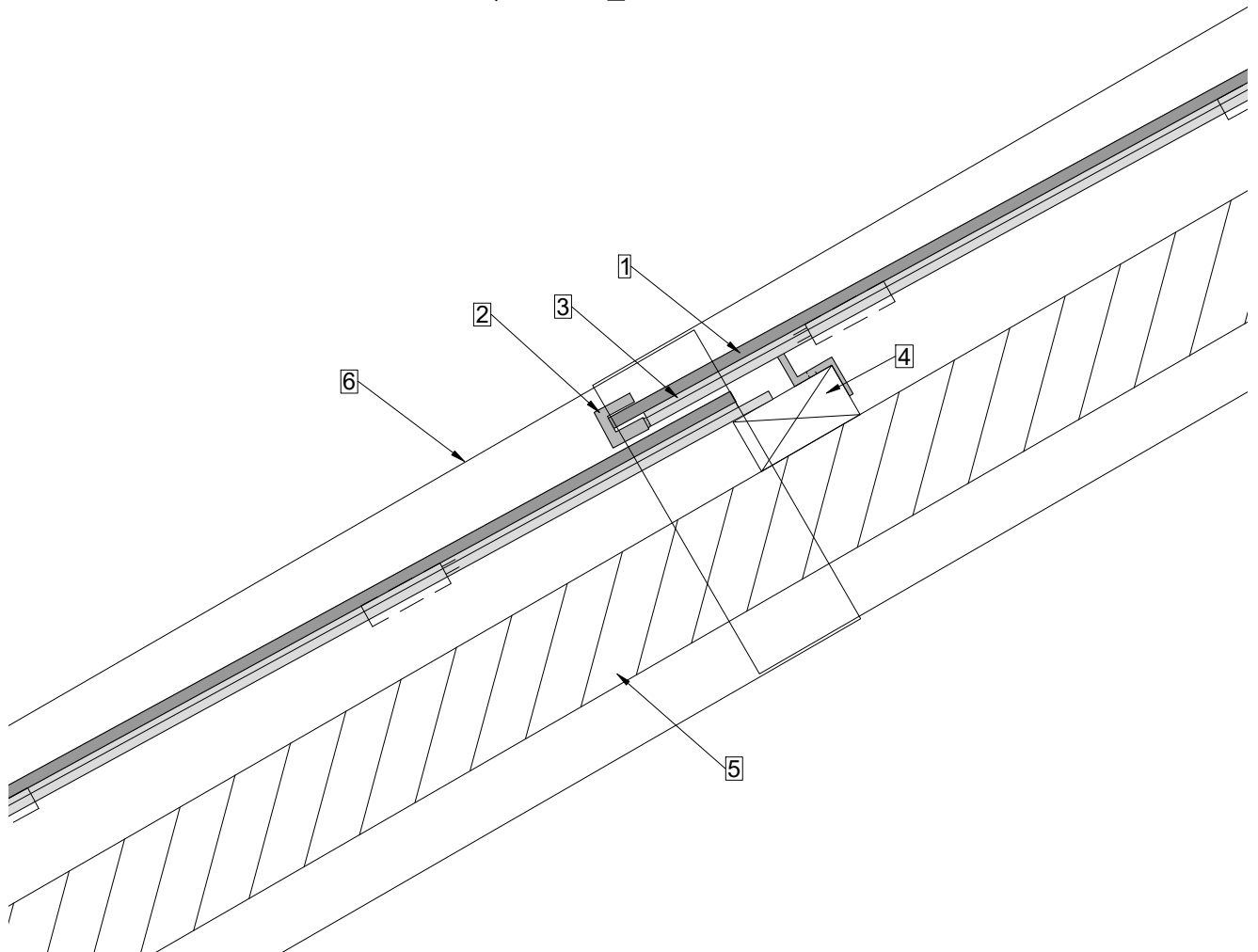
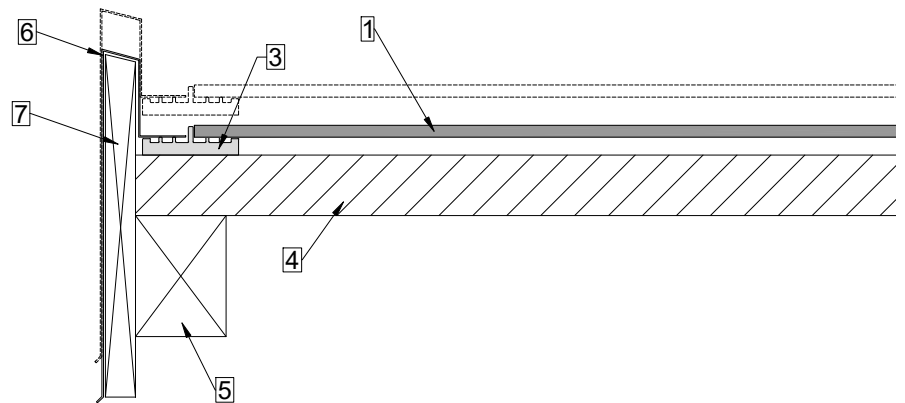
(High performance module)



## Verge with sheet metal finish

| A4 | 1:5 | V25.01 |

- 1 LEVEL module
- 2 LEVEL rail hooks
- 3 LEVEL rail
- 4 Roof battens 80x40
- 5 Counterbattens
- 6 Sheet metal tinsmith
- 7 Verge plate



The installation situations shown serve as a suggested solution and orientation. Correct planning and execution must be adapted to local conditions and situations and is the responsibility of the contractor.

