HORIZONTAL PANEL

System Technology for Facades

DESIGN AND APPLICATION

For up-to-date information, technical reports, advanced technical information,
parts lists, standard details or specifications please visit our website.

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12th edition

Foreword

This document describes the use of RHEINZINK-Horizontal Panels. Although it forms the basis for proper planning and classical application solutions, it is no more than a guide for users. The detailed drawings included here describe solutions which are feasible at a practical level.

We should like to explicitly point out that in actual practice it may not be possible to create the types of cladding illustrated in this document – or not to their full extent. In this context every situation should be examined in detail by the planner in charge. It is necessary here to take account of the system-specific effects on the property and local/climatic conditions as well as the requirements in terms of building physics. Compliance with the application techniques and specifications described here does not release users from any responsibility in this regard.

This document is based on our practical experience and represents the latest findings from research and development, recognised standards and state-of-the-art technology. We reserve the right to make changes at any time in the course of further development.

Please also note our information on the material and its processing on our websites.

If you have any queries or suggestions, please contact your customer advisor or get in touch with your local RHEINZINK sales office. All contact data can be found on our homepage **www.rheinzink.com/contact**

Datteln, May 2020

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RHEINZINK®

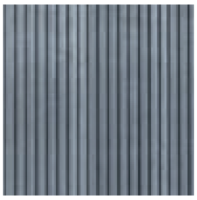
ONE BRAND – 5 PRODUCT LINES

THE PERFECT SOLUTION FOR EVERY REQUIREMENT

bright rolled

RHEINZINK-CLASSIC

ORIGINAL.
EXPRESSIVE.
PATINATES OVER TIME.



CLASSIC

TITANIUM ZINC BRIGHT ROLLED: PATINATES OVER THE YEARS. NATURAL, VARIABLE SURFACE CHARACTER.

blue-grey

graphite-grey

RHEINZINK-prePATINA

PRE-WEATHERED.
SELF-HEALING.
NATURAL.

prePATINA

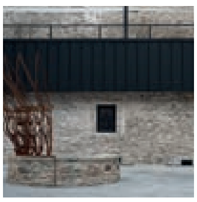
THE ONLY NATURALLY PRE-WEATHERED SURFACE IN THE WORLD. ZINC TYPICAL PATINA EX WORKS. 100% NATURAL, 100% RECYCLABLE.

- skygrey
- basalte

RHEINZINK-GRANUM

NOBLE.
MATTE FINISH.
MULTIFACETED.

GRANUM



SKYGREY AND BASALTE. PURE, GREY ELEGANCE. URBAN DESIGN. PHOSPHATED SURFACE WITH COUNTLESS DESIGN OPPORTUNITIES.

- gold
- brown
- blue
- red
- green
- black

RHEINZINK-PRISMO

GLAZED.
DYNAMIC.
ADAPTABLE.

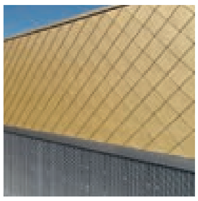
PRISMO

AESTHETIC, HARMONIOUS MATCH WITH ITS SURROUNDINGS. SUBTLE COLOUR VARIETY FOR A UNIQUE LOOK. SEMI-TRANSPARENT.

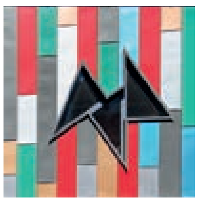
- pure-white
- pearl-gold
- moss-green
- nut-brown
- blue
- tile-red
- black-grey

RHEINZINK-artCOLOR

COLOURFUL.
LIVELY.
CREATIVE.



artCOLOR



CREATIVE DESIGN POSSIBILITIES. INDIVIDUAL, EXPRESSIVE COLOUR COMPOSITIONS. COATED COLOUR VARIETY.

BUILDING PHYSICS

1. Function of rear-ventilated Facades

- **Windproof Building Envelope**
- **Weather Protection**
- **Moisture**
- **Thermal Economy**
- **Fire Protection**
- **Rear-Ventilation**
- **Air Intake and Exhaust Openings**
- **Soundproofing**

The rear-ventilated facade is a multi-layered system, which, when designed properly, guarantees permanent functional capability. By functional capability, we mean that all requirements pertaining to structural physics are met. This is described in detail below.

By separating the rainscreen facade from the thermal insulation and supporting structure, the building is protected from the weather.

he supporting outer walls and the insulation remain dry and thus fully functional. Even when driving rain penetrates open joints, it is quickly dried out as a result of the air circulation in the ventilation space. The bracket-mounted rear-ventilated facade protects the components from severe temperature influence. Heat loss in the winter and too much heat gain in the summer are prevented.

Thermal bridges can be reduced considerably.

In the case of rounded parapets and dormer girders, the substructure and thermal insulation should be protected from penetrating moisture with a suitable layer.

1.1 Windproof Building Envelope

This does not apply to the rear-ventilated facade, as this component itself cannot be windproof.

The building must be windproof before the rear-ventilated facade is installed. A solid brick or concrete wall will ensure that the building is windproof. Penetrations (e.g. windows, ventilation pipes, etc.) must be sealed from the building component to the supporting structure. In the case of a skeleton construction, the wall surface must also be sealed.

If the building envelope is improperly sealed (wind suction, wind pressure), there is a high degree of ventilation/energy loss, which, along with drafts, creates unpleasant room temperature. Dew or condensation can be expected on the leeward side of the building.

Air circulation in the room should be provided through air conditioning or by opening the windows.

1.2 Weather Protection

Rear-ventilated facade cladding protects the supporting structure, the waterproofed thermal facade insulation, and the substructure, from the weather.

Bracket-mounted rear-ventilated facades provide a high degree of protection from driving rain.

Because of the physical structure, it is impossible for the rain or capillary water transfer to reach the insulating layers. Furthermore, moisture can always be drawn out through the ventilation space. This allows the insulating layers to dry out quickly, without impeding thermal insulation.

1.3 Moisture

Rear-ventilated facade cladding provides protection from driving rain and moisture. Moisture penetration as a result of diffusion does not occur in the rear-ventilated facade.

When the supporting structure is windproof, the diffusion current density is too small to cause the dew point temperature to drop.

1.4 Thermal Economy

In order to understand the thermal economy of the rear-ventilated facade, we must first consider the various heat flow rates, as well as the air exchange between the rear-ventilation space and the outside air, separately, in terms of structural physics.

1.4.1 Thermal Insulation

In the winter, heat flow from the inside to the outside is referred to as a heat transfer co-efficient (U-value).
The smaller the value, the smaller the quantity of heat escaping to the outside. The U-value is determined by the heat conductivity of the thermal insulation and insulation thickness.

The high-grade thermal insulation is a contribution to environmental protection and pays for itself in a relatively short period of time through low heating costs.

1.4.2 Summer thermal Insulation

Summer thermal insulation should provide comfort: The amount of heat flowing from the outside to the inside sh ould remain as small as possible. Proper thermal insulation, as well as a certain mass in the construction itself, will help to achieve this objective.
The advantage of a bracket-mounted, rear-ventilated facade, is that a large portion of the heat which streams onto the cladding is diverted through convective air exchange.

1.4.3 Thermal Bridges

Thermal bridges are elements of the building envelope, that have high thermal conductivity (have high U-values) and are continuous from the warm side to the cold side of the thermal insulation. Apart from general design-dependent thermal bridges of a building, e.g. protruding balconies, the installation of the substructure must be taken into account in the case of a rear-ventilated facade. Thermal bridges can be reduced significantly by installing an insulating strip between the supporting structure and the substructure (thermal break).
Proper installation of the insulation reduces the formation of thermal bridges.

1.5 Fire Protection

Metal facades with a metal substructure and appropriate fasteners meet the highest requirements for non-combustibility (Building Material Class A1, DIN 4102). In the case of bracket-mounted, rear-ventilated facades, it may be necessary to install firestops.

1.6 Rear-Ventilation

The free ventilation cavity between the facade cladding and the layer behind it must be at least 20 mm. Tolerances and plumbness of the building must be taken into account. In some places, this rear-ventilation space may be reduced locally up to 5 mm – e.g. by means of the substructure or the unevenness of the walls.

1.6.1 Air Intake and Exhaust Openings

The rear-ventilation space requires intake and exhaust vent openings. These openings must be designed so that their functionality is guaranteed for the lifetime of the building. It cannot be hindered through dirt or other external influences. The openings are located at the lowest and highest point of the facade cladding, as well as in windowsill and window lintel areas, and penetrations. In the case of higher, multi-storey buildings, additional intake and exhaust vent openings should be provided (e.g. at each floor).

1.7 Soundproofing

To prove that a facade design is soundproof, the entire wall structure, as well as each building component (windows, etc.) must be defined. The use of proper static fasteners will prevent any potential noise development as a result of the cladding.

2. RHEINZINK-Horizontal Panel H 25
Using the horizontal panel, the designer has the option of realizing grid dimensions up to 6000 mm in length. The width of the shadow joint is fixed at 20 mm.
The horizontal panel is available in widths of 200-333 mm.

Technical Approval
The Rheinzink-Horizontal Panel System is subject to EN 14782 and is approved for use with substructure spacing ≤ 1.00 m (other support spacing possible on request). In Germany the facade system is additionally governed by the Construction Products List B, Part 1 (edition 2015/2), section 1.0 relating to construction products subject to harmonised standards according to the Construction Products Directive, section 1.4.10.1 Self-supporting roof covering and wall cladding elements for interior and exterior application made of sheet metal.

Span Calculation
Span tables for profiles are based on DIN 18807 for cross-sectional values.
Deflection:
1/180 for facade components
Safety factor:
g = 1,50
(taken into account in tables)

Units for Loads and Strength
Permissible loads and force are given in kN/m² in the calculation tables.
Deflection values in relation to span width are given for single-, double- or multiple-span conditions.
The following symbol is used in the illustration:
Single-span ■
Double-span ■■
Multiple-span ■■■

Span width in m		0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50
Permissible wind load in kN/m²	■	3.54	2.80	2.27	1.87	1.56	1.33	1.15	1.00
	■■	1.85	1.65	1.48	1.35	1.23	1.13	1.05	0.98
	■■■	2.10	1.87	1.68	1.53	1.40	1.30	1.20	1.11

H 25 - 200, s = 1,00 mm

	■	2.12	1.68	1.36	1.12	0.94	0.80	0.69	0.60
	■■	1.11	0.99	0.89	0.81	0.74	0.68	0.63	0.59
	■■■	1.26	1.12	1.01	0.92	0.84	0.78	0.72	0.67

H 25 - 333. s = 1.00 mm

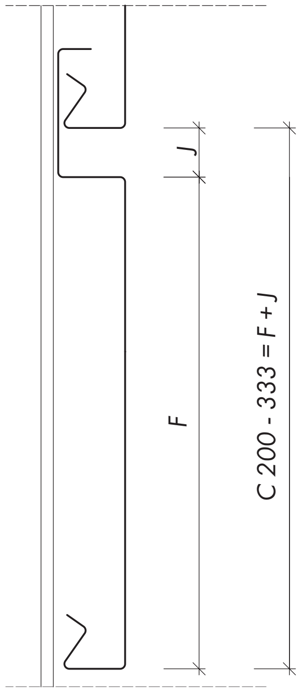
Span width in m		0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50
Permissible wind load in kN/m²	■	3.92	3.10	2.50	2.07	1.73	1.48	1.28	1.11
	■■	2.03	1.82	1.65	1.48	1.36	1.25	1.16	1.03
	■■■	2.32	2.07	1.85	1.68	1.55	1.43	1.33	1.23

H 25 - 200, s = 1,20 mm

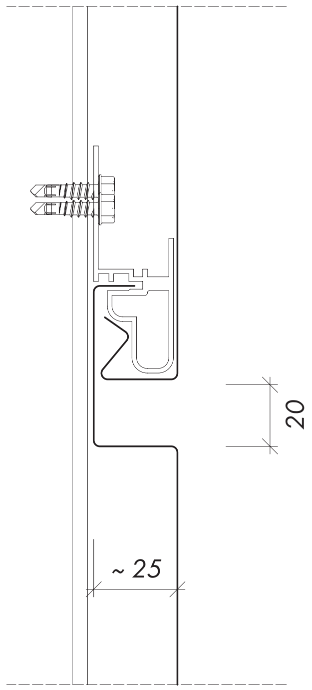
	■	2.35	1.86	1.50	1.24	1.04	0.89	0.77	0.67
	■■	1.22	1.09	0.99	0.89	0.82	0.75	0.70	0.62
	■■■	1.39	1.24	1.11	1.01	0.93	0.86	0.80	0.74

H 25 - 333, s = 1.20 mm

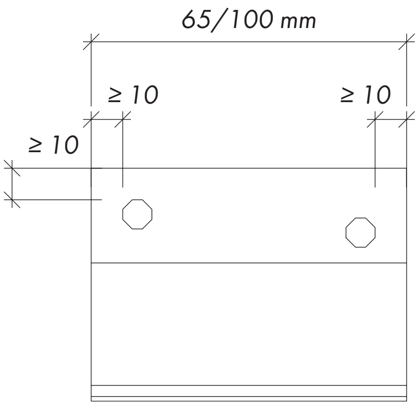
Table 4: Calculation table for horizontal panel (intermediate values between building widths can be interpolated)
Basis for calculation: uniformly distributed load including profile dead load
Safety factor: 1,50
Yield limit: 100 N/mm²
Width of support profile: ≥ 50 mm
DIN 18807/experimental testing at the University of Karlsruhe, Germany



