# Technical Appraisal 2.2/16-1752_V1

**Cancels and supersedes Technical Appraisal 2/16-1752**

*Bardage rapporté en fibre-bois*

*Built-up cladding with wood-fibre*

# Naturetech™

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**Specialized Group no. 2.2**

Built-up cladding, siding and insulated weatherboarding products and processes

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**On 31 March 2020, the Specialized Group no. 2.2 "Built-up cladding, siding and insulated weatherboarding" of the Commission Responsible for issuing Technical Appraisals examined the Naturetech™ built-up cladding process, presented by the company KWP. It has issued the Appraisal below, which cancels and supersedes Technical Appraisal 2/16-1752. This Appraisal has been issued for uses in metropolitan France.**

# 1. Brief definition

## 1.1 Brief description

Built-up cladding made of particle board laps lightly impregnated with thermosetting resins and presenting, on the exposed face, a decorative finish coating of acrylic paint.

Offered in five different profiles, the laps can be installed horizontally, vertically (Provincial laps only) or diagonally onto flat walls.

The boards are deployed by means of interlocking along their longitudinal edges and are fixed by means of nailing onto timber uprights.

### General characteristics

The standard range of Naturetech™ lap sidings is made up of the following products:

| Profile | Length (m) | Width (mm) | | Thickness (mm) |
|---|---|---|---|---|
| | | Working | Overall | |
| Prestige | 3.658 | 279 | 303 | 12.1 |
| Heritage | 3.658 | 152 | 176 | 12.1 |
| Distinction | 3.658 | 152 | 176 | 12.1 |
| Provincial | 3.658 | 279 | 294 | 12.1 |
| Laurentian | 3.658 | 216 | 241 | 12.1 |

- Dimensional tolerances of the standard manufacturing elements:
  - Width: ± 0.8 mm,
  - Length: ± 2 mm [*Sic.*],
  - Thickness: ± 0.95 mm,
  - Squareness: 1.3 mm/m,
- Density: 750 kg/m$^{3.}$
- Nominal area densities:
  - Prestige and Provincial: 9.5 kg/m²,
  - Heritage and Distinction: 9.7 kg/m²,
  - Laurentian: 9.8 Kg/m²,
- Appearance: wood relief.
- Colours of standard elements (see § 3.1).

## 1.2 Identification

Naturetech™ lap sidings with a QB certificate are identifiable by marking in accordance with the "Special requirements for QB Certification (QB15) for built-up cladding, siding and insulated weatherboarding, and under-roof trims".

The marking is consistent with § 6 of the Technical File.

# 2. Appraisal

## 2.1 Accepted field of application

- Deployment on flat and vertical walls, new or pre-existing, made from rendered masonry elements (compliant with NF DTU (construction code of practice document) 20.1) or concrete (conforming to DTU 23.1), located on first-floor or ground floor level,
- Exposure to wind corresponding to a permissable positive or negative pressure in normal wind (according to the amended NV65 rules) having the maximum value (expressed in pascals) given in Table 1 at the end of the Technical File.
- Installation possible on Timber Framed Buildings (TFB) conforming to NF DTU 31.2 of 2019, limited to:
  - maximum height of 10 m (+ gable spire) in wind zones 1,2 and 3, in situation a, b, c,
  - height 6 m maximum (+ gable spire) in wind zone 4 and/or in situation d,

  meeting the specifications given in § 10 of the Technical File.

  Situations a, b, c and d are defined in NF DTU 20.1 P3.
- The Naturetech™ built-up cladding process can be implemented within the seismic zones and on the buildings defined in § 2 of the Technical File.

## 2.2 Assessment of the process

### 2.21 Compliance with the laws and regulations in force and other fitness-for-purpose qualities

#### Stability

Built-up cladding plays no part in the functions of load transmission, bracing and impact resistance for safety. These are performed by the structure supporting it.

The stability of the built-up cladding on this structure is appropriately assured within the proposed field of application.

#### Fire safety

Compliance with the Fire Regulations in force must be verified on a case-by-case basis according to the particular building in question.

The verifications carried out (in particular with regard to the so-called "C + D" rule, including for buildings in use) must take the following characteristics into account:

- Reaction to fire classification E in accordance with the arrangements described in § B of the Technical File.
- Fire load of the laps: 199 MJ/m².

#### Accident prevention during deployment

This can be guaranteed under normal circumstances.

#### Installation within seismic zones

The Naturetech™ built-up siding process can be deployed within the seismic zones and on the buildings defined in § 2 of the Technical File.

#### Thermal insulation

Compliance with the Thermal Regulations in force must be verified on a case-by-case basis according to the particular building in question.

#### Thermal calculation elements

The surface coefficient of heat transfer $U_p$ of a wall incorporating an exterior insulation system comprising ventilated cladding is calculated according to the following formula:

$$U_p = U_c + \sum_i \frac{\psi_i}{E_i} + n \cdot \chi_j$$

Where:

- $U_c$ is the surface coefficient of heat transfer in the intermediate sections, in W/(m$^2$.K).
- $\psi_i$ is the linear coefficient of heat transfer of the integral thermal bridge i, in W/(m.K), (framework).
- $E_i$ is the centre distance of the linear thermal bridge i, in m.
- n is the number of intermittent thermal bridges per m² of wall.
- $\chi_j$ is the periodic coefficient of heat transfer of the integral thermal bridge j, in W/K (angle brackets).

The coefficients $\psi$ and $\chi$ must be determined by digital simulation as per the method given in the Th-Bât rules, Thermal Bridges section. In the absence of digitally calculated values, the default values given in § 2.4 of the Opaque Walls section of the document "RT: valeurs et coefficients pour l'application des règles Th-Bât" (RT: values and coefficients for the application of the Th-Bât rules) can be used.

At particular features, account should also be taken of losses through the trim profiles.

#### Tightness

To air: this function is performed by the support wall,

To water: this function is performed satisfactorily by the overlap joints of the cladding panels and by the trim profiles at particular features.

- On concrete or masonry substrates: the system allows for realization of type XIII walls as defined in the document "Conditions Générales d'emploi des systèmes d'isolation thermique par l'extérieur faisant l'objet d'un Avis Technique" (General conditions for the deployment of exterior thermal insulation systems forming the subject of a Technical Appraisal" (*Cahier du CSTB* 1833, March 1983), the substrate walls being required to meet the specifications of chapters 2 and 4 of said document, and must be airtight.