# LEVEL roof integrated system

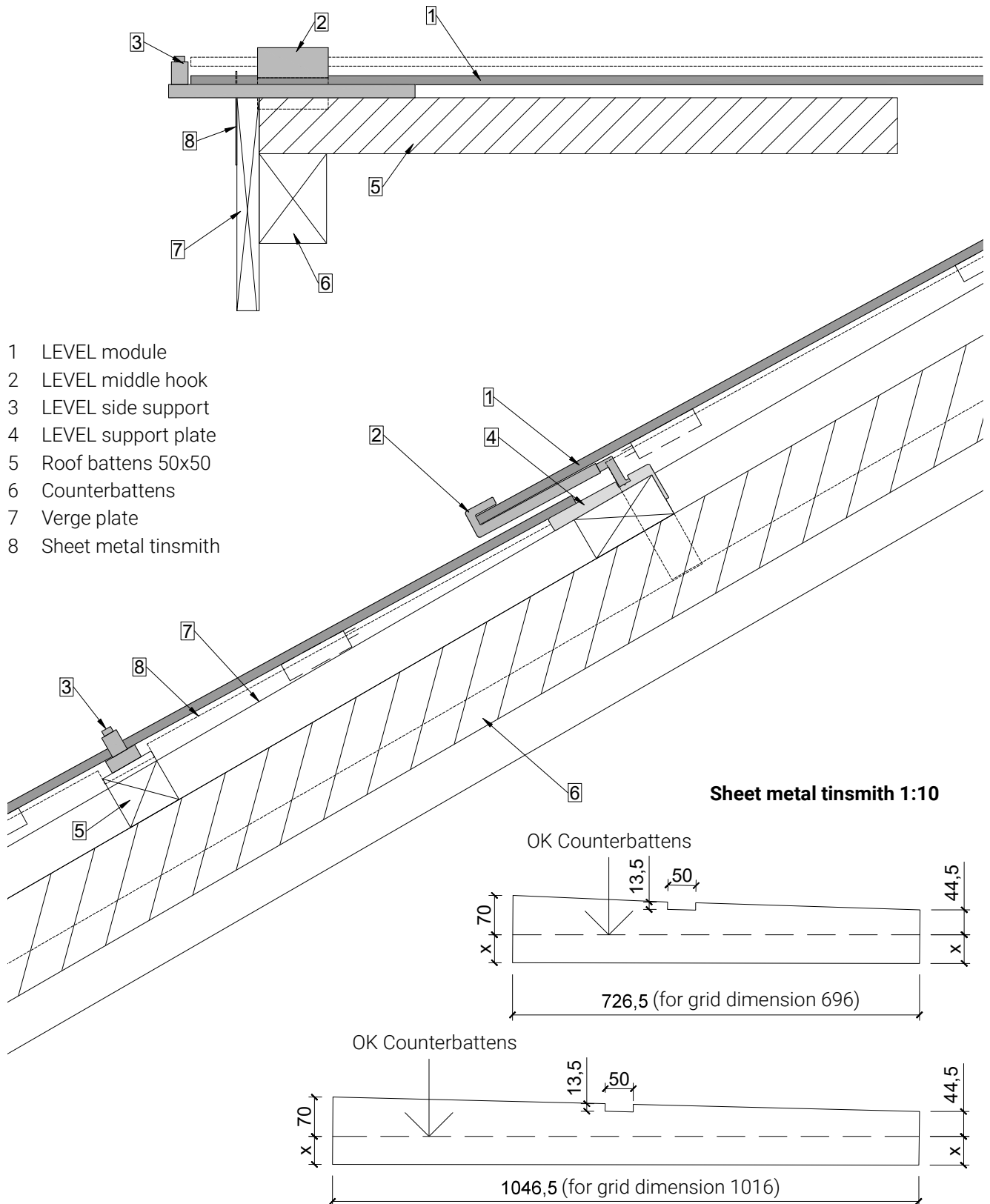
(High performance module)



## Verge with overlapping modules

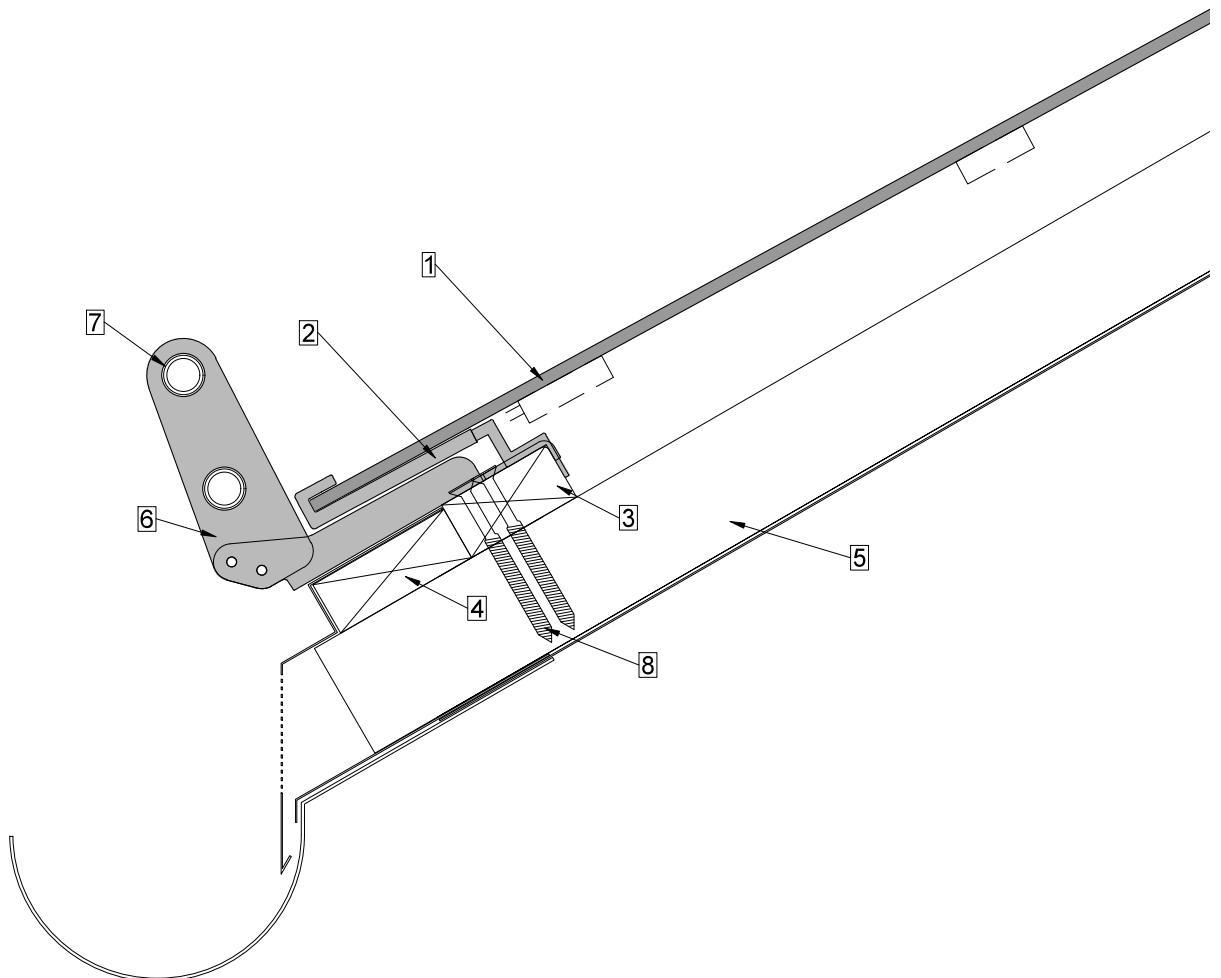
| A4 | 1:5 | V25.01 |

**Note the position of the junction box! Depending on the situation, a cut-out in the verge plate may be necessary.**



The installation situations shown serve as a suggested solution and orientation. Correct planning and execution must be adapted to local conditions and situations and is the responsibility of the contractor.