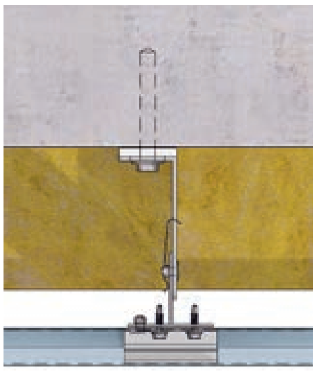
System section: grid



System section: illustration of installation allowing linear expansion



Minimum spacing for fasteners (special steel self-tapping screws or rivets) at the RHEINZINK-Cast Fixing Clip



Clips, aluminium (RHEINZINK-Cast Fixing Clip)

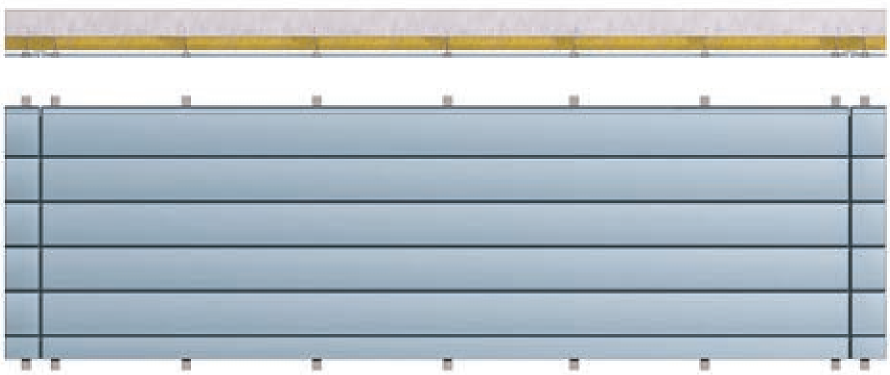


Illustration of a multi-span system

2.1 Profile Geometry

Material thickness
s = 1.00 mm/1.20 mm

Cover widths H 25	Weight
s = 1.00 mm	
200 mm	11.20 kg/m^2
225 mm	10.70 kg/m^2
250 mm	10.40 kg/m^2
s = 1.20 mm	
250 mm	12.17 kg/m^2
300 mm	11.58 kg/m^2
333 mm	11.28 kg/m^2

Cover widths from 200-333 mm
All sizes between in mm increments can be produced.
For widths of over 250 mm, we recommend using a material thickness of 1.20 mm.

Application for outside Areas

- Facades
- Soffits
- Rounded parapets

Fasteners

The panels are screwed/riveted to the substructure through the RHEINZINK-Cast Fixing Clip. 2 fasteners must be used per clip. The location is secured by fixing the centre of the panel with appropriate fasteners.

Dimensions

- Drawings: Dimensions in mm
- Panel markings: H 25 - 287 (Example)
- Standard length: ≤ 6000 mm
- C: Cover width = bay width
- J: Joint width
- F: Face width

Tolerances

According to RHEINZINK works standard

Installation Tips

- Boxed ends should be used at both ends of the panel for reinforcement.
- Panels (C) are manufactured with a minus tolerance of 1,00 mm smaller than ordered.

2.1.1 RHEINZINK-Horizontal Panel, Installation

RHEINZINK-Panel H 25 with shadow joint profile

Private Residence, Straden, Austria

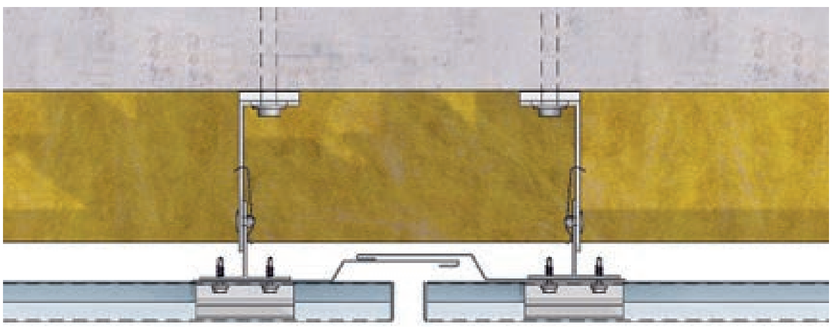
RHEINZINK-Panel H 25 with 20 mm joint and slave profile

Office building, Reykjavik, Iceland

A

B

C



D

2.2 Joint Formation

2.2.1 Horizontal Installation

2.2.1.1 Vertical Joint

A: Slave Profile with boxed Ends

A slave profile corresponding to the panel geometry is installed behind the joint. Aesthetically speaking, this is a very conservative joint design, accentuating the horizontal orientation of the panels.

B: Joint with closed Panel

The panels are terminated with a lateral fold (boxed end) in order to prevent one from seeing into the profile and to lend greater stability to the profile.*

C: Joint profile using random structure

The staggered vertical joints make the facades come to life. By using custom profiles, the joints take the formation of shadow joints.

D: Shadow Joints

Vertical joints serve to separate the individual panel fields through expansion.

Note:

- Generally speaking, the joints should be dimensioned 5-10 mm bigger than the anticipated thermal expansion.

* If the cover width is 250 mm or greater, it is recommended that panel ends be terminated with boxed ends

THERMAL EXPANSION

2.3 Accommodating thermal Expansion of Facade Cladding

- Thermal expansion of facade profiles is accommodated by using expansion joints.
- Static continuous fields longer than 6000 mm are not permitted.
- In those joints, which will accommodate thermal expansion, the substructure must have an appropriate fastening system.
- The substructure must be designed/ formed separately for each facade field in the area of the expansion joint. Exceptions must be discussed and coordinated with the Department of Application Engineering or you local consultant.*.

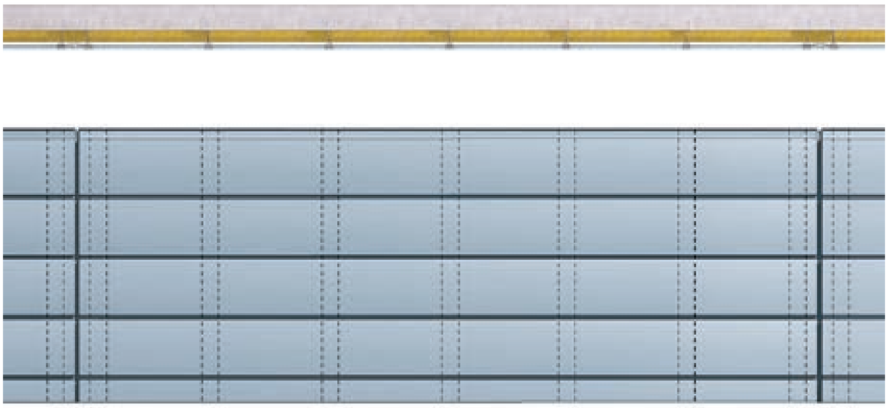
Two examples of facade design illustrate the correlation:

Example A
Large cladding components each form a field, which is fastened separately from the next field, by means of an expansion joint.

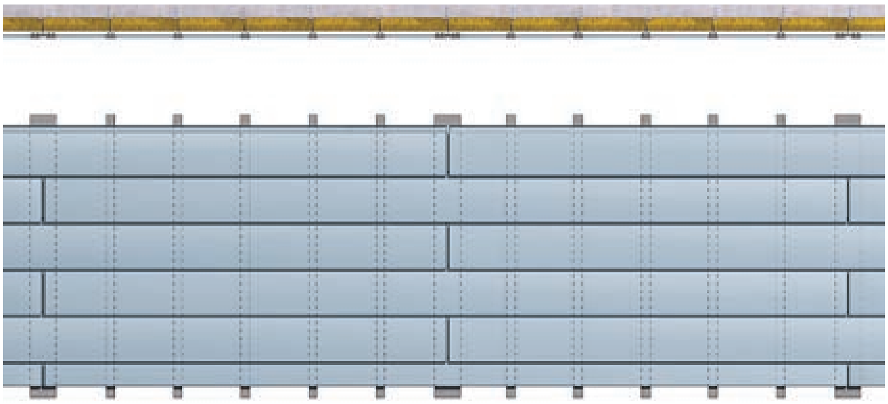
Example B
This type of cladding is characterized by the installation of semi-staggered vertical joints. If the substructure is designed properly, a double substructure in the joint profile area is no longer required. This type of installation is only possible with indirect fastening H 25, but not with a reveal panel that has been fastened directly.

When installing support profiles (horizontal panel brackets), please note that the Y dimension should always be 5 mm bigger than the calculated dimension for contracted panels.

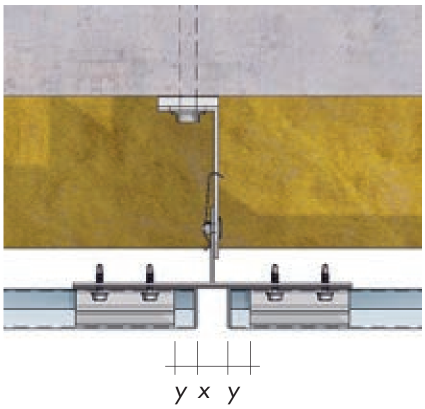
* see www.rheinzink.com



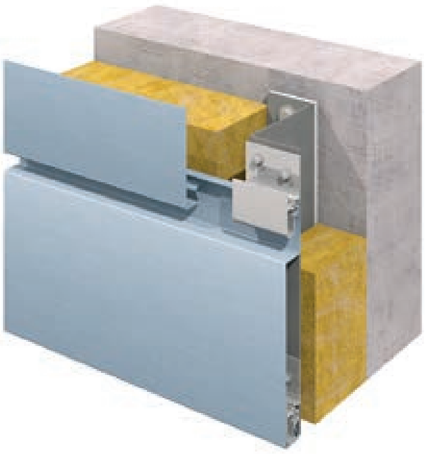
Example A



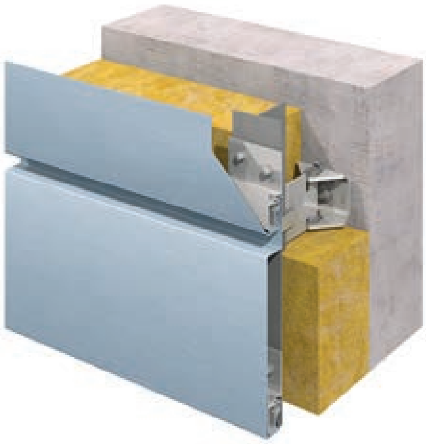
Example B



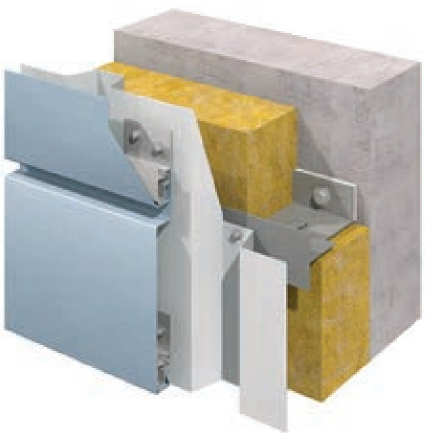
Example B details



Single substructure



Two-part substructure



Multi-part substructure

2.4 Substructures
RHEINZINK facade systems are typically installed on substructures comprising single, two or multi-part NE metal systems. Apart from structural and economical advantages, these systems guarantee control of fastening patterns, compliance with fire protection specifications and problem-free compensation of building tolerances when two or multiple systems are used.
The architectural appearance of the profiles determines the design of the substructure. Prior to designing the substructure, the overall design must be determined. Otherwise the design will determine the architecture – which could be avoided in this case.

Note:
Due to moisture retention and problems when adjusting tolerances, we do not recommend using wood as a substructure for large facade surfaces.
For small-surface applications such as dormers, fascias and gable cladding, a dry wood substructure is definitely suitable.
The location and alignment of sliding and fixed points for metal substructures is determined based on the type of cladding, as well as the surface and length of the panels.

For single systems, the disadvantages outweigh the advantages, among others:
- great effort when accommodating building tolerances
- large thermal bridges

Technical problems are solved when using two- or multi-part systems:
- local thermal bridges only
- continuous rear-ventilation is guaranteed.

However, the high cost of design and the fact that two or more installation sequences must be carried out, should be taken into account.

Two-part systems are the "happy medium":

Advantages:
- cost-effective
- building tolerances are easily accommodated
- local thermal bridges only

Disadvantages:
- two installation sequences
- high cost of design, depending on the detail

2.5 Fasteners

Fasteners are parts that connect the cladding to the substructure mechanically.
The edge distance of connections and fasteners in the substructure must be at least 10 mm. Only corrosion-resistant fasteners, which guarantee long-term function capability, may be used.