- On TFB substrates: tightness is assured satisfactorily within the accepted field of application.

**Environmental data**

The Naturetech™ process does not have an Environmental Statement (ES) and cannot therefore claim any particular environmental performance. It is recalled that Environmental Statements do not fall within the scope of the fitness-for-purpose examination of the process.

**Health aspects**

This appraisal is issued in light of the appraisal holder's written undertaking to comply with the regulations, and in particular with all regulatory obligations relating to products liable to contain hazardous substances, in respect of their manufacture, their incorporation into structures within the accepted field of application and the exploitation thereof. Verification of the information and declarations delivered in application of the regulations in force do not fall within the scope of this appraisal. The holder of this appraisal retains full liability for said information and statements

**Impact resistance performance**

The performances of the Naturetech™ process in terms of resistance to exterior impacts correspond, in accordance with the standard P08-302 and the *Cahiers du CSTB* 3546-V2 and 3534, to exposure class Q4 on an easily replaceable wall.

### 2.22 Durability - Maintenance

The specific durability of the constituent parts of the system and their compatibility permits the conclusion that this built-up cladding will present satisfactory durability equivalent to that of traditional claddings, owing to the fact that it consists of a specific particle board with high performances, exhibiting excellent in situ behaviour, as found in numerous real-life situations where type tests have been performed on the boards without the finish coat.

The durability of the structural substrate is improved by the presence of this built-up cladding, in particular with associated thermal insulation.

### 2.23 Manufacture and control

This appraisal is issued taking into account the manufacturing controls and means of verification described in the Technical Document prepared by the Applicant (DTED in French).

The manufacture of Naturetech™ lap sidings is subject to systematic self-checking which is regularly monitored by the CSTB, thus assuring appropriate consistency of quality.

The manufacturer making use of this Technical Appraisal must be able to produce a QB certificate issued by the CSTB certifying that the product conforms to the characteristics described in the certification standard after evaluation in accordance with the control procedures defined in that standard.

Products in receipt of a valid certificate are identifiable by the presence of the QB, logo followed by the number identifying the factory and a product identification number.

### 2.24 Supply

The elements supplied by the company KWP essentially consist of the Naturetech™ siding laps and specific basic accessories. Other elements (stud battens, fixing brackets, insulation, anchors etc.) are directly procured by the installer, in accordance with the description given in the Technical File.

### 2.25 Deployment

This built-up cladding is installed without particular difficulty with prior identification of the substrate, a layout plan of the additional elements and profiles and observance of the installation conditions.

At the request of the installation company, the company KWP provides technical assistance.

## 2.3 Technical specifications

### 2.31 Design conditions

**Fixings**

Fixings to the bearing structure must be chosen with consideration of the wind exposure conditions and their calculated pull-out strength value for the substrate in question.

In the case of substrates made of normal aggregate concrete or masonry, the ultimate limit state strength of the anchors will be calculated according to the ETA (European Organisation for Technical Assessment), ETAGs (European Technical Approval Guidelines) 001, 002, 202 or 029 (or the corresponding European Assessment Document).

In the case of substrates whose characteristics are unknown, the ultimate limit state strength of the anchors will be verified by a prior exploration, in accordance with the document "Détermination sur chantier de la résistance à l'état limite ultime d'une fixation mécanique de bardage rapporté" (On-site determination of the ultimate limit state strength of a built-up cladding mechanical anchor) (*Cahier du CSTB* 1661-V2).

### Timber framework

The design and deployment of the timber framework will be compliant with the specifications of the document "Règles générales de conception et de mise en œuvre de l'ossature bois et de l'isolation thermique des bardages rapportés faisant l'objet d'un Avis Technique" (General rules for the design and deployment of the timber framework and thermal insulation for built-up claddings forming the subject of a Technical Appraisal (*Cahier du CSTB* 3316-V2), with the addition of the following specifications:

- The coplanarity of the studs must be verified between adjacent studs, with a maximum tolerance of 2 mm.
- Timber studs with a mechanical strength corresponding to at least strength class C18, according to standard NF EN 338, having a Class 2 natural or conferred durability of use with a protective strip or 3b, according to FD P 20-51.
- At installation, the timber studs and laths must have a maximum target moisture content of 18%, with a variation between two elements of no more than 4%. The moisture content of the elements must be determined in accordance with the method described in the standard NF EN 13183-2 (using a probe moisture meter).
- The permissible vertical load resistance of the angle bracket to be taken into account must be that corresponding to a load-deformation characteristic of 3 mm.
- The maximum centre distance between the lap support studs or furring strips is 400 mm. In the case of a 600 mm centre distance (or 645 mm on a TFB) or a horizontal installation of Naturetech™, installation is carried out on a double framework structure.

## 2.32 Deployment conditions

A prior layout plan must be prepared.

Using Naturetech™ lap sidings to create rigid bridging of the joints between successive non-jointed uprights is not permissable.

### Direct installation on the substrate

Since the studs are fixed directly to the substrate, planarity defects in said substrate (misalignment, lips, protrusions and various irregularities) must not exceed 5 mm under a 20 cm rule and 10 mm under a 2 m rule.

This planarity must be taken into account in the Special Contract Documents.

### Installation on Timber Frame Buildings (TFB)

The requirements given in NF DTU 31.2 de 2019, in § 10 of the Technical File and in Figures 17 to 22 must be met.

The water-resistant barrier will be ocerlapped every 6 m to allow for the discharge of runoff water to the exterior.

The framework will be separated at every floor level.

The bridging of the joints between successive non-jointed studs is not acceptable.

The framework furring strips will be installed at right-angles to the TFB uprights, in accordance with § 10 of the Technical File

*For Specialized Group no. 2.2*
*The President*

## Conclusions

### Overall assessment

The use of the Naturetech™ process within the accepted field of application (see Paragraph 2.1) is favourably assessed.

### Validity

As of the publication date given on the first page and up to 31 December 2025.

## 3. Additional comments by the Specialized Group

This second revision contains no significant modifications.

Concerning wind resistance, the permissible values in normal wind declared in connection with the effects of negative pressure take account of an assumed safety factor equal to 3.5 on the ruin value, reflected in the test by pull-out of the nails.