- 1 LEVEL module
- 2 LEVEL middle hook / rail hook
- 3 Wooden board
- 4 Counterbattens
- 5 LEVEL snow guard SEP (snow hook SEP with snow guard plate SEP)
- 6 LEVEL snow guard pipe
- 7 Screws in counterbattens



Snow hook SEP is placed under each hook and screwed into the counterbattens.

Fasten the "snow guard plate" with M6 screws after inserting the modules.

For higher demands, Megasol recommends using the SEP Max

# LEVEL roof integrated system

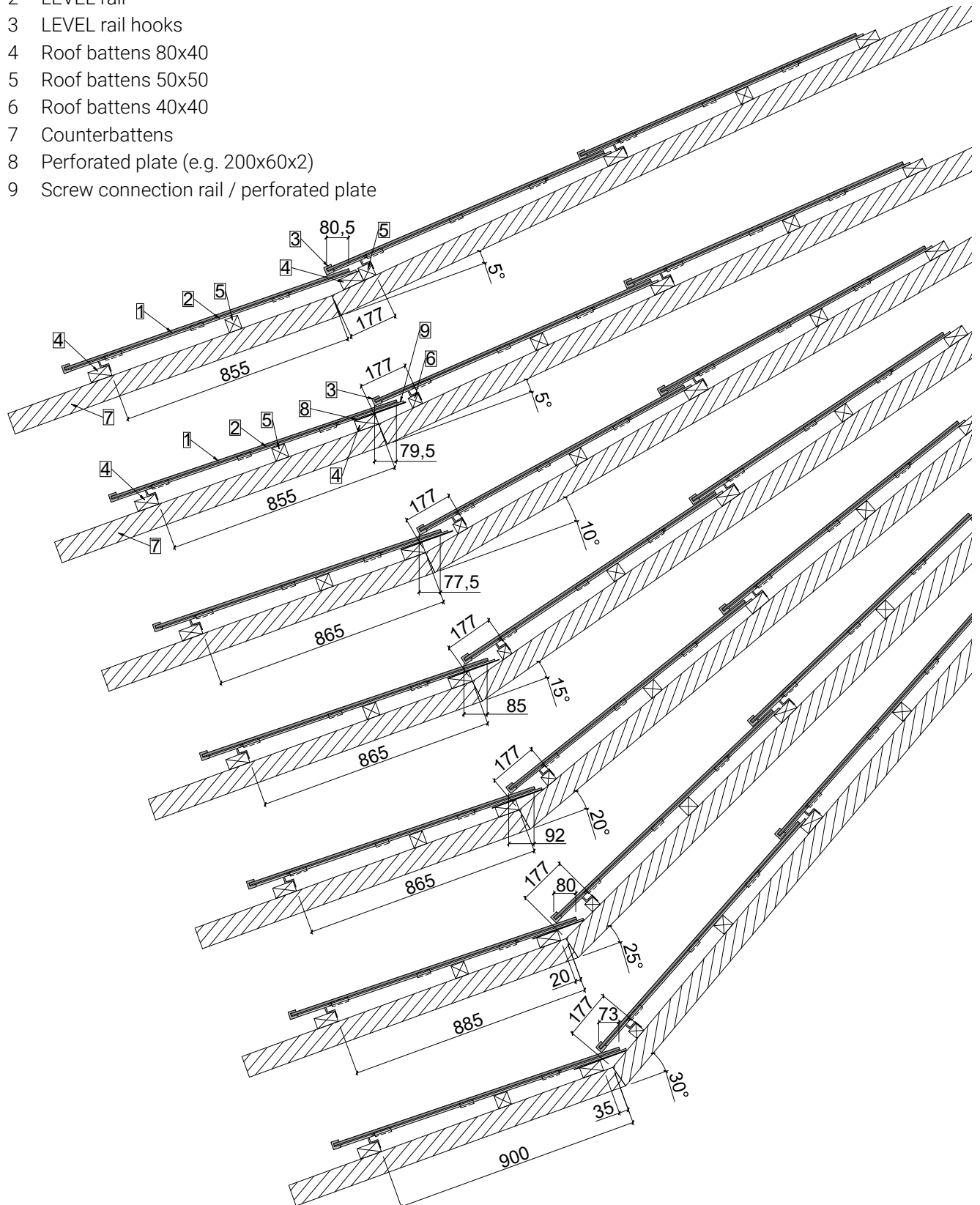
(High performance module)



## Roof breakage with LEVEL module

| A4 | 1:20 | V25.01 |

- 1 LEVEL module
- 2 LEVEL rail
- 3 LEVEL rail hooks
- 4 Roof battens 80x40
- 5 Roof battens 50x50
- 6 Roof battens 40x40
- 7 Counterbattens
- 8 Perforated plate (e.g. 200x60x2)
- 9 Screw connection rail / perforated plate



Roof fractures over 30° are also possible.