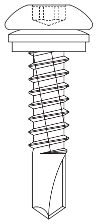
2.5.1 EJOT® Drilling Screws

Area of Application

Drilling screws to join
- RHEINZINK-Cast Fixing Clip

onto
- steel substructures
- 1,5 - 4,0 mm
- aluminum substructures
- 1,5 - 4,0 mm

JT 3 - FR - 6 - 5,5 x 25 - E11



Marking	Ø x mm	Length mm	Drill capacity $t_I + t_{II}$ mm	Clamping thickness mm
JT3 - FR - 6	5.5 x	25	min. 0,63 + 1,5 max. 2,0 + 4,0	0 - 7.0

2.5.2 EJOT® Blind Rivet with large Collar

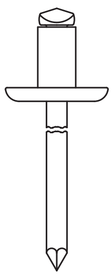
Aluminum (Al) rivet sleeve
Rivet mandrel made of high-grade steel
Secure connection

Area of Application

Use blind rivets to fasten
- RHEINZINK-Cast Fixing Clip
- steel or aluminum profile sheets

onto
- steel substructures
- aluminum substructures

Blind Rivet K14 - Al/E - 5,0 x 8,0



Marking	Ø x mm	Length mm	Clamping thickn. mm	Drill hole Ø mm
Blind rivet K14 - Al/E -	5.0 x	8.0	2.5 - 4.5	5.1
	5.0 x	10.0	4.5 - 6.0	5.1
	5.0 x	12.0	6.0 - 8.0	5.1
	5.0 x	18.0	12.0 - 14.0	5.1

Note
Use a rivet gauge when creating sliding points.

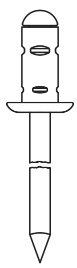
2.5.3 EJOT® Blind Rivet

Aluminum (Al) rivet sleeve
Rivet mandrel made of high-grade steel
Secure connection

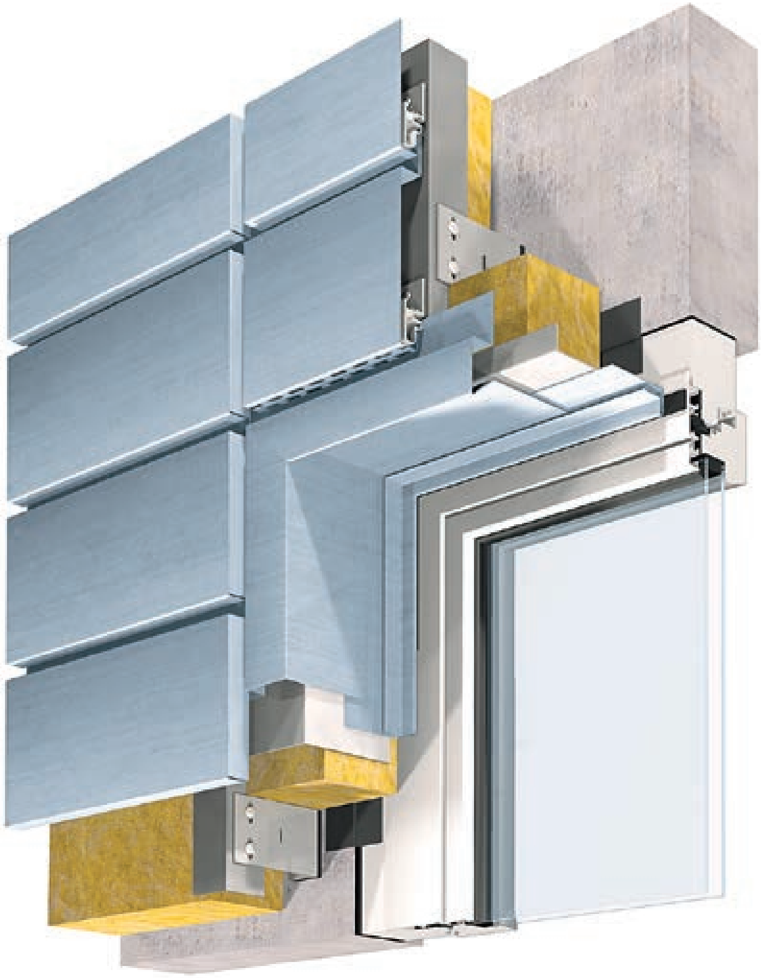
Area of Application

Blind rivets are used to fasten secondary components, e.g. slave profiles.

Blind Rivet Al/E - 4,8 x 10



Marking	Ø x mm	Length mm	Clamping thickn. mm	Drill hole Ø mm
Blind rivet Al/E -	4.8 x	10.0	0.5 - 6.5	4.9
	4.8 x	15.0	4.5 - 11.0	4.9
	4.8 x	25.0	11.0 - 19.5	4.9



Profile group 1

2.6 Detail Concept
Detail design has a formative influence on the facade. Building profiles are required for most corners, flashings, connections and terminations. These must be coordinated when working out the detail concept. Two significant design variations will illustrate this.

Face Width of Building Profile
The spectrum ranges from sharp-edged profiles to profiles that are several centimetres wide. Precise planning gives one the option of making the width of all termination and frame profiles the same, or to vary these proportionately as desired.

Projection of Profiles
Depending on the detail concept, profiles can either be flush with or protrude from the facade.

The overview illustrates two possible flush principles:

Profile Group 1
A relatively wide pilaster profile (face width ca. 60 mm) was selected for the building profile, which is terminated flush with the facade level. The edge profile, selected as the pilaster profile, is used as a flashing, in coordination with the window sill and window lintel.

Profile Group 2
This version of a corner panel forms the window flashing, accentuating the horizontal line, without any disruption in the window area.

Profile group 1

Profile group 2

2.7 Details

2.7.1 General Instructions

Third Party Trades
Connections of facade claddings to third party trades are necessary and unavoidable in most cases to ensure impermeability. Because of the warranty obligations on the part of the craftsman, sub-contracting connections and fasteners to third party trades (e.g. windows), must always be approved by the project manager of the trade in question.
Please keep the location of the scaffold anchors in mind during planning/design.

Wall Construction
Layered construction is commensurate with a rear-ventilated metal facade. A solid brick or concrete wall serves as the supporting structure. Of course, it can also be substituted with a column or steel support structure.

Substructure
see chapter 2.4

Load Effect
If buildings are situated in exposed areas, boxed ends are required on all flat cladding profiles (all panel types) that are only fastened on one side, in order to provide additional reinforcement.

Installation Instructions
Detailed discussion pertaining to installation sequences has been left out deliberately, because in practical terms, these are heavily influenced by the supporting trades such as window and steel construction, etc.
Installation sequences should be determined separately for each project, taking into account the interfaces and installation sequence for each project. Noteworthy deviations are pointed out for different details.

Drip Edges
The requirements as set out by standards and regulations must be taken into account for detail design, for example, drip edges over stucco facades (soiling as a result of atmospheric deposits).

2.7.2 Pictogram

Horizontal sections (see chapter 2.11)
H1: Outside corner
H2: Inside corner
H3: Window jamb
H4: Joint/lengthwise expansion separation

Vertical sections (see chapter 2.12)
V1: Base
V2: Windowsill
V3: Window lintel
V4: Roof edge

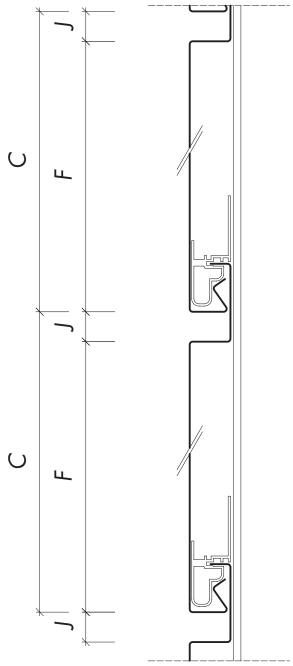
Variations
In some cases, variations are shown for the same detail (e.g. window lintel with/without sun shade). These are identified and explained with additional text or drawings.

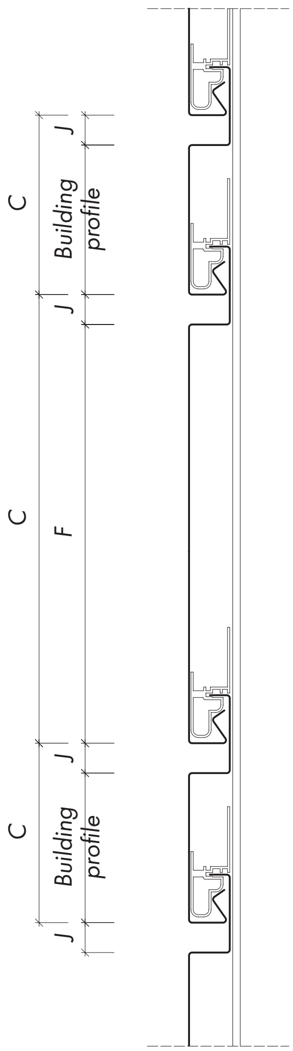
Applicability
The details and designs outlined here are suggestions, which were carried out on various projects. The detail suggestions must always be coordinated responsibly, taking into account applicable standards and stipulations, as well as the designer's intentions for the project.

Building height	Drip edge distance mm	Dripe edge dictance to rendering mm	Cover required
h < 8	≥ 20	≥ 40	≥ 50
8 ≤ h ≤ 20	≥ 20	≥ 40	≥ 80
h > 20	≥ 20	≥ 40	≥ 100

Drip edge distances and overhang dimensions for copings and flashings.

* The overhang dimensions also apply on the roof side. If the roofing foil is routed to the front edge of the facade without interruption, 50 mm overhang generally apply independent from the building height.





2.8 Planning Grid

A metal facade consists of components, which have been industrially manufactured with high degree of production precision. These components determine the aesthetics through precise horizontal and vertical segmentation. Penetrations and terminations, which are not coordinated with the axial segmentation, are obtrusive.

The following instructions serve to provide for proper planning of facade segmentation:

Principles

Generally speaking, a distinction must be made between new buildings and renovations when discussing grid difficulties.

In the case of new buildings, the facade grid can be matched to the design; penetrations such as windows, chimney pipes, etc. are always ancillary to the grid.

However, when it comes to renovations, the penetrations (e.g. windows) are immovable, so that the grid must be coordinated.

The following principles apply to grid deviations:

- One should start or end with a whole module (x or y) at the transitions
- Dimensional discrepancies of maximum 15 mm on two-dimensional profiles wider than 250 mm, are not noticeable.
- Dimensional tolerances (dimensional change of y) which cannot be corrected, must be compensated in the windowsill or roof edge area.
- Adaptations or displacements of grid heights (height coordinates)can only be carried out in the roof edge and/or base area.

The principles of facade segmentation will be illustrated and explained using a grid for horizontal cladding. This principle also applies to vertical facade cladding (e.g. reveal panel).

- B: Bay width
- C: Cover width = bay width
- J: Joint width
- F: Face width

Module Y

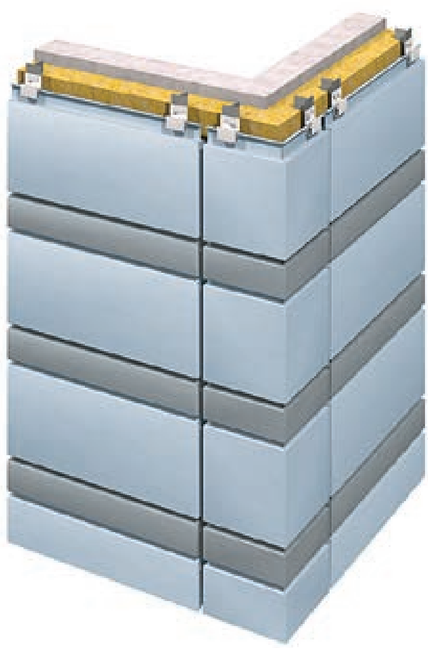
Y corresponds to the smallest unit of the facade segmentation, which repeats itself, e.g. panel width. Grid module Y determines the precise location of penetrations and transitions. In the case of horizontal panels, dimension Y can be produced with cover widths of 200 mm to 333 mm, depending on the project.

The bay width (Y) is determined by the face view of the panel and shaped in each case by a shadow joint.

The bay width = cover width is determined by the visible surface and joint width. Joint width is fixed at 20 mm.

Dimension X

All of the segments marked with an X are a whole multiple of the selected module Y and, as a rule, correspond to the cover width of a profile.



Combination of panels and building profiles

Position Z_4: Roof Edge

Grid Planning for new Buildings, respectively Renovations

If the height coordinates of the roof edge do not fit into the grid, the following corrective measures may be selected:

- Change the roof edge profile/ incline
- Lower or raise the parapet or the roof edge frame.

As a rule, both of these possibilities only exist if the flat roof is being renovated at the same time.

- Changing module X or Y

Position Z_3: Window Lintel
Position Z_2: Windowsill
Grid Planning for new Buildings

- Determine recess of unfinished structure.
- Establish window frame profiles.
- Establish location of window.
- Establish profile geometry of window connections.
- Develop design details within the grid.

Grid Planning for Renovation Projects

- Establish window frame profile, new/old
- Establish location of window, new/old
- Establish the profile geometry of window connections.
- Establish design details within the grid.

If the location of the window or detail does not fit into the grid, the following corrective measures may be selected:

- Change the profile geometry of the window lintel profile or the windowsill.
- Adapt to the height of the window.
- Change the incline of the windowsill
- Change the Y module.