The hygrothermal dimensional variations are low (of the order of 1 mm/m) but they nevertheless necessitate observance of the [stipulated] clearances at the ends of the laps during installation.

The paint finish plays an aesthetic role only.

Compliance with the reaction to fire classification implies respect for technical and architectural arrangements in order to satisfy the Fire Regulations in force, which arrangements are not illustrated in the details of the Technical File.

The process has no elements allowing specification of the measures described in IT249 of 2010 in buildings to which this Technical Instruction applies.

This Technical Appraisal is subject to QB product certification of the Naturetech™ lap sidings.

*The Rapporteur of Specialized Group no. 2.2*

# Technical File
## prepared by the Applicant

# A. Description

## 1. Principle

Naturetech™ is a system of built-up cladding made of particle board laps impregnated with thermosetting resins and presenting, on the exposed face, a decorative finish coating of acrylic paint.

Offered in five different profiles, the laps can be installed horizontally, vertically or diagonally onto flat walls.

The laps are deployed by means of interlocking along their longitudinal edges and fixing by nailing onto timber uprights.

A ventilated air space is created between the internal face of the sidings and the bare exterior of the bearing wall or of any thermal insulation.

## 2. Field of application

- Deployment on flat, vertical walls, new or pre-existing, in masonry or concrete located at first-floor or ground floor level.
- Exposure to wind corresponding to a permissible positive or negative pressure in normal wind (according to the amended NV65 rules) having the maximum value (expressed in pascals) given in Table 1 at the end of the Technical File.
- Installation possible on Timber Framed Buildings (TFB) conforming to NF DTU 31.2 of 2019, limited to:
  - maximum height of 10 m (+ gable spire) in wind zones 1,2 and 3 in situation a, b, c,
  - height 6 m maximum (+ gable spire) in wind zone 4 and/or in situation d,

  observing the specifications given in § 10 of the Technical File.

  Situations a, b, c and d are defined in NF DTU 20.1 P3.
- The built-up cladding system can be deployed in seismic zones and buildings according to the table below (according to the Decree of 22 October 2010 and amendments thereto):

| Seismic zones | Classes of categories of importance/size of the buildings ??? | | | |
|---|---|---|---|---|
| | I | II | III | IV |
| 1 | X | X | X | X |
| 2 | X | X | | |
| 3 | X | | | |
| 4 | X | | | |

| | |
|---|---|
| X | Installation authorised with no particular measures according to the accepted field of application |
| | Installation authorised with no particular measures according to the accepted field of application for single-storey educational establishments (belonging to size category III) fulfilling the conditions of Paragraph 1.1[1] of the Earthquake-proof Construction Rules PS-MI 89 revised in 92 (NF P06-014), |
| | Installation authorised with no particular measures according to the accepted field of application for buildings in size category II fulfilling the conditions of Paragraph 1.1[1] of the Earthquake-proof Construction Rules PS-MI 89 revised in 92 (NF P06-014), |
| | Installation not authorised |

- For structure heights ≤ 3.5 m, installation of the built-up cladding system in seismic zones is authorised with no particular measures, irrespective of the size category of the building and seismic zone (see ENS Guide).

## 3. Elements

The Naturetech™ system is a complete system of built-up cladding consisting of:

- Naturetech™ wall laps
- Special Naturetech™ accessories,
- The various fixings,
- Additional thermal insulation and made-to-order profiles potentially required to deal with particular features.

### 3.1 Naturetech™ lap sidings

The laps are manufactured by cutting type 5 particle boards according to the standard CAN/CGSB-11.3-M87, the conformity thereof being certified by the technical data sheet CCMC 13384-L issued by the CNRC (National Research Council of Canada) and re-evaluated every two years.

The laps are made from particle board impregnated with thermosetting phenol-formaldehyde resin (14%), compressed (3,400 kPa) at high temperature (210$^0$C). The laps are coated with a water-based acrylic paint.

The composition of the boards is as follows:

- 80 % wood particles
- 14.5 % phenol-formaldehyde resin
- 5 % wax
- 0.5 % pre-primer.

The mechanical and physical properties of the particle boards are determined in accordance with the requirements of the standard CAN/CGSB 11.3-M97. The specified values are given in § 5.2:

- Density according to ASTM D 2395 method A (corresponds to EN323).
- Moisture content ASTM D 4442 method B (corresponds to EN322).
- Bending strength according to ASTM D 1037 (corresponds to EN310).
- Modulus of elasticity according to ASTM D 1037 (corresponds to EN310).
- Internal bond strength according to ASTM D 1037 (corresponds to EN319).
- Swell ASTM D 1037 (corresponds to EN317).
- Water absorption (immersion for 24 hours) ASTM D 1037 method B(corresponds to EN 317).
- Internal bond strength after boil test according to EN1087-1.

The particle boards also meet the following criteria of the standard CAN/CGSB-11.3-M87 for type 5:

- Residual bond strength after 6 cycles of treatment ≥ 50% according to ASTM D 1037.
- Permanent swell after 6 cycles of treatment ≤ 15% according to ASTM D 1037.

The standard range of Naturetech™ lap sidings comprises the following profiles:

| Profile | Length (m) | Width (mm) | | Thickness (mm) |
|---|---|---|---|---|
| | | Working | Overall | |
| Prestige | 3.658 | 279 | 303 | 12.1 |
| Heritage | 3.658 | 152 | 176 | 12.1 |
| Distinction | 3.658 | 152 | 176 | 12.1 |
| Provincial | 3.658 | 279 | 294 | 12.1 |
| Laurentian | 3.658 | 216 | 241 | 12.1 |

- Dimensional tolerances of the standard manufacturing components:
  - Width: ± 0.8 mm,
  - Length: ± 2 mm,
  - Thickness: ± 0.95 mm,
  - Squareness: 1.3 mm/m,
- Density: 750 kg/m$^{3.}$
- Nominal area densities:
  - Prestige and Provincial: 9.5 kg/m²,
  - Heritage and Distinction: 9.7 kg/m²,
  - Laurentian: 9.8 Kg/m²,

- Appearance: wood relief
- Colours of the standard elements: White, Almond, Khaki, Yellowstone, Pine, Acadia, Maize, Cedar, Sierra, Green, Granite, Midnight Blue, Rustic Red, Thunder Blue, Red Wine, Coffee.