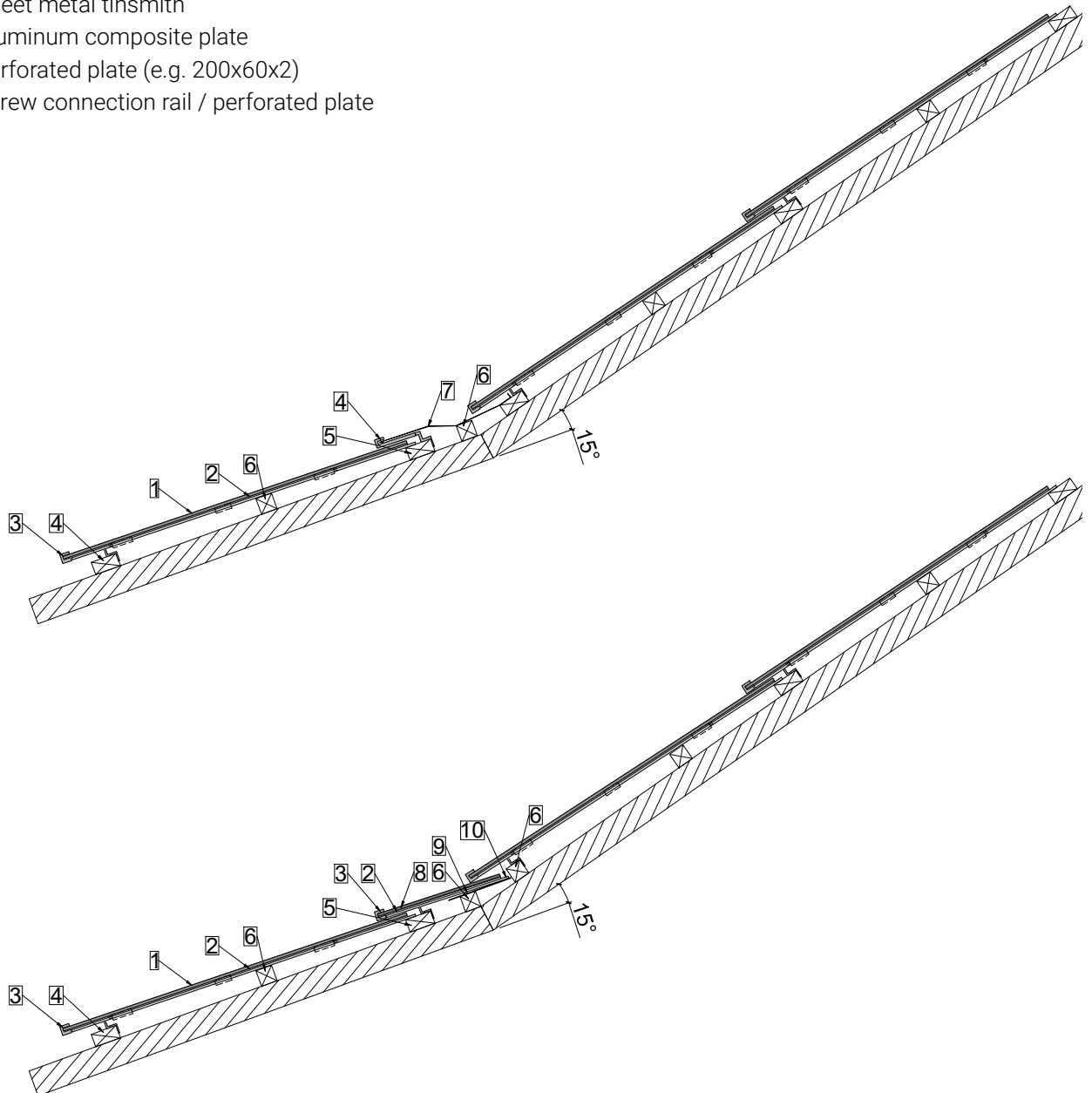
# LEVEL roof integrated system

(High performance module)



## Roof break with sheet metal tinsmith or aluminum composite plate V25.01 |

- 1 LEVEL module
- 2 LEVEL rail
- 3 LEVEL rail hooks
- 4 LEVEL middle hooks
- 5 Roof battens 80x40
- 6 Roof battens 50x50
- 7 Sheet metal tinsmith
- 8 Aluminum composite plate
- 9 Perforated plate (e.g. 200x60x2)
- 10 Screw connection rail / perforated plate



Roof breaks 1° - 90° possible.

# LEVEL roof integrated system

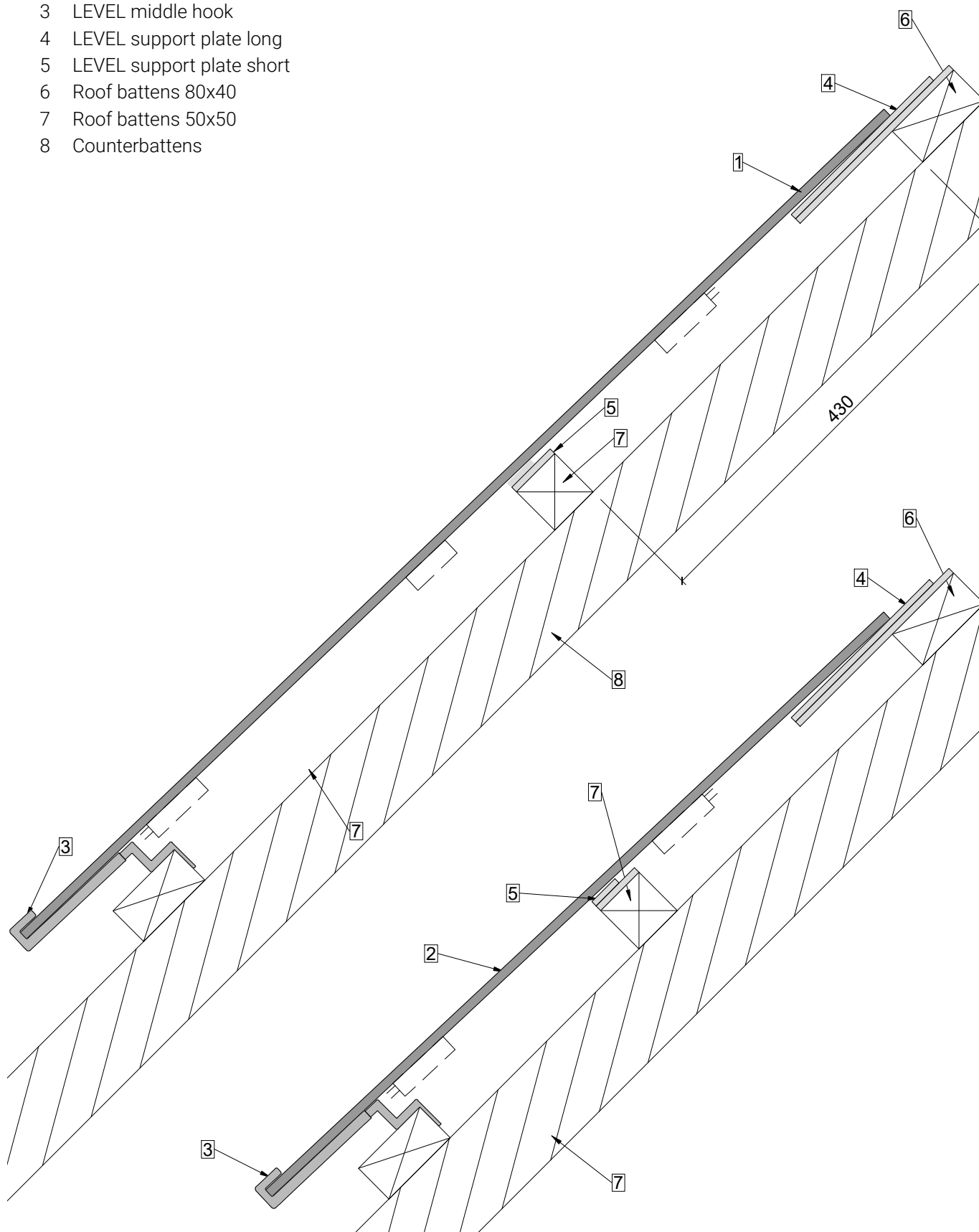
(High performance module)