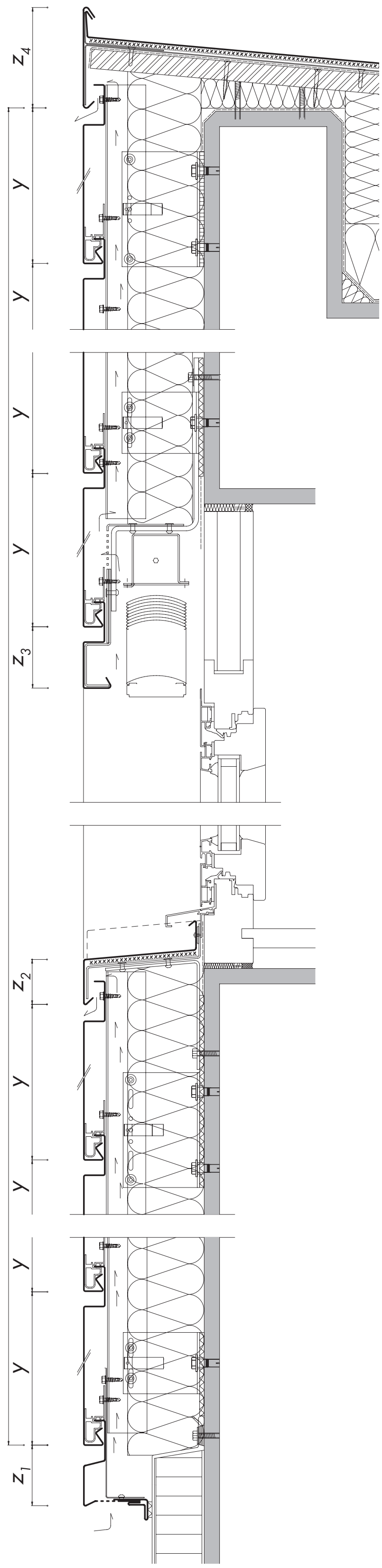
Position Z_1 : Base

Grid Planning for new Buildings, respectively Renovations

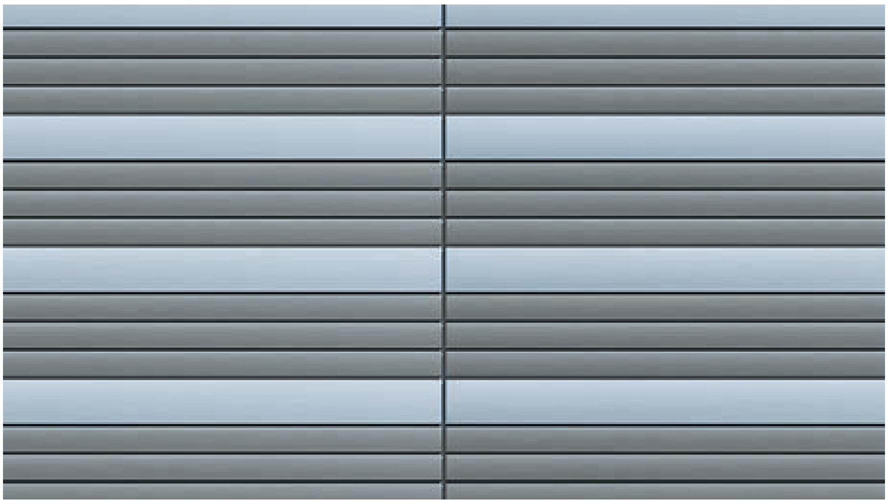
- Define potential deviations toward the top or the bottom.
- Establish the profile geometry of the base detail

If the location of the base does not fit into the grid, the following corrective measures may be selected:

- Move the facade connection toward the top or the bottom.
- Change the profile geometry of the base profile.
- Lower or raise the base brickwork, if it has been planned for or if it already exists.



½ staggered cladding accentuated by two-coloured surfaces

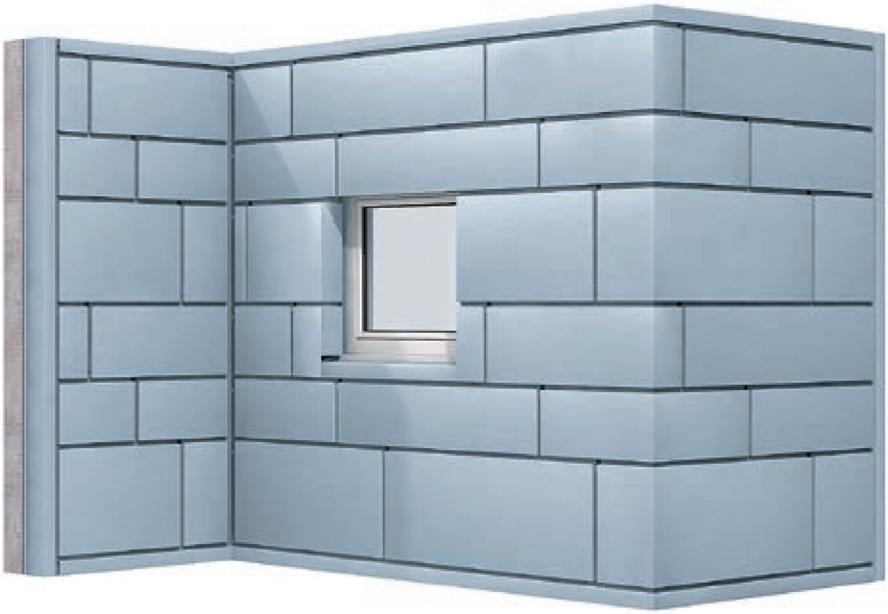


Combination facade using two different widths

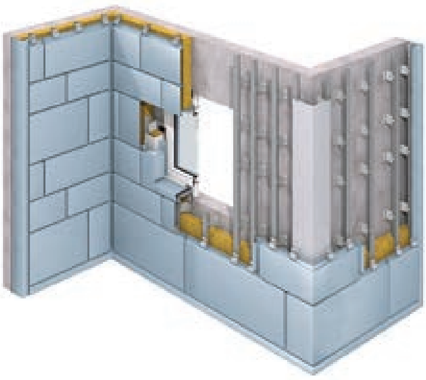
"Random structure"

2.9 Design Variations

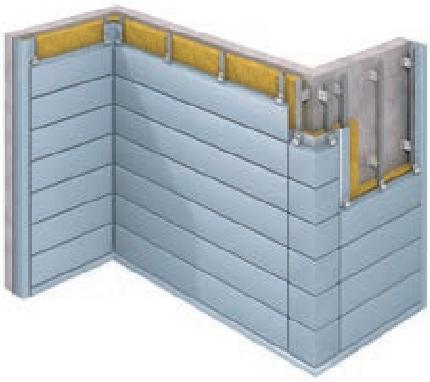
The following instructions serve to assist in proper planning of facade segmentation:
The facade images illustrated here represent a very small spectrum of design possibilities.
A combination of RHEINZINK surfaces in prePATINA blue-grey and prePATINA graphite-grey material qualities segment and accentuate a facade very clearly. Above and beyond that, various materials, widths and lengths can be combined. The examples shown here illustrate ½ staggered cladding, combined widths and a random structure.



Facade comprised of various widths.
The joint pattern is determined by shadow joints.



Facade installation using a "random structure"



Standard grid with outside corner panel

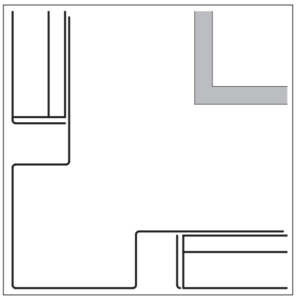
2.10 Installation and Building Tolerances

Adapter panels are used to accommodate building and installation tolerances. The position of these panels in the facade is controlled by the installation sequence: The building profiles, e.g. window and door frames, corner profiles, joint profiles, are installed first. The panels are manufactured in the RHEINZINK system center based on precise dimensions.
Dimensional adaptations can be made on site by making minor changes to the joint width. This does not affect the clamping function of the panels, one to the other. The panels are installed starting at installation point A. Usually, the adapter panels are installed before the next building profile. Depending on the tolerance to be accommodated, one or two panels are fitted in.

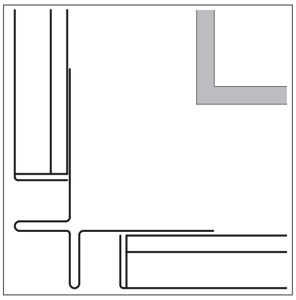
Note:
Using adapter panels ≤ 15 mm wide to accommodate tolerances is hardly noticeable.