  These shades are monitored by the CSTB on the basis of the internal production control system for manufacturing.

  Other shades and appearances, validated in-factory, may also be offered as part of the expansion of the current range, on the basis of internal manufacturing monitoring and external monitoring by the CSTB.

## 3.2 Fixings

The laps are fixed by means of ring nails. These fixings must meet the following characteristics:

- Ring nail (not smooth) as defined in the standard NF EN 14592, made of AISI 316 stainless steel
- Minimum diameter: 2.3 mm
- minimum diameter of the nail head: 5 mm (head slightly domed)
- Minimum length: 40 mm (anchorage ≥ 32 mm, ≥ 28 mm for the Laurentian)
- Characteristic pull-out strength $P_K$ of the ring nails according to *Cahier du CSTB* 3316-V2 ≥ 672 N for anchorage in the timber stud of at least 32 mm (≥ 588 N for anchorage in the timber stud of at least 28 mm for the Laurentian).

  Example of fixing: NORFIX Pinto NFX 10333.

  Other fixings of the same nature, with identical dimensions and equal or higher characteristics can be used.

The centre distance between the nails must not exceed 400 mm.

Start to nail at one end of the cladding and continue up to the other end to prevent buckling. Ensure that the planks are aligned with the corners of the building. Do not sink the nail head into the cladding.

### 3.21 Horizontal installation

In horizontal installation, the cladding must be nailed along the nailing line (approximately 12 mm from the top edge of the panels) onto each stud or vertical lath located on an upright, leaving no more than a 400 mm centre distance between the nails.

All Naturetech™ profiles can be installed horizontally.

### 3.22 Vertical installation

Vertical installation requires fixing to horizontal studs or furring strips with a centre distance not exceeding 400 mm. The furring strips or studs must be at least 25 mm thick and must be nailed onto a double framework structure.

Only the Provincial or Prestige profiles can be installed vertically.

### 3.23 Diagonal installation

**Laps inclined from the horizontal by no more than 45°**

All Naturetech™ profiles can be installed diagonally, at up to 45° from the horizontal.

In diagonal installation, fixing (concealed by the upper siding) is carried out along the upper longitudinal edge (edge distance 12 to 15 mm according to the profile), with a maximum centre distance between uprights of 300 mm.

**Above a 45° lap incline from the horizontal**

Only the Provincial or Prestige profiles can be installed at an incline of 45 [to] 90° from the horizontal.

These profiles are fixed onto a double framework structure (as for vertical installation), with a maximum centre distance between uprights of 300 mm.

## 3.3 Timber framework

The framework components conform to the *Cahier du CSTB* 3316-V2.

The studs present the following minimum dimensions on concrete or masonry substrates:

- Minimum exposed width: 60 mm
- Minimum thickness: 32 mm (30 mm for the Laurentian)
- Maximum centre distance between studs: 400 mm.

## 3.4 Insulation

ACERMI certified insulation, conforming to the *Cahier du CSTB* 3316-V2.

## 3.5 Matching accessories

A comprehensive line of mouldings and accessories is available from KWP.

### 3.51 Starter strip

For all Naturetech™ laps. Profile in 6/10 mm painted aluminium sheet. Fitted prior to installation of the cladding, it secures the lower laps.

### 3.52 Exterior corner

Profile in painted aluminium sheet. Fitted prior to installation of the laps, it creates a finish for external angles. For each profile, leave an expansion gap of 5 mm between the end of the lap and the base of the aluminium profile.

### 3.53 Interior corner

Profile in painted aluminium sheet. Fitted at the same time as the laps, it provides a finish for internal angles. For each profile, leave an expansion gap of 5 mm between the end of the lap and the base of the aluminium profile.

### 3.54 Joint moulding

Profile in painted aluminium sheet. Fitted at the same time as the sidings, it provides a means of abutting the laps whilst maintaining an expansion joint.

### 3.55 J mouldings

Profile in painted aluminium sheet. Fitted prior to installation of the cladding, it provides certain finishes for, for instance, the vertical joint at windows and doors. In each profile, leave an expansion gap of 5 mm between the end of the siding and the base of the aluminium profile.

### 3.56 Drip cap

Profile in 8/10 mm painted aluminium sheet. The drip cap is fitted prior to installation of the cladding. It is fixed directly to the framework and provides a finish above windows and doors, and acts as a water discharge structure.

### 3.57 Transition moulding

Profile in 8/10 mm painted aluminium sheet. The drip cap [*Sic.*] is installed prior to installation of the cladding. It is fixed directly to the framework.

### 3.58 F 13 or F25 moulding

Profile in painted aluminium sheet fitted prior to installation of the cladding. In each profile, leave an expansion gap of 5 mm between the end of the lap and the base of the aluminium profile.

### 3.59 Naturetech™ colour-matched acrylic sealant

From KWP, this sealant matches the various colours available and provides a means of forming a seal between vertically or diagonally installed sidings, and of finishing certain elements.

### 3.510 Retouch paint and stain

Matching the various colours available, these paints allow the repair of small damaged areas of cladding and the treatment of exposed lap cuts not protected by Naturetech™ accessories.

### 3.511 Corner mouldings in machined wood

Corner mouldings in machined wood, in matching colours. Use instead of aluminium exterior corners for an architectural accent.

# 4. Manufacture

Naturetech™ sidings are manufactured by the company KWP, 1367 Nationale, Terrebonne, Québec J6W 6H8 (Canada).
A pre-finished particle board panel is cut and then mechanically profiled, before being finished by 1 coat of primer and 2 coats of acrylic paint, [and] kiln dried.

# 5. Manufacturing controls

The manufacturing of Naturetech™ lap sidings is subject to systematic self-checking which is regularly monitored by the CSTB, thus assuring appropriate consistency of quality.

The manufacturer must be able to produce a certificate.

The in-factory self-checking of the siding manufacturing process involves the following points in particular:

## 5.1 On raw materials

Verification of the conformity of the raw materials to the reception sheets.