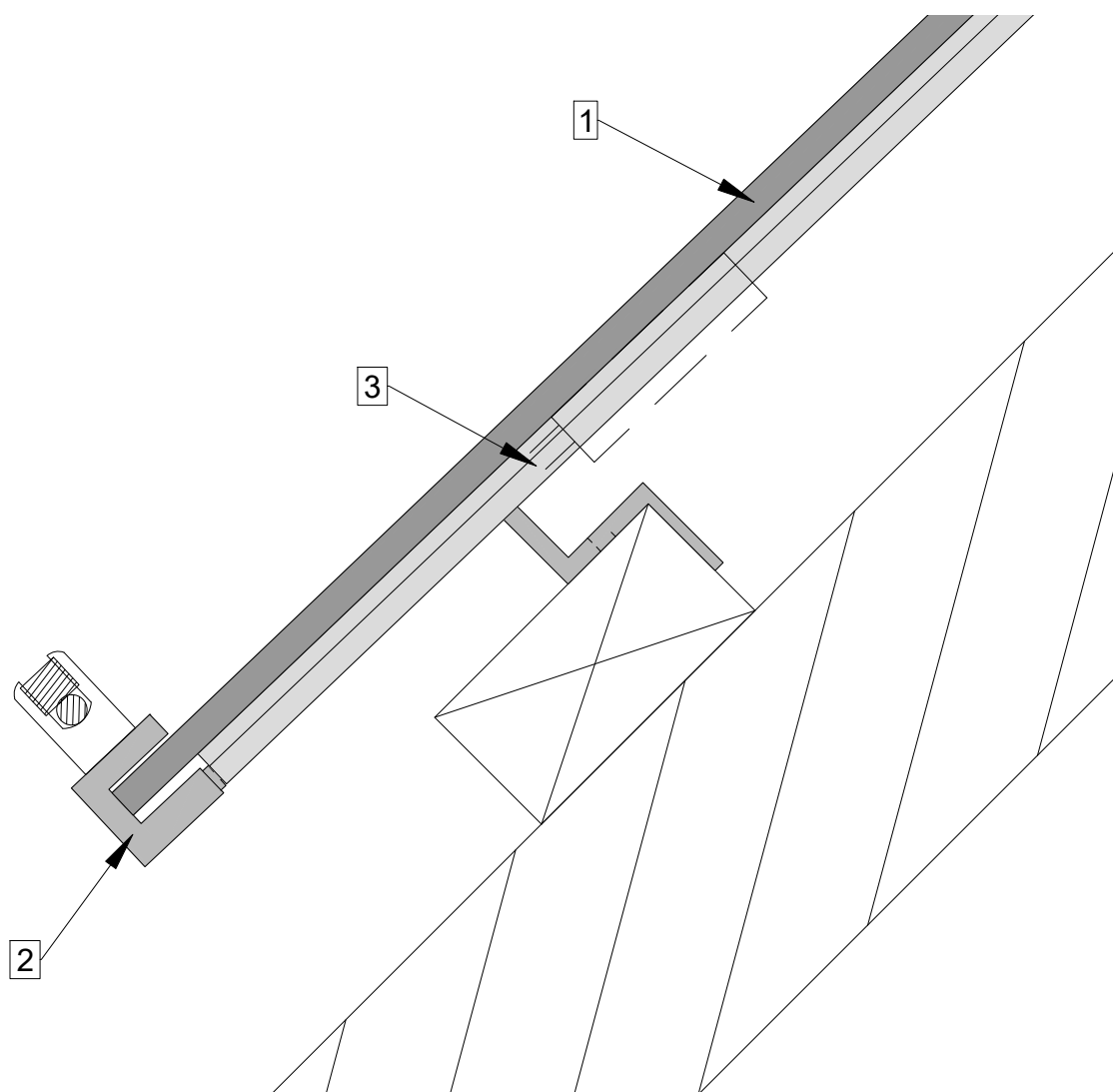
## Support plate

| A4 | 1:5 | V25.01 |

- 1 LEVEL module 1695x1100
- 2 LEVEL module 1695x780
- 3 LEVEL middle hook
- 4 LEVEL support plate long
- 5 LEVEL support plate short
- 6 Roof battens 80x40
- 7 Roof battens 50x50
- 8 Counterbattens



- 1 LEVEL module
- 2 LEVEL rail hook BliSchu (on demand)
- 3 LEVEL rail



Note: Even with careful planning and execution of the lightning protection system, very high voltages can be induced in the PV module in the event of a lightning strike, which can damage the PV module. The LEVEL rail hook BliSchu is a fastening option for the lightning protection wire, which is intended to protect the building if the layout is done professionally. The lightning protection must be laid out by specialists.

### General information on LEVEL and lightning protection:

According to the current opinion of leading lightning protection manufacturers, it is not necessary to integrate the LEVEL rails and hooks into the lightning protection system because the PV modules do not have a metal frame and are made of insulating material (glass). Other metal parts such as end plates, snow guards, etc. must be integrated. However, we would like to point out that the cantonal building insurance company is responsible for interpretation.



# LEVEL roof integrated system

(High performance module)