2.11 Design, horizontal Sections

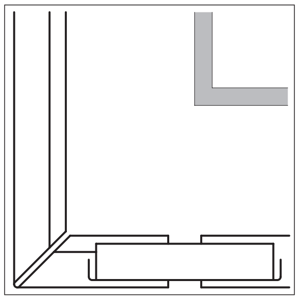
Detail H1: Outside corner



H1.1

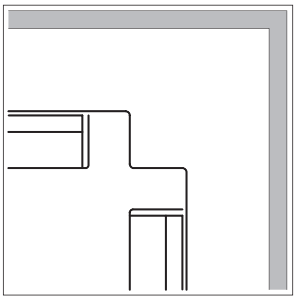


H1.2

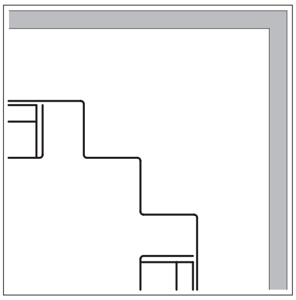


H1.3

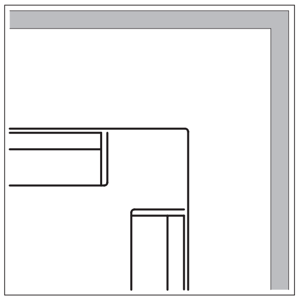
Detail H2: Inside corner



H2.1

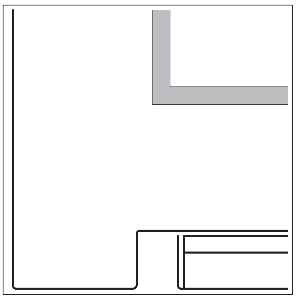


H2.2

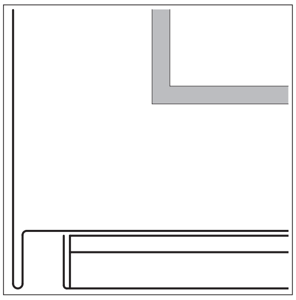


H2.3

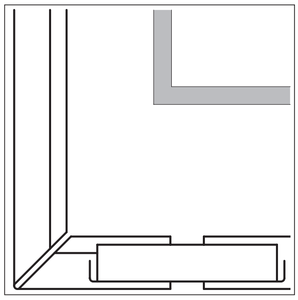
Detail H3: Window jamb



H3.1

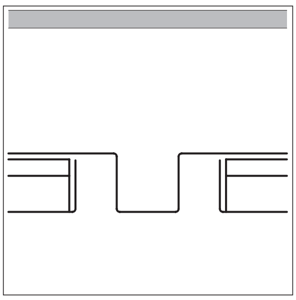


H3.2

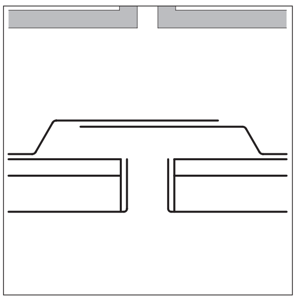


H3.3

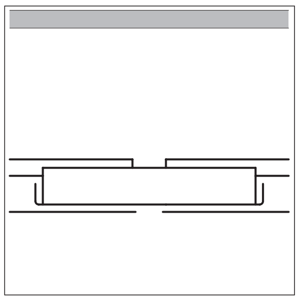
Detail H4: Expansion joint



H4.1



H4.2

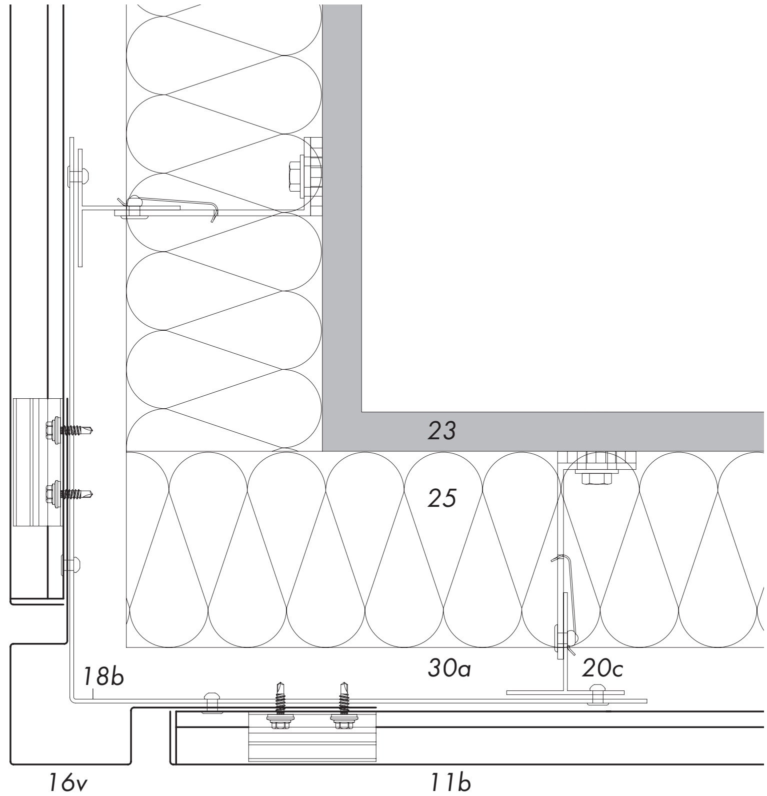


H4.3

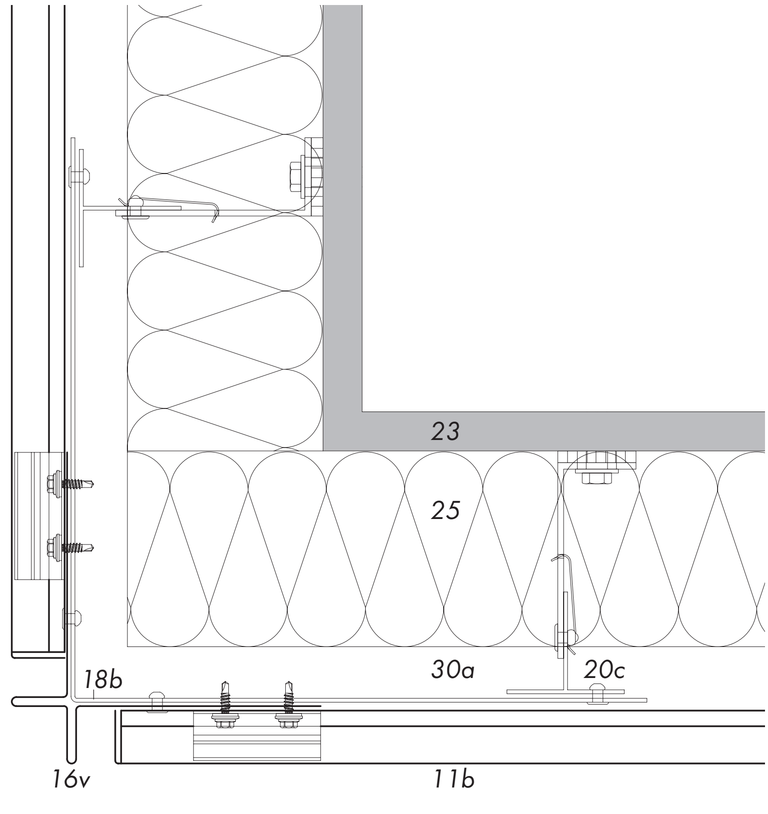
HORIZONTAL PANEL, DESIGN AND APPLICATION

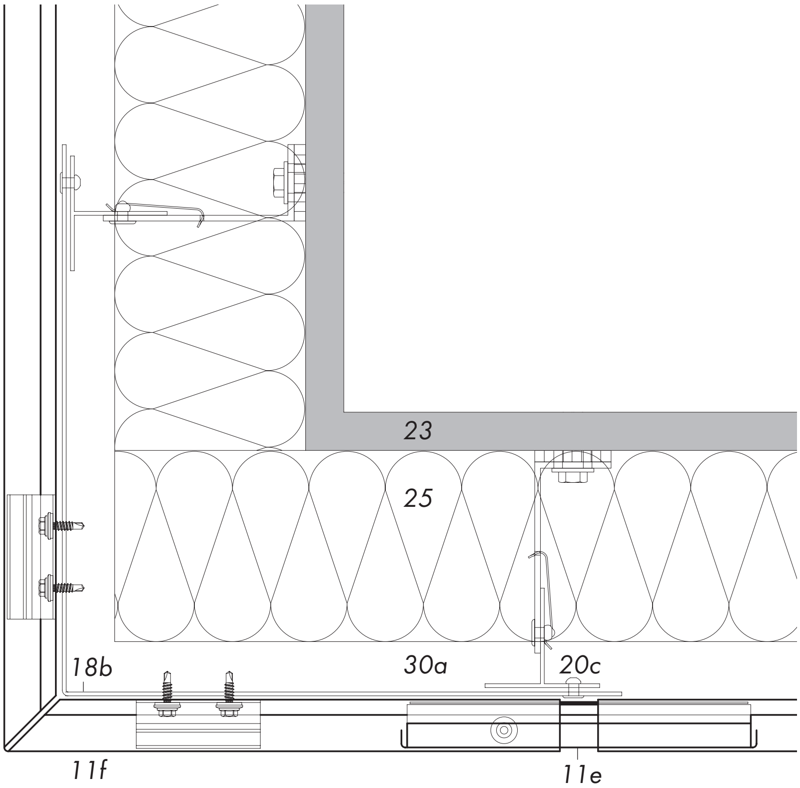
DESIGN
DETAIL H1, OUTSIDE CORNER

H1.1



H1.2





H1.3

Detail H1: Outside Corner

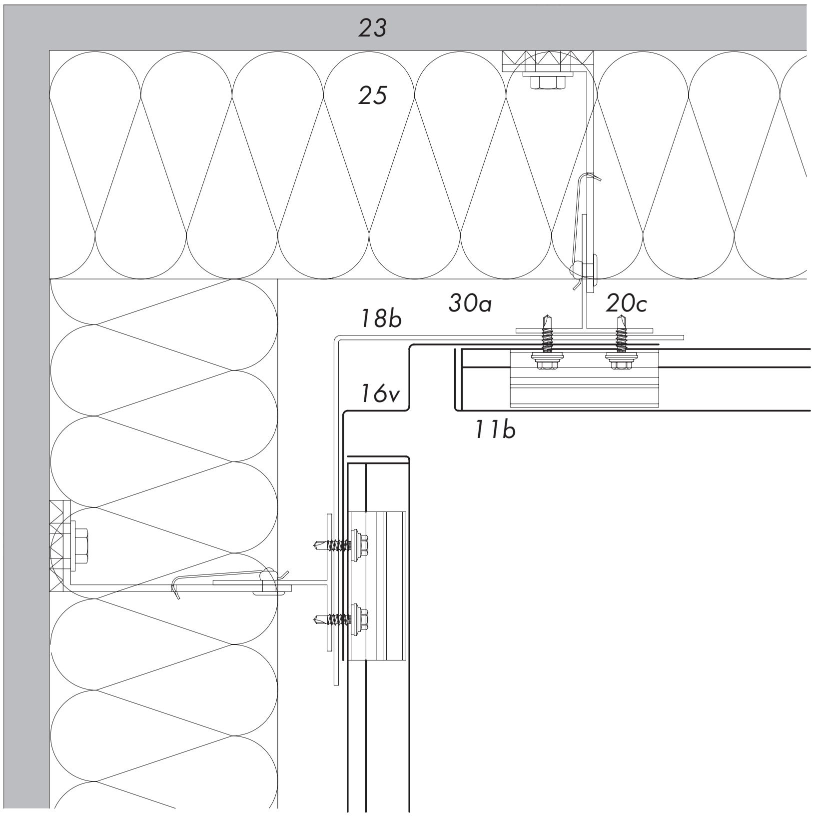
11 RHEINZINK-Horizontal Panel H 25
 b Standard panel, with stopend
 e Slave profile, with stopends
 f Corner panel
16 RHEINZINK-Building Profile
 v Corner profile
18 Support Profile
 b Aluminium
20 Substructure
 c Bracket system, with thermal break*
23 Supporting Structure
25 Thermal Insulation
30 Ventilated Air Space
 a Depth of air space ≥ 20 mm

* Manufacturer´s guidelines must be observed.

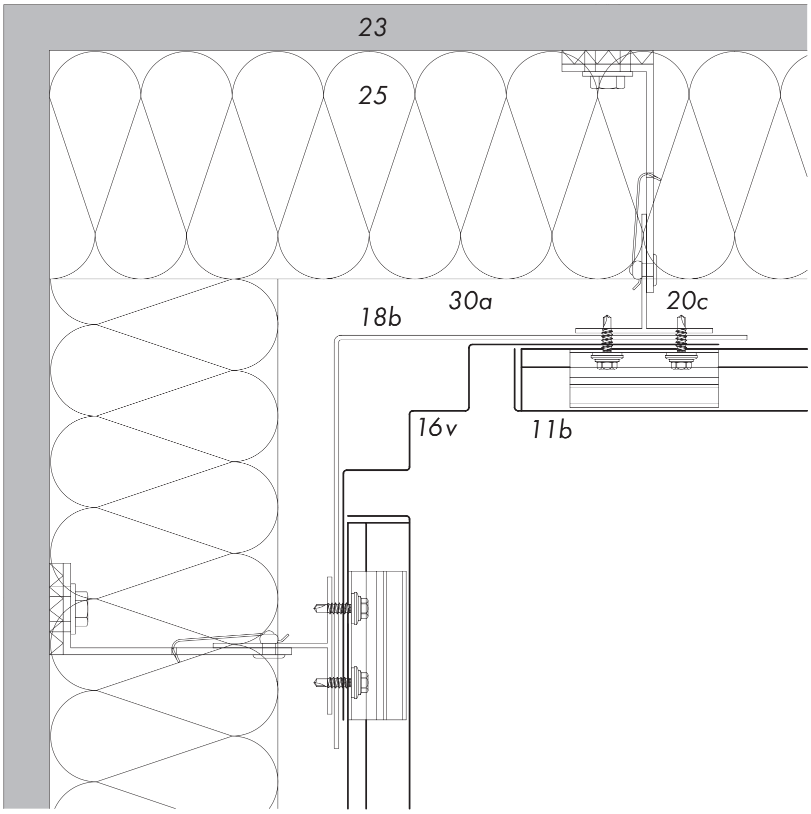
HORIZONTAL PANEL, DESIGN AND APPLICATION

DESIGN
DETAIL H2, INSIDE CORNER

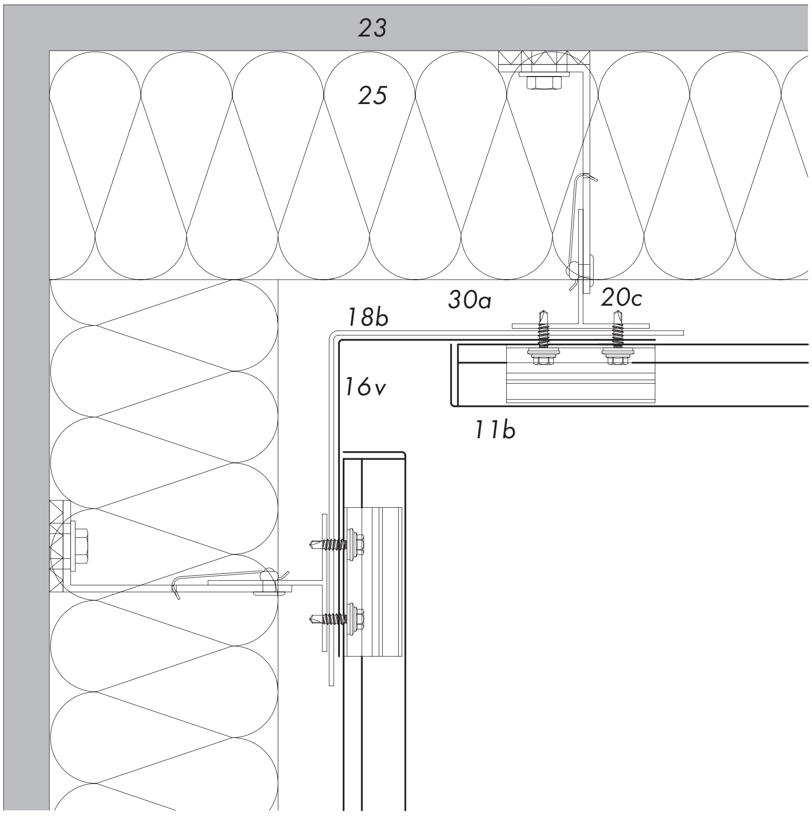
H2.1



H2.2



H2.3



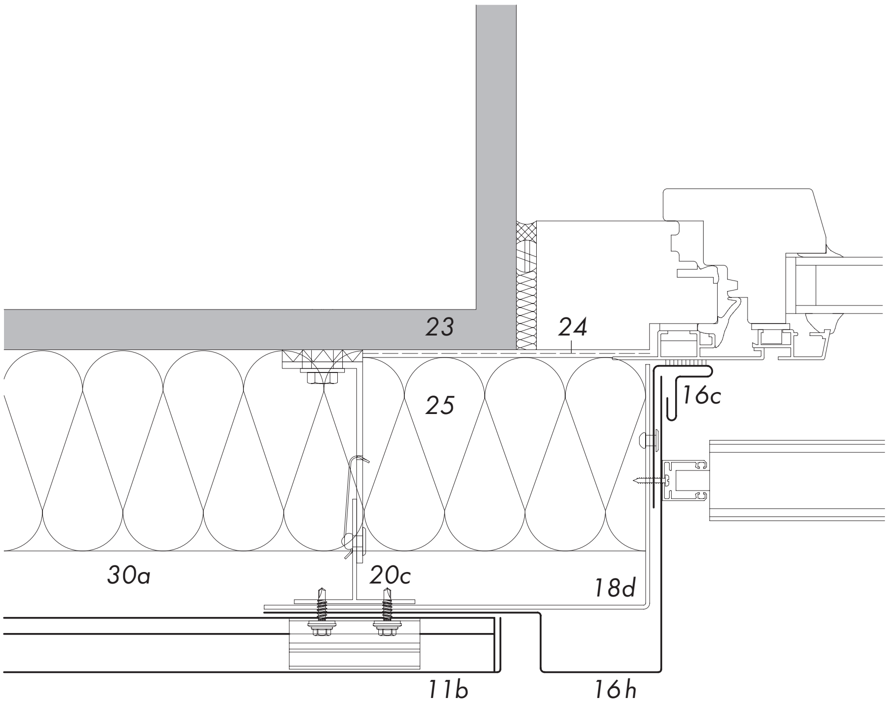
Detail H2: Inside Corner

11 RHEINZINK-Horizontal Panel H 25
   b Standard panel, with stopend
16 RHEINZINK-Building Profile
   v Corner profile
18 Support Profile
   b Aluminium
20 20 Substructure
   c Bracket system,
   with thermal break*
23 Supporting Structure
25 Thermal Insulation
30 Ventilated Air Space
   a Depth of air space ≥ 20 mm