## 5.2 On particle boards

Once per hour:

- Dimensional, straightness, squareness control

Per production run and once every 6 hours:

- Density check ≥ 720 kg/m$^3$ according to ASTM D 2395 method A (corresponds to EN 323)
- Moisture content check ≥ 3 to 6 % according to ASTM D 4442 method B (corresponds to EN 322)
- Internal bond strength check ≥ 0.60 N/mm2 according to ASTM D 1037 (corresponds to EN 319)
- Swell check ≤ 7 % according to ASTM D 1037 (corresponds to EN 317)
- Water absorption check (immersion for 24 hours) ≤ 15% according to ASTM D 1037 method B (corresponds to EN 317)
- Internal bond strength after boil test ≥ 0.15 N/mm² according to EN 1087-1
- Bending strength check:

**certified value** ≥ 15 N/mm² according to ASTM D 1037 (corresponds to EN 310)

- Module of elasticity check:

**certified value** ≥ 2,050 N/mm² according to ASTM D 1037 (corresponds to EN 310)

### 5.3 In-process checks

- On the profiles before painting, once every ½ hour: dimensions, straightness
- On the additives: density, viscosity
- On the paints: grammes per square metre, colour.

### 5.4 On finished products

On all panels:

- Visual inspection

Per production run and once/week:

- Film thickness check: ≥ 65 µm.

Per production run and once/week:

- formaldehyde emission check ≤ 0.124 mg/m$^3$

## 6. Identification

Naturetech™ sidings with a certificate are identifiable by marking that is compliant with the "Special certification requirements for built-up claddings, siding, insulated weatherboarding and under-roof trims" and they include in particular:

**On the product**

- The logo,
- The certificate number,
- The identification marking of the production batch

**On the pallets**

- The logo,
- The certificate number,
- The name of the manufacturer,
- The trade designation of the system and the trade designation of the product,
- The Technical Appraisal number.

In addition to its compliance with the certification regulations, on the label stapled to each pallet and package, the marking also shows the brand name, the type of siding, the colour, the dimensions and the quantities.

## 7. Supply – Technical assistance

The company KWP does not directly provide installation services; it distributes and delivers Naturetech™ lap sidings and basic accessories specific to the Naturetech™ system (retouch paint and stain and Naturetech™ colour-matched acrylic sealants) to installation companies.

Upon request, the distributor can also supply the lap fixing nails.

All other elements are directly procured by the installer, in compliance with the recommendations given in this Technical File.

The company KWP has a technical department which can provide, at the request of the installer, technical assistance with both the study for a project and its execution stage.

## 8. Deployment of thermal insulation and framework

### 8.1 Thermal insulation

The ACERMI certified insulation is deployed in accordance with the "General rules for the design and deployment of timber framework and thermal insulation for built-up cladding forming the subject of a Technical Appraisal" (*Cahier du CSTB* 3316-V2).

### 8.2 Timber framework

The deployment of the timber framework will comply with the requirements of the *Cahier du CSTB* 3316-V2 with the addition of the following specifications:

- The coplanarity of the uprights must be verified between adjacent uprights, with a maximum acceptable gap of 2 mm.
- At installation, the timber studs and laths must have a maximum target moisture content of 18%, with a variation between two elements of no more than 4%. The moisture content of the elements must be determined in accordance with the method described in the standard NF EN 13183-2 (using a probe moisture meter).
- The permissible vertical load resistance of the angle bracket to be taken into account must be that corresponding to a load-deformation characteristic of 3 mm.
- Timber studs with a mechanical strength corresponding to at least strength class C18, according to standard NF EN 338, having a Class 2 natural or conferred durability of use with a protective strip or 3b, according to FD P 20-51.
- The maximum centre distance between the lap support studs or furring strips is 400 mm. In the case of a 600 mm centre distance (or 645 mm on a TFB) or a horizontal installation of Naturetech™, installation is carried out on a double framework structure.

## 9. Deployment of the sidings

### 9.1 General points

The distributor does not directly carry out installation. Deployment is the responsibility of installation companies to which the distributor provides technical assistance, at their request. To this end, it has drawn up a detailed installation manual, written in French.

Depending on the type of lap siding, installation can be carried out horizontally, vertically or diagonally, onto flat vertical surfaces.

### 9.11 Storage

Naturetech™ lap sidings must be stored outside, preferably under an awning, under original covers supplied for the purpose of allowing adaptation to the ambient temperature and humidity; they must remain laid flat on the pallets supplied. The cladding must be stored under these conditions on the site for several days before deployment, to allow adaptation to the local temperature and humidity conditions and they must remain laid flat on the pallets supplied.

### 9.12 Ventilation

Ventilation is important irrespective of the substrate or the orientation of the laps.

Ventilation must be assured at several levels:

- At the bottom, starting installation of the laps at least 20 cm above finished ground,
- At the top, leaving a gap of 20 mm, taking care never to jam the laps,
- At window or door reveals, by cutting the laths to allow air circulation.

### 9.13 Cutting

Naturetech™ sidings are cut using a fine-toothed saw on the painted side. Small cuts can be made with a jig saw.

The edges cut in this way must be protected by the application of either a sealant joint of colour-matched Naturetech™ acrylic sealant, or a joint moulding profile or an appropriate angle as specified in § 10.5.

### 9.2 General installation principles

A layout plan must be prepared in advance. There is no particular direction of installation.

- Installation involves the following operations:
- Fitting of studs or furring strips to the substrate (masonry or timber, with or without insulation),
- Installation of the starter profiles,
- Installation of the laps,
- Fitting of the finish accessories,
- Completion of all related works and any finishes.

Before nailing a lap, ensure that it is well interlocked with the previous lap.

Like timber, Naturetech™ laps are subject to dimensional variations according to the hygrometric conditions. It will be important to take account of this during installation, in particular in periods of dry weather, by creating 8 mm clearances at the ends of the laps, to allow for expansion (at corners, windows and doors etc.). The Naturetech™ joint mouldings are profiled in such as way as to allow for expansion.

## 9.21 Horizontal installation (*see Figures 2 and 3*)

All Naturetech™ profiles can be installed horizontally.

The laps are fitted horizontally fitting onto vertical studs spaced at a centre distance of no more than 400 mm.

The fitting of the first lap at the bottom requires the installation of a starter strip, which supports the lower laps. Up to a height of 200 mm, it is advisable to reduce the centre distance between the timber furring strips or studs to ensure that the starter strip remains securely in place.

The laps are fixed to vertical studs by means of concealed nailing at the top edge of the laps. A groove at the top of the plank indicates the positioning of the nails.