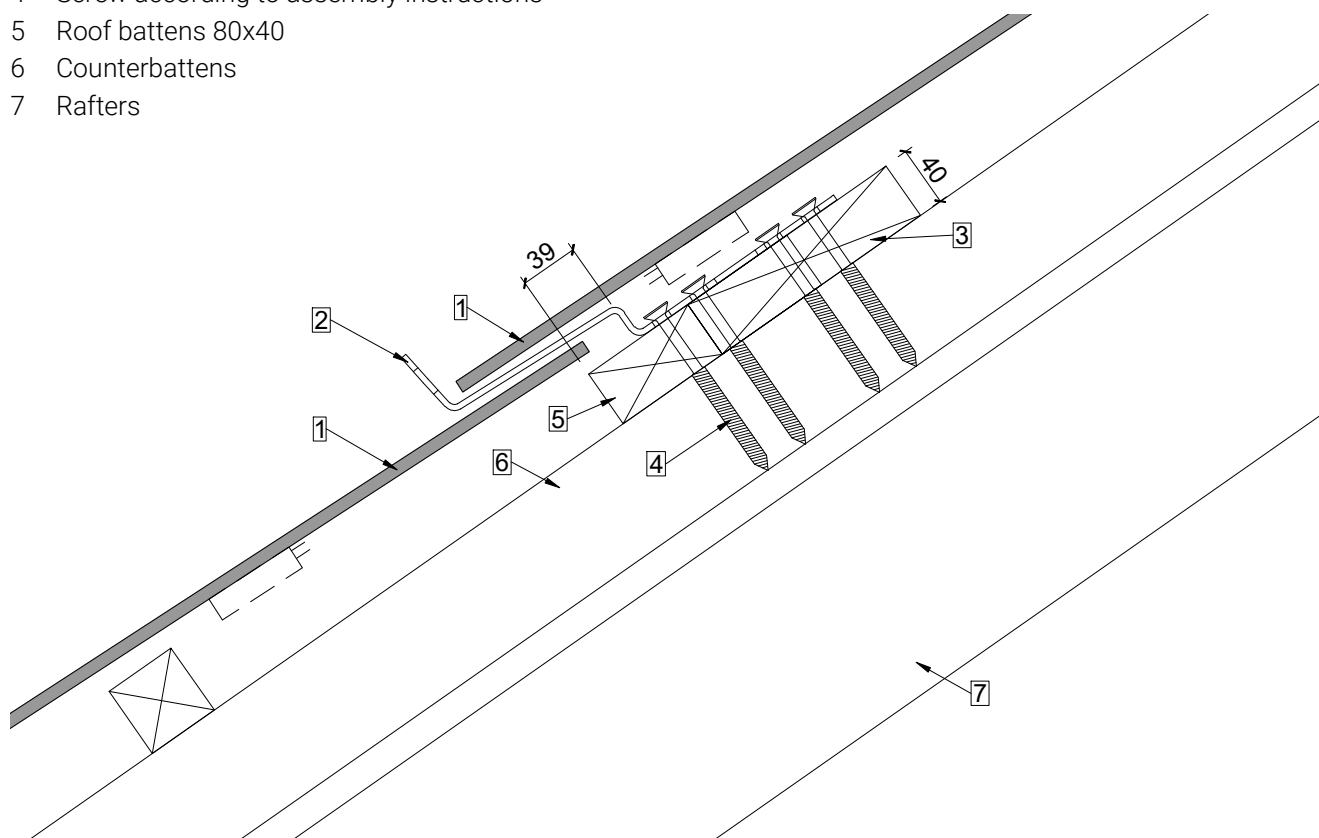


## LEVEL & MATCH slate safety hooks

| A4 | 1:5 | V25.01 |

Certified according to EN 795A:2012 Type A and CEN/TS 16415:2013 for max. 2 persons.

- 1 LEVEL module
- 2 LEVEL & MATCH slate safety hooks
- 3 Wooden board for support
- 4 Screw according to assembly instructions
- 5 Roof battens 80x40
- 6 Counterbattens
- 7 Rafters



**The separate installation and instruction documents supplied must be studied before installation and must be followed exactly. The instructions must be read and understood by the user. The manufacturer's instructions must be strictly adhered to. Failure to do so may result in personal injury.**

**This sheet is not an assembly instruction!**

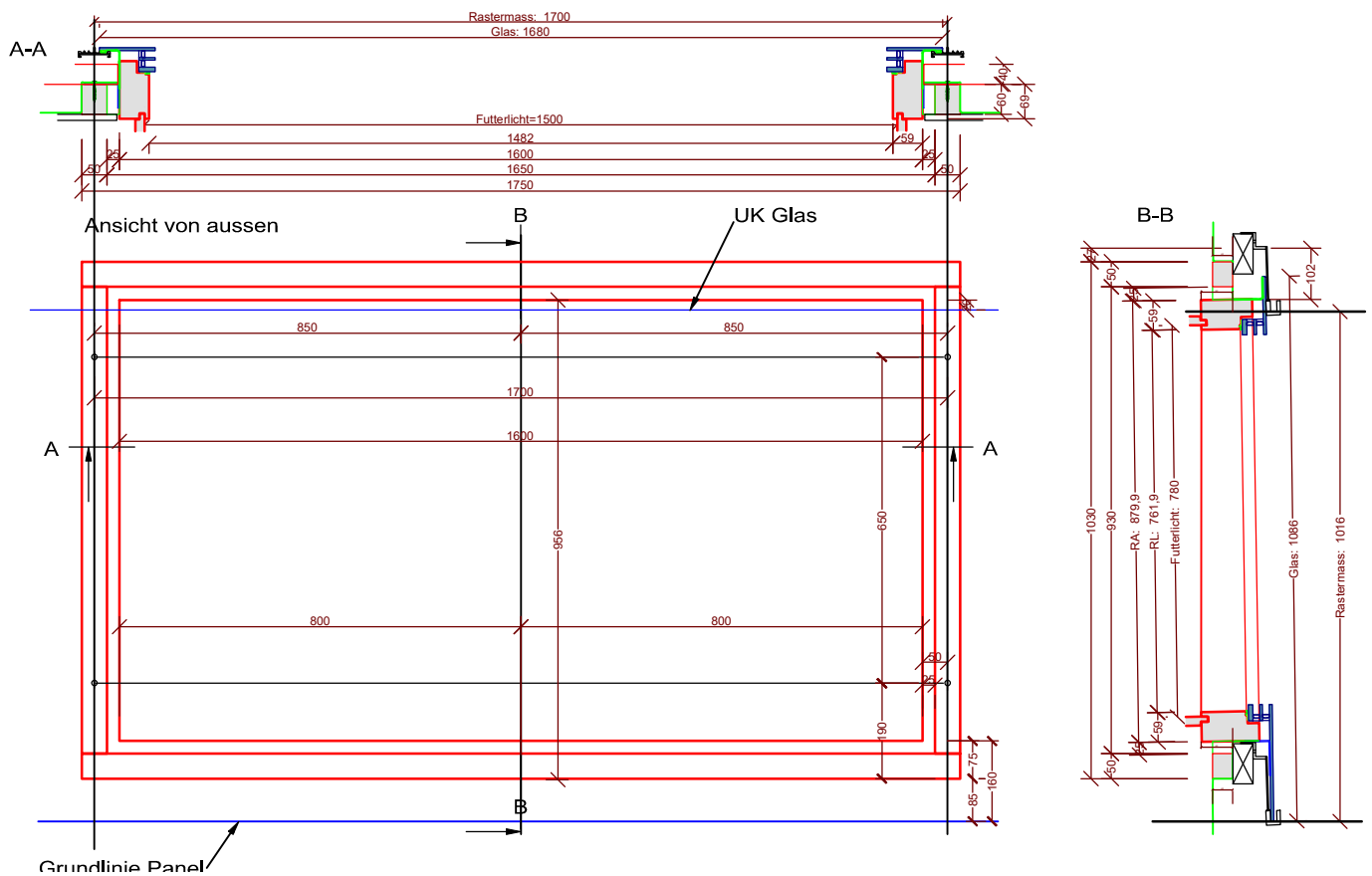
- It is essential to observe the official LEVEL & MATCH slate safety hook notes and assembly instructions.
- It is recommended to place the safety hook in the ridge row.
- Safety hooks in the module field: Insert the module before the next hooks are installed above it.
- The layout must be carried out by qualified personnel in accordance with the applicable local regulations.