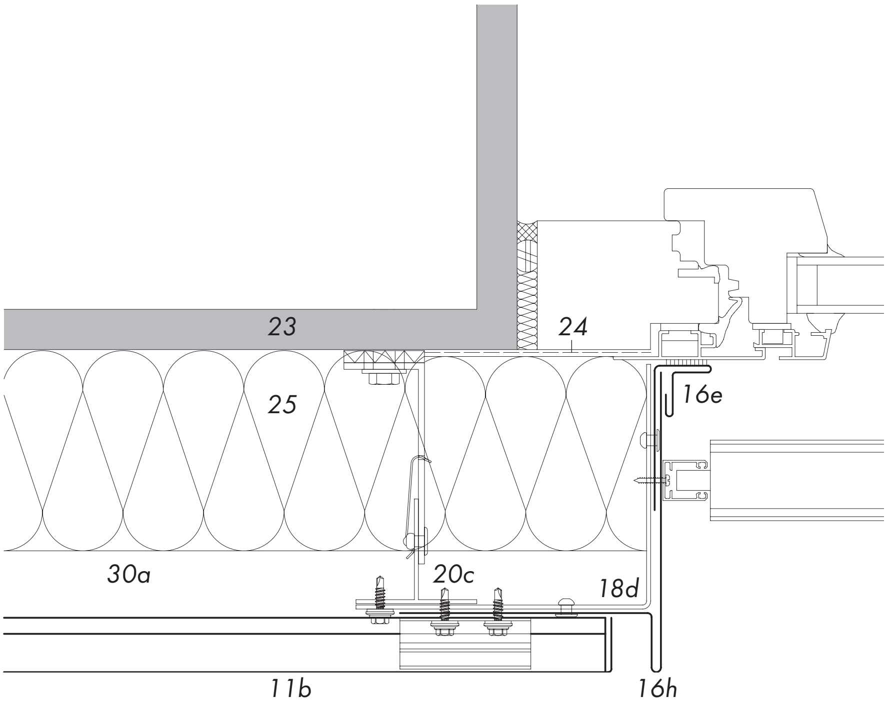
* Manufacturer´s guidelines must be observed.

DESIGN
DETAIL H3, WINDOW JAMB

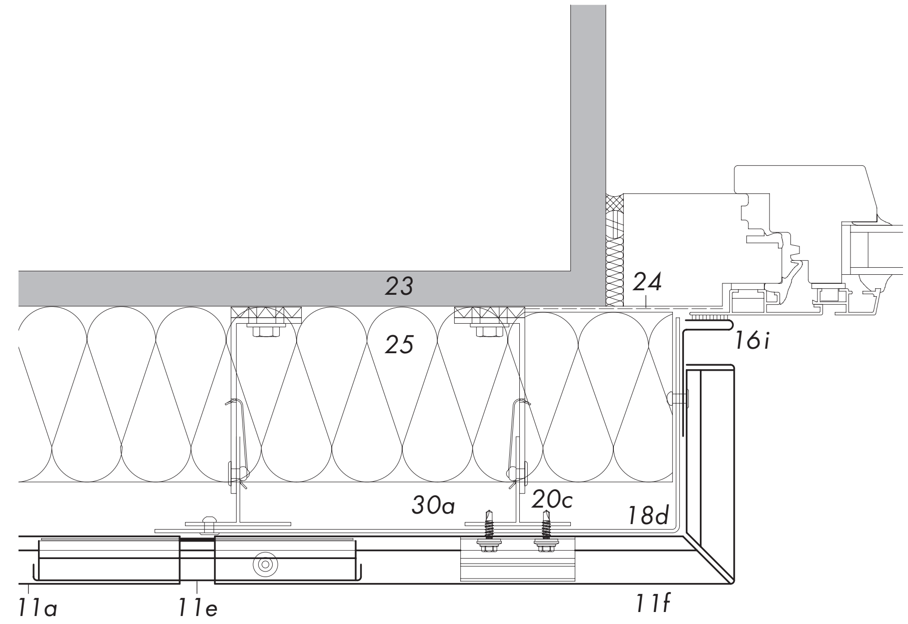
H3.1



H3.2



H3.3



Detail H3: Window Jamb

11 RHEINZINK-Horizontal Panel H 25
- a Standard panel
- b Standard panel, with stopend
- e Slave profile, with stopends
- f Corner panel

16 RHEINZINK - Building Profile
- e Receiver strip, with sealant tape
- h Jamb profile
- i Connection/ termination profile

18 Support Profile
- d Aluminium*

20 Substructure
- c Bracket system, with thermal break**

23 Supporting Structure

24 Window Foil

25 Thermal Insulation

30 Ventilated Air Space
- a Depth of air space ≥ 20 mm

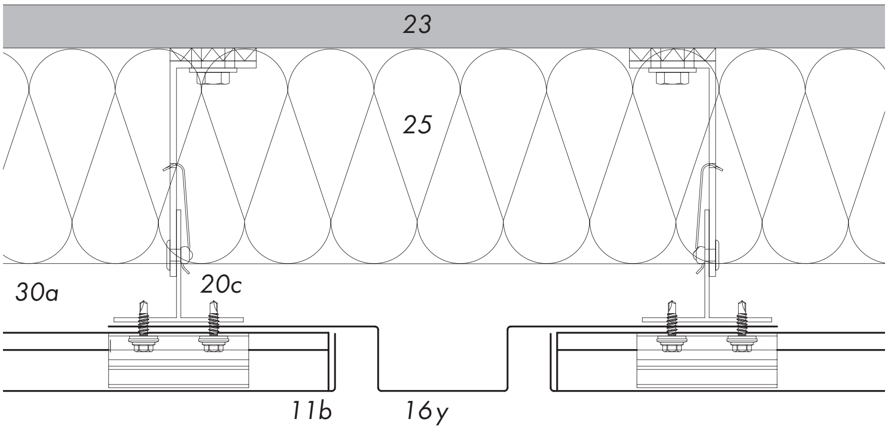
* If fire breaks are required use galvanised steel ≥ 1 mm

** Manufacturer´s guidelines must be observed.

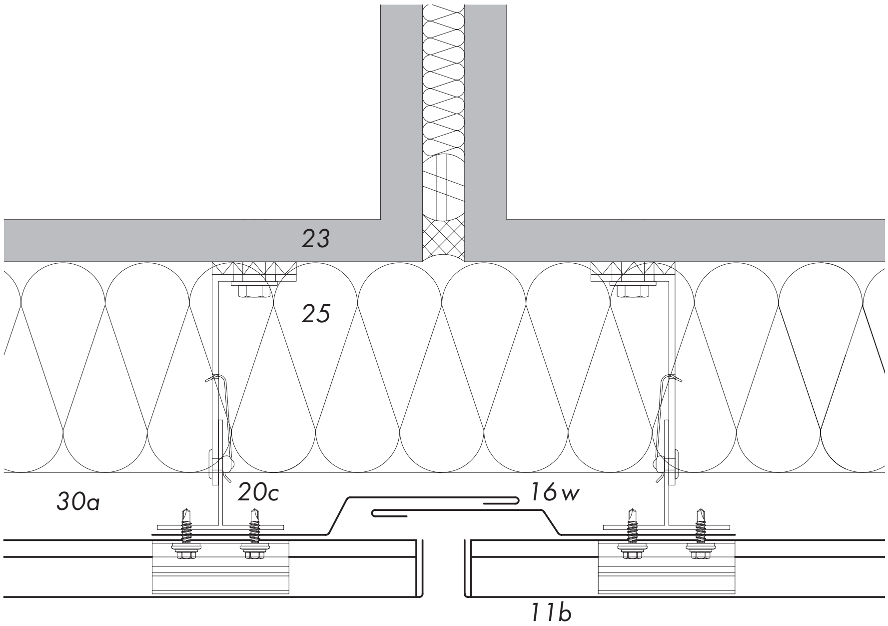
HORIZONTAL PANEL, DESIGN AND APPLICATION

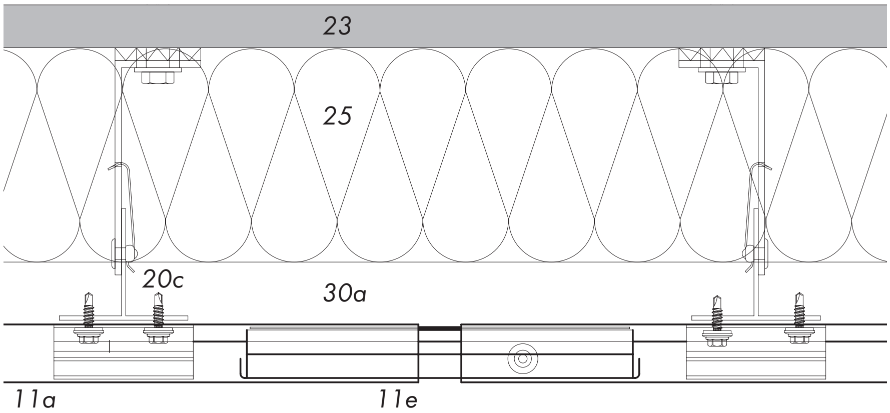
DESIGN
DETAIL H4, EXPANSION JOINT

H4.1



H4.2





H4.3

Detail H4: Expansion Joint

11 RHEINZINK-Horizontal Panel H 25
- a Standard panel
- b Standard panel, with stopend
- e Slave profile, with stopends

16 RHEINZINK - Building Profile
- w Shadow gap profile
- y Vertical joint profile

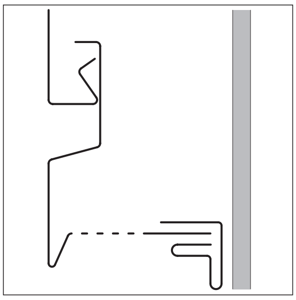
20 Substructure
- c Bracket system, with thermal break*

23 Supporting Structure
25 Thermal Insulation
30 Ventilated Air Space
- a Depth of air space ≥ 20 mm

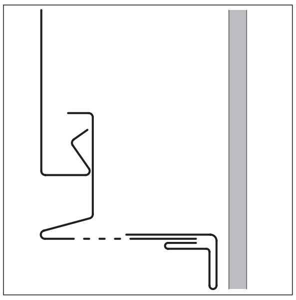
* Manufacturer´s guidelines must be observed.