Both ends of the lap must coincide with a support.

The abutment of the sidings is achieved either by the use of joint mouldings or the use of Naturetech™ colour-matched acrylic sealant. They must be nailed at the top edge onto the timber upright.

## 9.22 Vertical installation (*See Figure 4*)

Only the Naturetech™ Provincial profiles can be installed vertically.

The laps are fitted vertically onto horizontal studs with a centre distance not exceeding 400 mm. The studs must be at least 30 mm thick.

To allow for effective air circulation, installation must be carried out on a double framework structure, on counterbattening.

The laps are fixed to the horizontal furring strips by means of concealed nailing at the top edge of the laps. Grooving at the top edge of the strip indicates the positioning of the nails.

Both ends of the lap must coincide with a support.

There must be a 8 mm space between two laps to allow for their expansion, according to temperature and humidity fluctuations.

In vertical installation, the sidings must not be abutted. The height is therefore limited to 3.60 m (length of the profile).

For heights above 3.60 m, abutment can be replaced by a horizontal dividing joint

## 9.23 Diagonal installation (*see Figure 5*)

All Naturetech™ profiles can be installed diagonally, at up to 45° from the horizontal.

Only the Provincial profiles can be installed at up to 90° from the horizontal.

For diagonal installation, the laps are fitted diagonally onto vertical furring strips or studs spaced at a maximum centre distance of 300 mm.

For an angle greater than 50° (from the horizontal) the laths must be arranged horizontally and cross-lathing will be necessary.

The laps are fixed onto the furring strips by means of concealed nailing at the top edge of the laps. Grooving at the top edge of the laps indicates the positioning of the nails.

Both ends of the lap must coincide with a support.

The sidings are abutted by means of the Naturetech™ colour-matched acrylic sealant. There must be an 8 mm space between two laps to allow for their expansion according to temperature and humidity fluctuations.

On the intermediate sections of the facade, the laps are fitted with staggered joints.

## 9.24 Air gap ventilation

An air gap of at least 20 mm is always created between the outer bare face of the substrate wall or the insulation and the rear face of the fastening relief portion, and at air vents in accordance with the *Cahier du CSTB* 3316-V2.

Corners can be treated by the use of timber profiles conforming to NF DTU 41.2, or other accessories defined in this documents.

The joint between the lap and the [corner] profile must be sealed with a Naturetech™ acrylic sealant for a corner profile that does not extend behind the sidings.

**External corners** (*see Figures 9 and 9a*)

External corners can be treated with an accessory made of 8/10 mm painted aluminium sheet listed as an "exterior corner". This profile must be installed over the Naturetech™ sidings as installation progresses.

**Internal corners** (*see Figures 8 and 8a*)

Internal corners can be treated with a profile in 8.10 mm painted aluminium sheet, listed as an "interior corner". This profile must be installed on the furring strips before installation of the Naturetech™ laps.

### 9.32 Treatment of window sills

Leave a 20 mm gap between the upper end of the furring strips and the bottom of the window (*see Figure 14*).

### 9.33 Treatment of lateral cladding ends

Lateral cladding ends can be finished with profiles in 7/10 mm painted aluminium sheet listed as:

- "J moulding" for the Prestige, Heritage, Provincial, Distinction, Laurentian and Classic,
- "F13 moulding" for the Prestige, Heritage, Provincial, Distinction, Laurentian and Classic.

For a vertical end (see Figures 7 and 7a) these profiles must be fitted onto the furring strips before the Naturetech™ sidings are installed.

### 9.34 Treatment of façade bottoms (*See Figure 10*)

An anti-rodent grill is required at the bottom of the facades.

### 9.35 Miscellaneous treatments

Additional trim profiles can be installed to treat particular features. These are profiles commonly used in the deployment of traditional built-up claddings, made of pre-painted folded sheet, in particular for the drip cap, the roof edge cover and the window frames, and also profiles for forming exterior insulation.

Most are shown in the catalogue for specialist suppliers; others require custom fabrication as required by the project site, and must meet the specifications below.

Metal trim profiles (refer to the standard NF P 24-351 with regard to the corrosion protection of the metal sheets according to local environmental conditions):

- Anodically oxidized aluminium sheet Class 15 or 20 according to the standard NF EN 1396- Thickness 10/10 mm or 15/10 mm.
- Galvanised steel sheet, at least Z 350 according to the standard NF P30-310, minimum thickness 10/10 mm.
- Galvanised steel sheet, at least Z 275 and pre-painted according to the standard NF P34-301, minimum thickness 10/10 mm.

Installation on TFBs

The substrate wall conforms to NF DTU 31.2 of 2019.

The framework is separated at each floor line.

A waer-resistant cover conforming to NF DTU 31.2 of 2019 will be provided on the exterior face of the TFB wall, under the vertical furring strips

In situations a, b and c, the TFB bracing panels can be positioned on the inside or outside of the wall.

In situation d, if the TFB bracing panels have been positioned on the inner side of the wall, timber panels must be positioned on the outer side of the wall.

The water-resistant barrier is overlapped every 6 m for the discharge of runoff water to the exterior.

Under no circumstances must the water-resistant barrier be fitted abutting against the Naturetech™ laps (minimum 20 mm air gap)

Figures 17 to 22 illustrate the minimum arrangements for deployment on a TFB.

The laps will be nailed, in accordance with the specifications given in § 3.2, onto a framework meeting the requirements of § 3.3.

## 9.3 Particular features

Figures 6 to 16a offer a catalogue of examples of the treatment of particular features.

### 9.31 Treatment of corners

If aluminium interior or exterior corner pieces are used, they must be fitted before the cladding.

The cladding must be abutted at the interior and exterior corners leaving a space of 5 mm between the end of the lap and the corner.

**For horizontal installation (maximum centre distance of 400 mm on a TFB structure)** (*see Figure 18*)

In the case of a TFB building structure with a centre distance of 400 mm and horizontal cladding installation, the cladding support framework can be installed directly onto the TFB uprights.

Dimensions of the studs :

- Minimum exposed width: 60 mm,
- Minimum thickness: 27 mm,
- Maximum centre distance between studs: 400 mm.

**For horizontal installation (centre distance on TFB structure > 400 mm)** (*see Figure 19*)

In the case of a TFB building structure with a centre distance of 645 mm and horizontal installation of the Naturetech™ cladding, installation is carried out on a double framework structure. The horizontal furring strips fixed to the TFB uprights have a minimum cross-section of 27 x 60 mm.