# LEVEL roof integrated system

(High performance module)



Wenger roof window - specially developed for the NICERIX 1:5 | V25.01 |



# LEVEL roof integrated system

(High performance module)

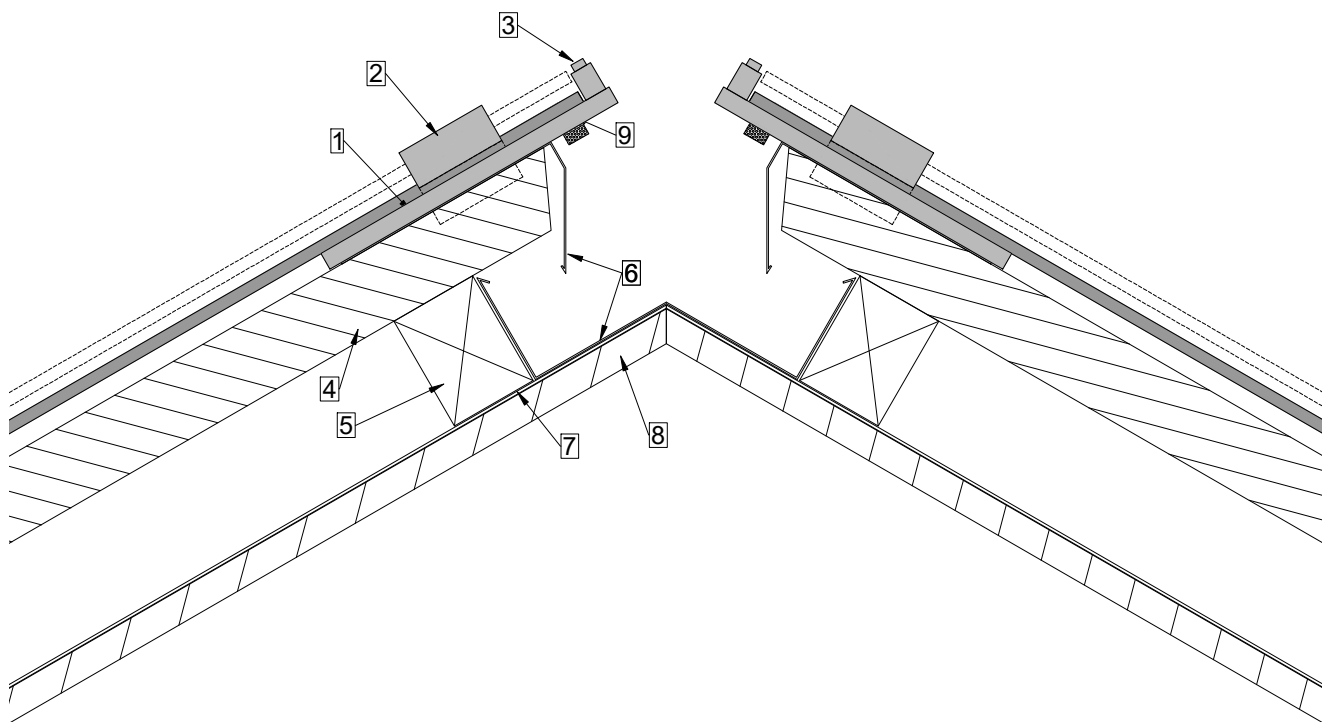
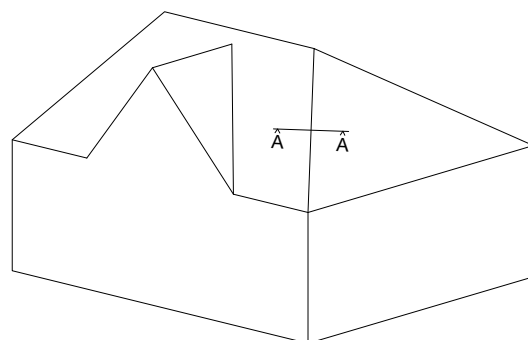


## Hip with tray

| A4 | 1:5 | V25.01 |

**Pay attention to the position of the junction box!**

- 1 LEVEL module
- 2 LEVEL middle hook
- 3 LEVEL side support
- 4 Roof battens 50x50
- 5 Counterbattens
- 6 Tray & Inlet plate
- 7 Subroof
- 8 Shuttering
- 9 Sealing profile (between side supports)



The installation situations shown serve as a suggested solution and orientation. Correct planning and execution must be adapted to local conditions and situations and is the responsibility of the contractor.

# LEVEL roof integrated system

(High performance module)

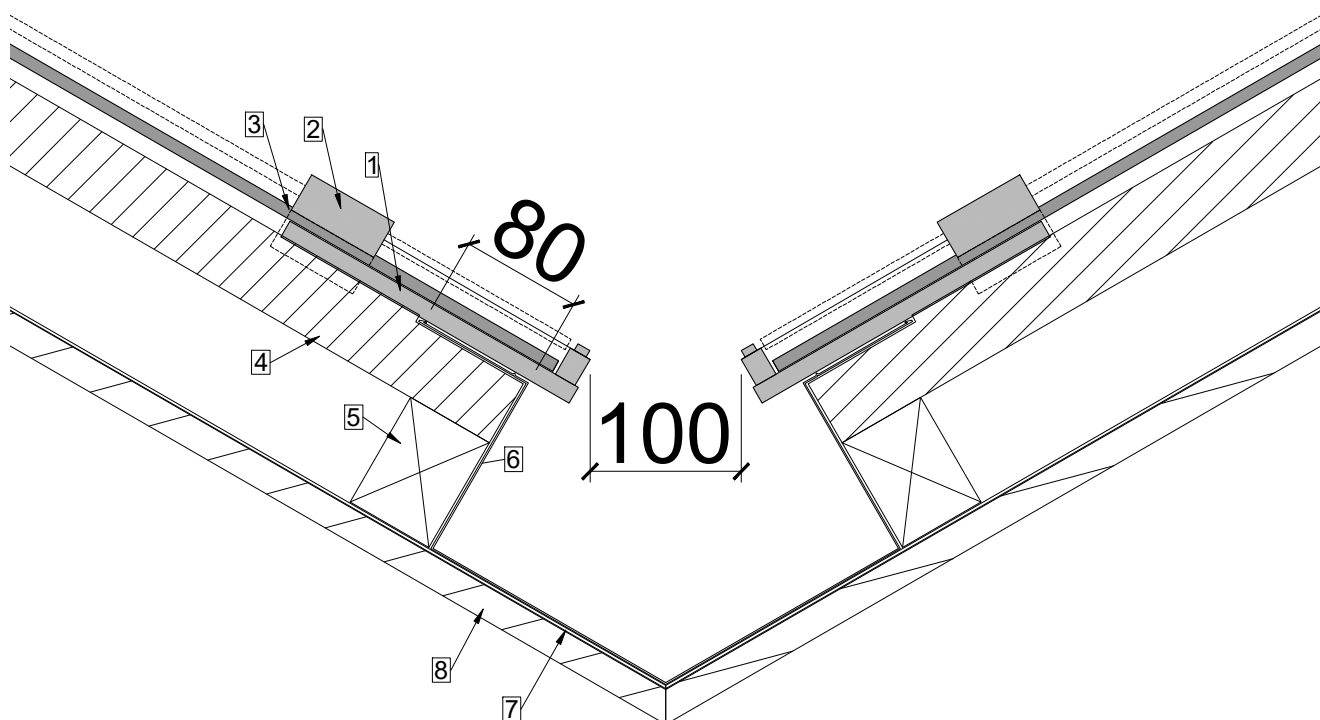
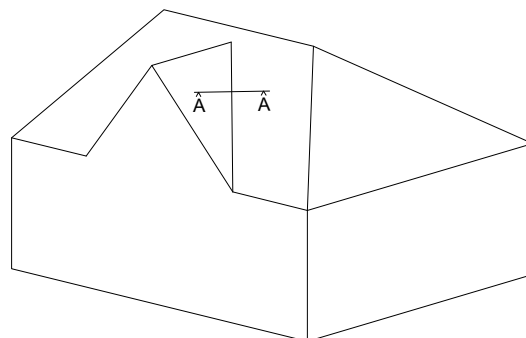