2.12 Design, vertical Sections

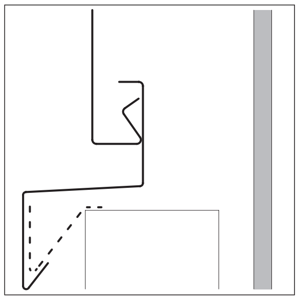
Detail V1: Base



V1.1

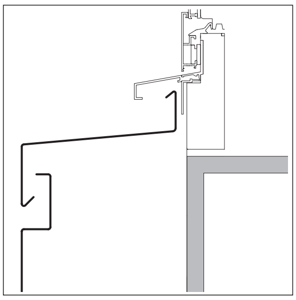


V1.2

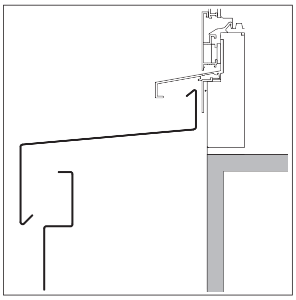


V1.3

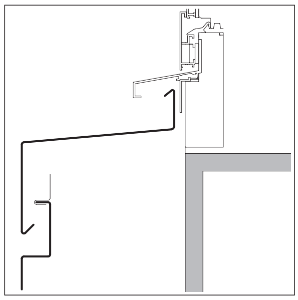
Detail V2: Window sill



V2.1

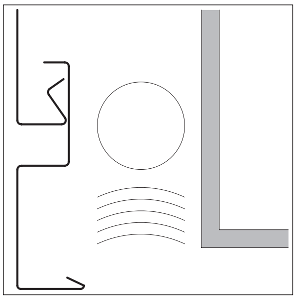


V2.2

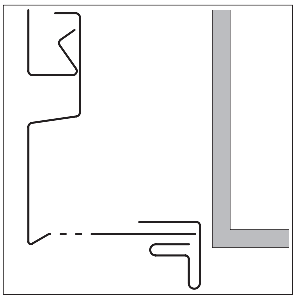


V2.3

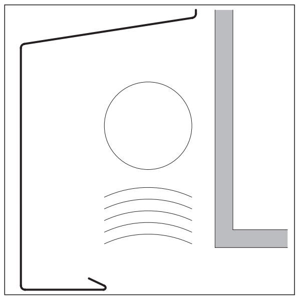
Detail V3: Window lintel



V3.1

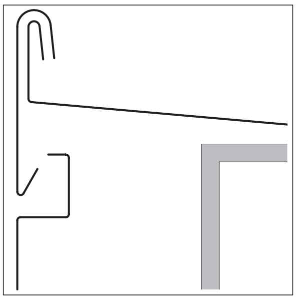


V3.2

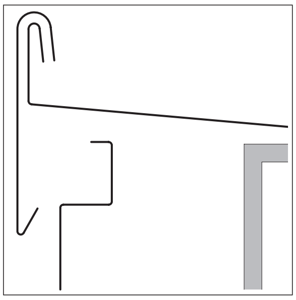


V3.3

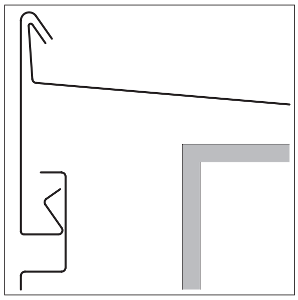
Detail V4: Two-part roof edge



V4.1



V4.2

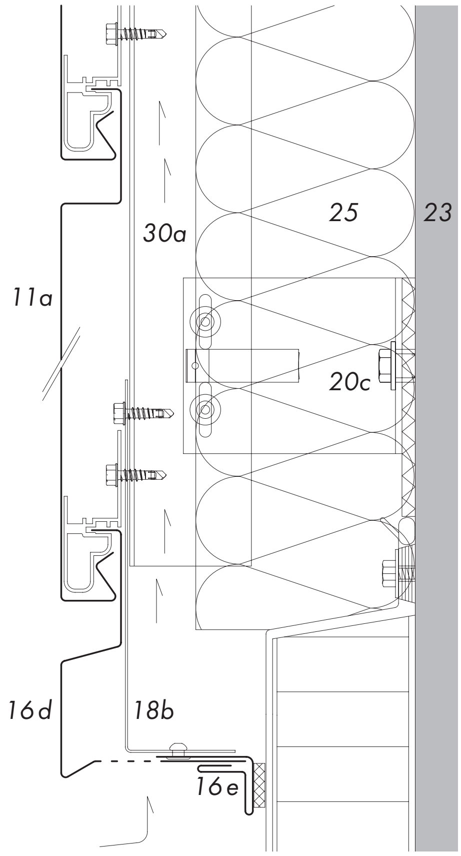


V4.3

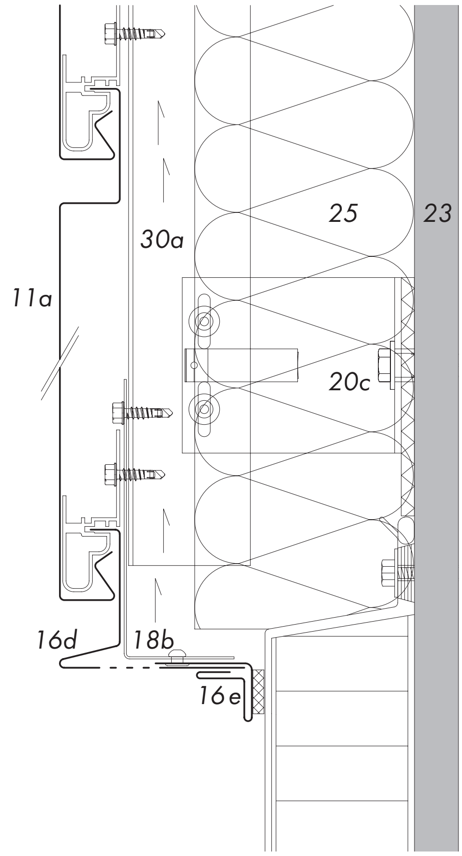
HORIZONTAL PANEL, DESIGN AND APPLICATION

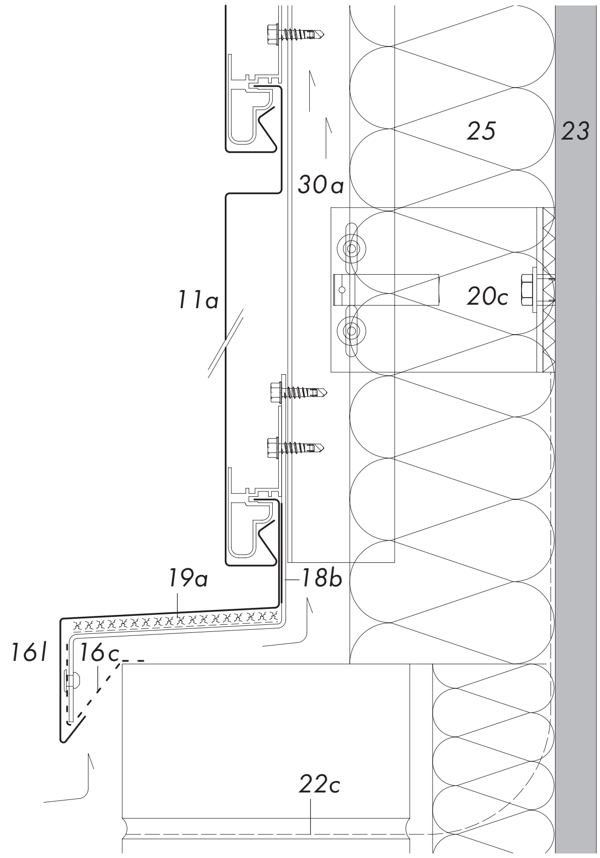
DESIGN
DETAIL V1, BASE

V1.1



V1.2





V1.3

Detail V1: Base

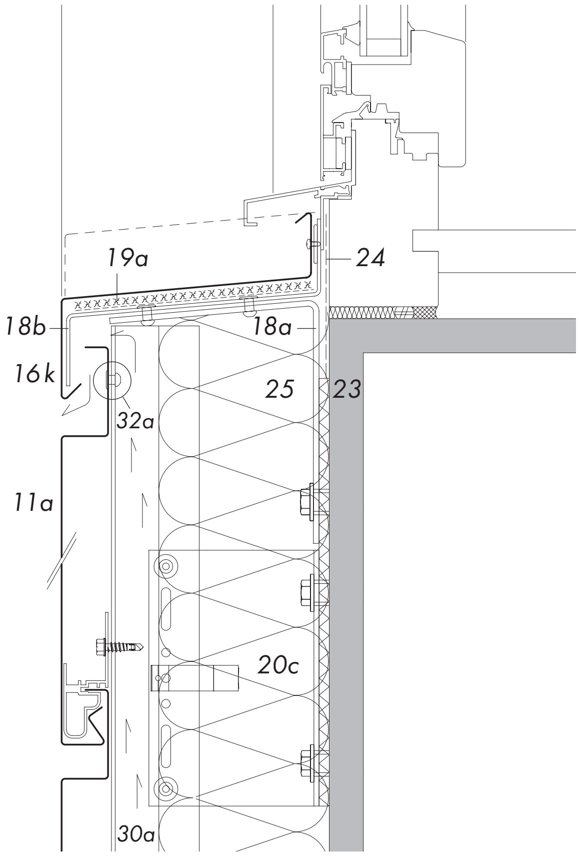
11 RHEINZINK-Horizontalpaneel H 25
   a Standardpaneel
16 RHEINZINK - Building Profile
   c Perforated strip
   d Base profile, partly perforated
   l Cornice coping
18 Support Profile
   b Aluminium
   ■ Detail V1.1 / V1.2: Intermittent support profile
19 Separating Layer
   a Structured underlay VAPOZINC
   ■ Alternative: glued to support profile over entire surface
20 Substructure
   c Bracket system, with thermal break*
22 Functional Layer
   c Waterproof sheeting
23 Supporting Structure
25 Thermal Insulation
30 Ventilated Air Space
   a Depth of air space ≥ 20 mm

* Manufacturer´s guidelines must be observed.

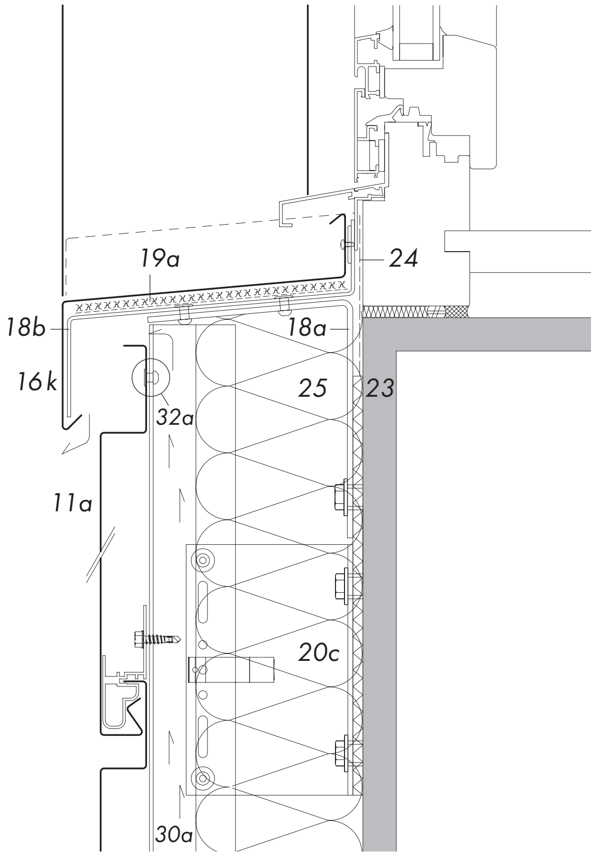
HORIZONTAL PANEL, DESIGN AND APPLICATION

DESIGN
DETAIL V2, WINDOW SILL

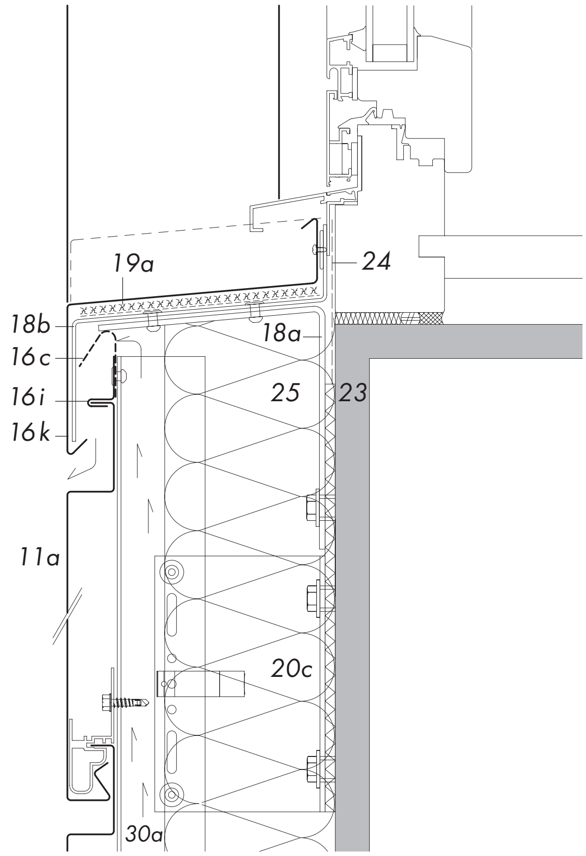
V2.1



V2.2



V2.3



Detail V2: Window sill

11 RHEINZINK-Horizontal Panel H 25
- a Standard panel

16 RHEINZINK - Building Profile
- c Perforated strip
- i Connection/ termination profile
- k Window sill coping, ≥ 3° slope

18 Support Profile
- a Galvanised steel, support angle with thermal break
- b Aluminium

19 Separating Layer
- a Structured underlay VAPOZINC
- ■ Alternative: glued to support profile over entire surface

20 Substructure
- c Bracket system, with thermal break*

23 Supporting Structure

24 Window Foil

25 Thermal Insulation

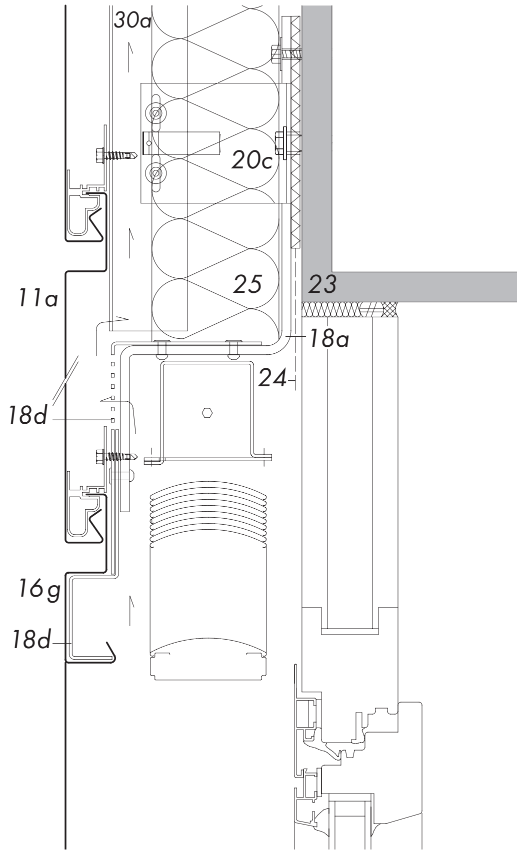
30 Ventilated Air Space
- a Depth of air space ≥ 20 mm

32 Fixing
- a Rivets, use of rivet gauge and slotted holes

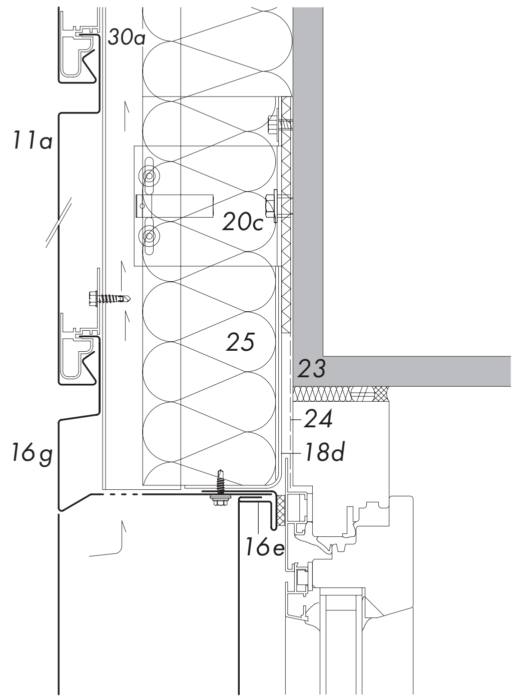
* Manufacturer´s guidelines must be observed.