**For vertical installation** (*see Figure 20*)

Installation is carried out on a double framework structure. The vertical furring strips fixed to the TSB uprights have a minimum cross-section of 27 x 60 mm. The horizontal studs fixed to the furring strips have a minimum cross-section of 32 x 60 mm.

In all three cases, the furring strips are fixed to the TSB uprights. The furring strips fixing must penetrate at least 30 mm into the framework timbers and any stress-bearing lining.

**Fixings for studs and furring strips**

The fixing of the studs and furring strips must sink at least 25 mm into the furring strips. This can be achieved by means of 4.00 x 60 mm CE marked screws conforming to NF EN 14592

Depending on the configuration, the furring strips or studs are fixed directly onto the TFB uprights. These fixings must sink at least 30 mm into the framework timbers and any stress-bearing lining. This can be achieved by means of 4.00 x 60 mm CE marked screws meeting the requirements of NF EN 14592.

Other fixings of the same nature, with identical dimensions and equal or higher characteristics can be used.

Where studs and furring strips with a thickness exceeding those listed above are used, the length of the fixings must be increased in order to achieve the stipulated minimum penetration.

## 10. Maintenance and repair

Naturetech™ lap sidings have been designed to maintain their finish appearance over the years without the need for any specific maintenance.

### 10.1 Routine maintenance

Naturetech™ lap sidings can easily be cleaned with water and a non-abrasive detergent. For heavily soiled surfaces, it is advisable to use a high-pressure cleaner, limiting the pressure to 60 bars and observing a minimum distance between the nozzle and the surface of 20 cm.

Small damaged areas can be repaired using Naturetech™ retouch paint and stain.

### 10.2 Renovation by painting

After a period of 10 years, it is possible to apply a new coat of paint to the Naturetech™ lap sidings.

After cleaning, apply a paint recommended by the company Kaycan International. One or two coats of this paint can be applied with a brush, roller or sprayer.

### 10.3 Residing

A lap can be replaced by visibly nailing on a new standard lap.

After sawing the damaged siding longitudinally (with a jig saw, for example), the lower section can be removed easily. To remove the upper section, it will be necessary to use a pry bar to extract the nails that are in place.

The new lap is pre-prepared by removing the wedge section of the lower interlock and it can then be slid under the lower edge of the lap above it.

The two edges are refixed by means of ring nails, and the nail heads remain exposed.

# B. Experimental results

Naturetech™ lap sidings have undergone numerous tests in Canada and the United States, according to the requirements of the standards CAN/CGSB 11.3 and 11.5 which govern the characterization of fibre and particle boards and wood-based claddings, and conducted by Intertek and Forinek.

- Characterisation tests (flexural modulus and bending strength before and after the boil tests) on the fibre board according to EN 310 and EN 1087-1 conducted in Germany at the MPA (materials research and testing institute) Stuttgart (report no. 51220-902.1173.000/1 of 16/03/2011).
- Characterisation tests (dimensional variations) on the fibre board according to EN 318, conducted in Germany at the MPA Stuttgart (report no. 51220-902.1173.000/2 of 04/05/2011).
- Swell and internal bond strength test according to ASTM D1037/EN 317 and EN 319, conducted in Canada by Intertek (report no. 301006682 of 21/06/2012).
- Artificial aging tests according to EN 927-6 conducted in France at the FCBA institute (report nos. 404/11/83-1 to 404/11/83-3 of 05/07/2011 and 06/07/2011).
- Reaction to fire tests according to EN 13501-1 conducted at the LNE (French National Laboratory of Metrology and Testing) (report no. P149789 of 22/02/2016).

  This report validates behaviour in the following conditions:

  - Fixed mechanically to a timber framework on a concrete, masonry or TSB substrate,
  - With thermal insulation classified at least A2-s1, d0, or without insulation, with an air gap of 20 mm
- Wind strength tests according to the *Cahier du CSTB* 3517 conducted in Canada by Intertek (report no. 100350201COQ-003 of 01/04/2011).
- Impact resistance tests for performance maintenance according to NF P 08-301 and NF P08-302 conducted in Scotland by the Building Performance Assessment Centre (report no. KWP01_BF-114_001 of 27/07/2011).
- Technical evaluation report of the CNRC (National Research Council Canada) CCMC 13384-L certifying the conformity of the board to Type 5 of the standard CAN/CGSB-11.3-M87."

# C. References

## C1. Environmental data[1]

The Naturetech™ process does not form the subject of an Environmental Statement (ES). It cannot therefore claim any particular environmental performance.

In particular, the purpose of the data given in an ES is to offer a calculation of the environmental impacts of the structures into which the processes in question are liable to be incorporated.

## C2. Other references

In France, 454,000 m² have been realized since 2013, including more than 39 000 m² on TFB.

[1] Not examined by the Specialized Group as part of this Appraisal

# Data sheet tables and figures

***Table 1 – Permissible wind resistance, according to the modified NV 65 regulations, of the laps under negative pressure (Pa)***

| Type of Siding | Centre distance between nails/battens (mm) | Permissible resistance under negative pressure (Pa) |
|---|---|---|
| **Prestige Provincial** | 400 | 970 |
| **Laurentian** | 400 | 1,050 |
| **Distinction Heritage** | 400 | 1,750 |

***Tableau 2 – External impact strength of the laps according to standard P08-302 on easily replaceable walls***

| Type of Siding | Centre distance between battens (mm) | Classification |
|---|---|---|
| **Prestige Provincial** | 400 | **Q4** |
| **Laurentian** | 400 | **Q4** |
| **Distinction Heritage** | 400 | **Q4** |