## Valley with tray

| A4 | 1:5 | V25.01 |

**Pay attention to the position of the junction box!**

- 1 LEVEL module
- 2 LEVEL middle hook
- 3 LEVEL side support
- 4 Roof battens 50x50
- 5 Counterbattens
- 6 Tray
- 7 Subroof
- 8 Shuttering



The installation situations shown serve as a suggested solution and orientation. Correct planning and execution must be adapted to local conditions and situations and is the responsibility of the contractor.

# LEVEL roof integrated system

(High performance module)

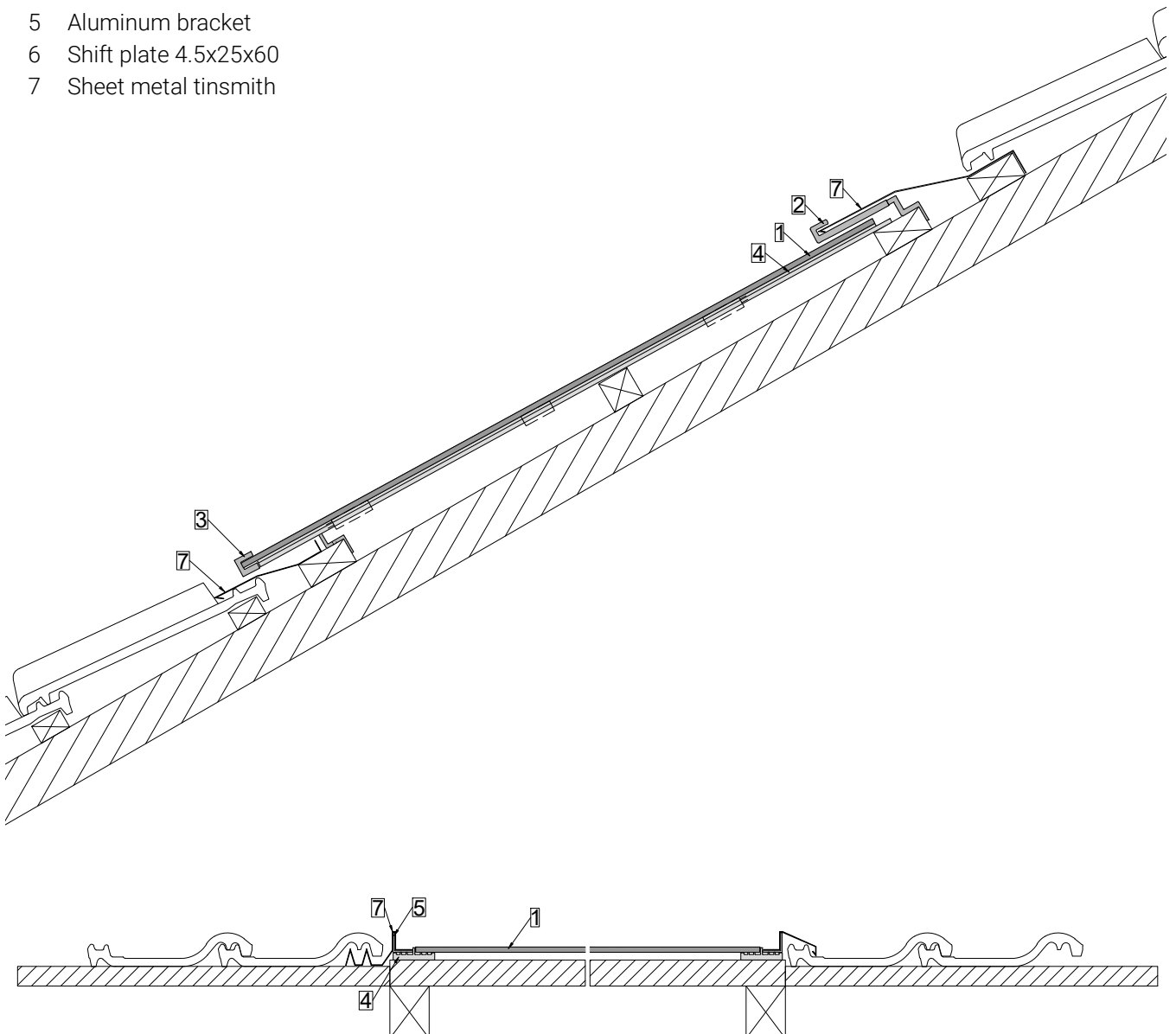


## Proposal tile connection

| A4 | 1:5/10 | V25.01 |

The LEVEL roof integrated system is generally recommended for a full design. If no customized modules are available, these can be replaced with aluminum composite plates. If LEVEL modules are required in the middle of a tile field, the system can be integrated with simple on-site measures.

- 1 LEVEL module
- 2 LEVEL middle hooks
- 3 LEVEL rail hooks
- 4 LEVEL rail
- 5 Aluminum bracket
- 6 Shift plate 4.5x25x60
- 7 Sheet metal tinsmith



The installation situations shown serve as a suggested solution and orientation. Correct planning and execution must be adapted to local conditions and situations and is the responsibility of the contractor.