DESIGN
DETAIL V3, WINDOW LINTEL

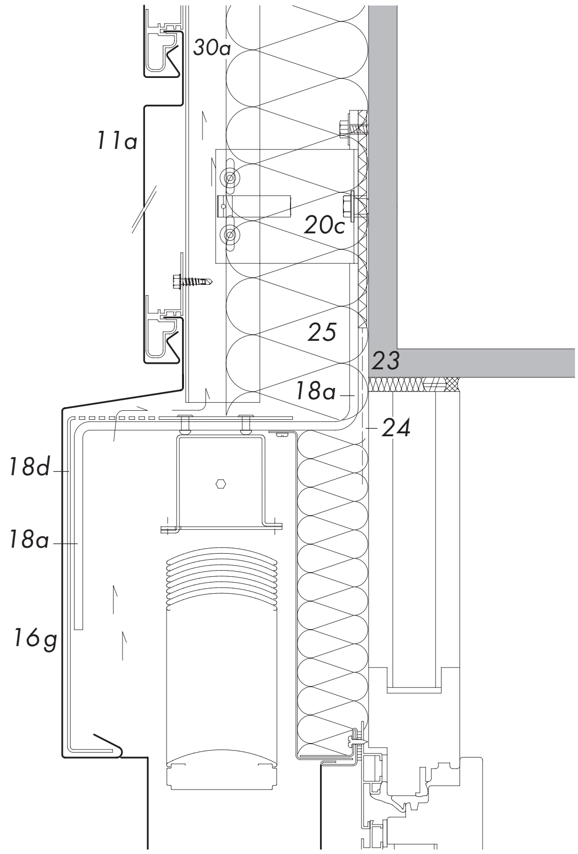
V3.1



V3.2



V3.3



Detail V3: Window Lintel

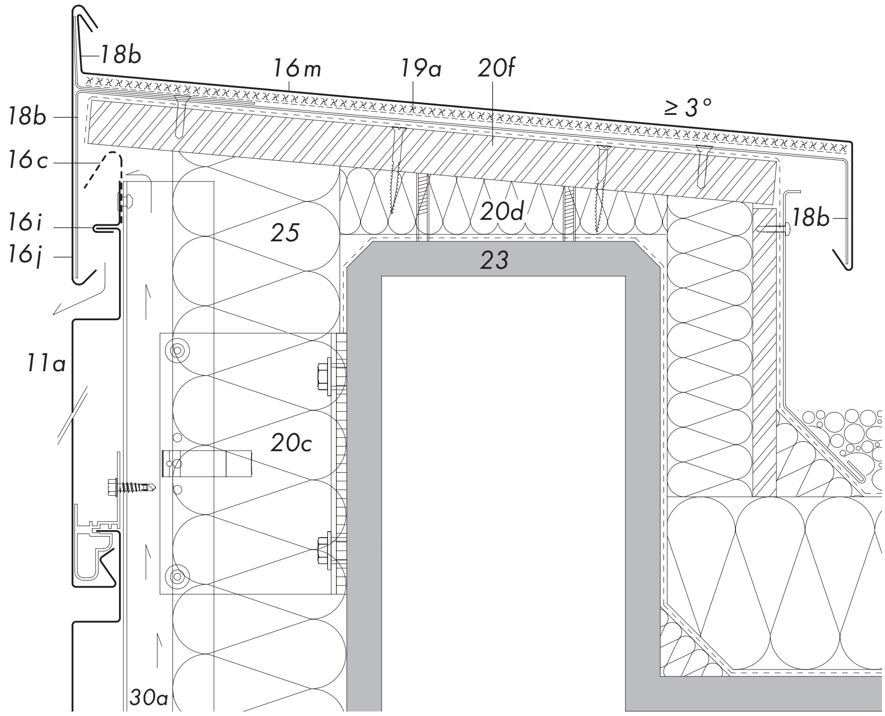
11 RHEINZINK-Horizontal Panel H 25
  a Standard panel
16 RHEINZINK - Building Profile
  e Receiver strip, with sealant tape
  g Lintel profile, with and without partly perforation
18 Support Profile
  a Galvanised steel, support profile with thermal break
  d Aluminium, with and without partly perforation*
20 Substructure
  c Bracket system, with thermal break**
23 Supporting Structure
24 Window Foil
25 Thermal Insulation
30 Ventilated Air Space
  a Depth of air space ≥ 20 mm

* If fire breaks are required use galvanised steel ≥ 1 mm

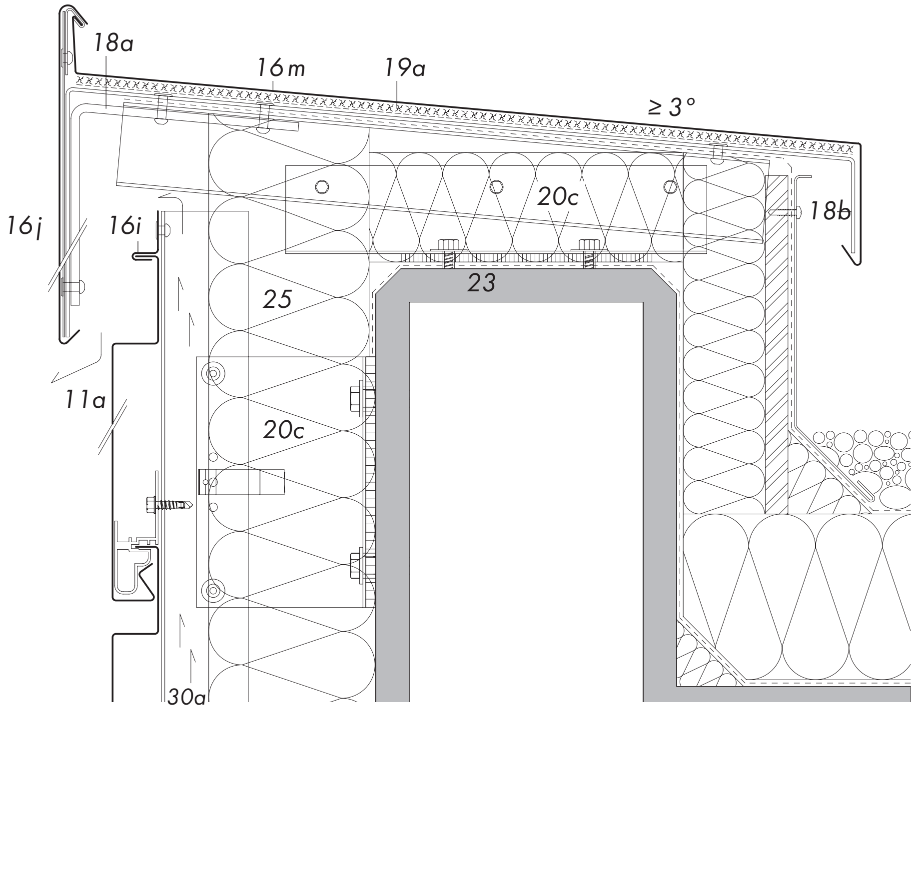
** Manufacturer´s guidelines must be observed.

DESIGN
DETAIL V4, TWO-PIECE ROOF EDGE

V4.1

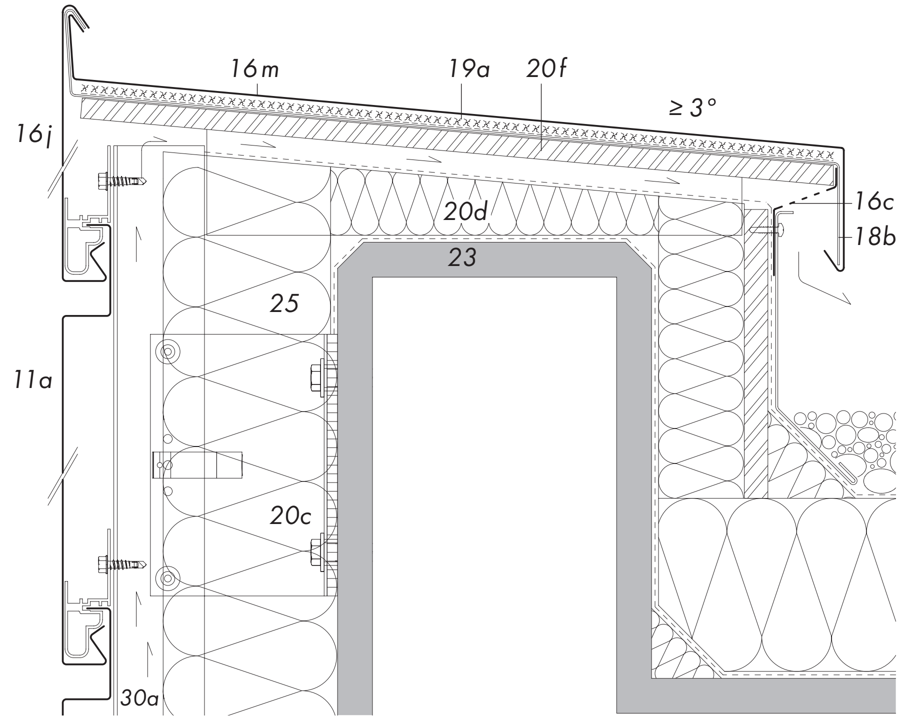


V4.2



DESIGN
DETAIL V4, TWO-PIECE ROOF EDGE

V4.3



Detail V4: Roof Edge

11 RHEINZINK-Horizontal Panel H 25
  a Standard panel
16 RHEINZINK - Building Profile
  c Perforated strip
  i Connection/ termination profile
  j Fascia profile
  m Wall coping
18 Support Profile
  a Galvanised steel
  b Aluminium
19 Separating Layer
  a Structured underlay VAPOZINC
  ■ Alternative: glued to support profile over entire surface
20 Substructure
  c Bracket system, with thermal break*
  d Wood, wedge board
23 Supporting Structure
25 Thermal Insulation
30 Ventilated Air Space
  a Depth of air space ≥ 20 mm

* Manufacturer´s guidelines must be observed.

REFERENCE PROJECTS

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3

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REFERENCE PROJECTS


6


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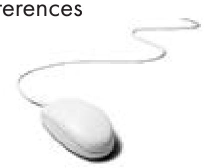
Additional project references can be found on the Internet at www.rheinzink.com



Title/6. Summer House, Schänis, Switzerland
Architect: Priska und Jost Trümpi-Landolt, Schänis, Switzerland
RHEINZINK-work done by:
Casa-technica.ch, Landolt Gebäudetechnik AG, Näfels, Switzerland

1. -4. Caprivi-Lounge, Osnabrück, Germany
Architect: Ahrens + Pörtner Architektengesellschaft mbh, Hilter am Teutoburger Wald, Germany
RHEINZINK-work done by:
Dälken - Böckenholt, Zimmerei-Dachdeckerei-Klempnerei, Glandorf, Germany

5. FERI, Maribor, Slovenia
Architect: Styria d.o.o., arhitekturni atelje, Maribor, Slovenia
RHEINZINK-work done by:
KLEMAKS d.o.o., Maribor, Slovenia
PROFORMA TREND d.o.o., Zgornja Ložnica, Slovenia

7. Private Residence, Kaarst, Germany
Architect: petershaus Gmbh & Co. KG, Kaarst, Germany
RHEINZINK-work done by:
petersdach GmbH, Kevelaer, Germany

8./9. ELller-Montan-House, Duisburg, Germany
Architect: Hüttenes GmbH Architekten, Mülheim, Germany
RHEINZINK-work done by:
Weirich GmbH, Essen, Germany

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