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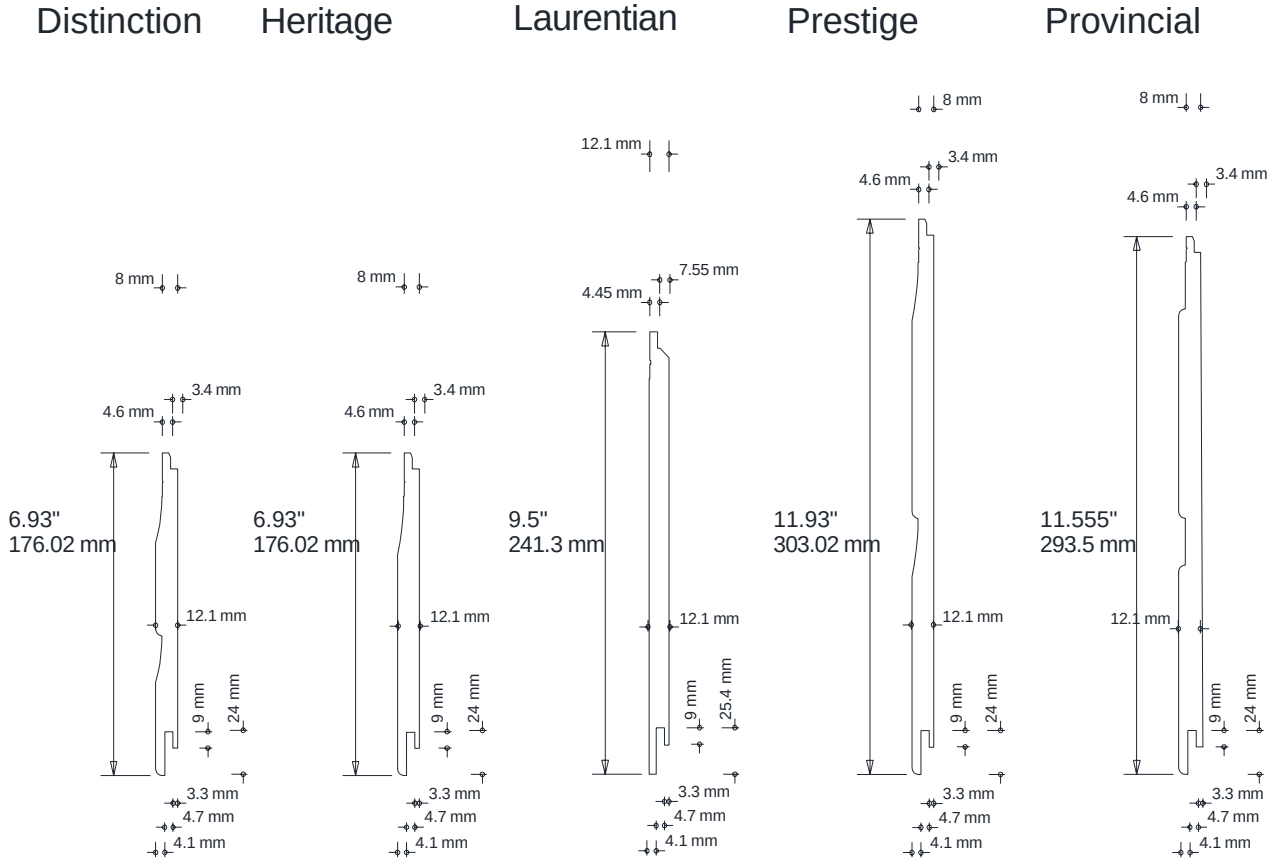



***Figure 1 – Lap sidings***

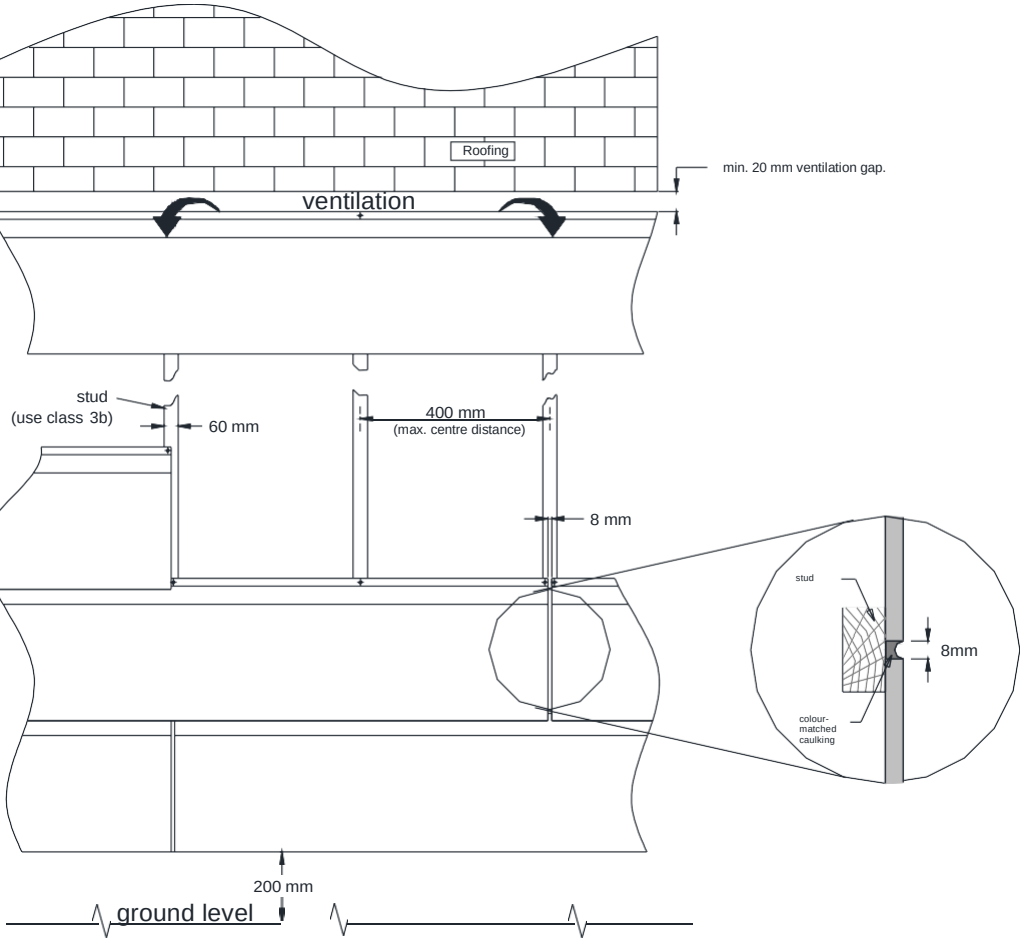



***Figure 2 – Schematic diagram – Horizontal installation with sealant***

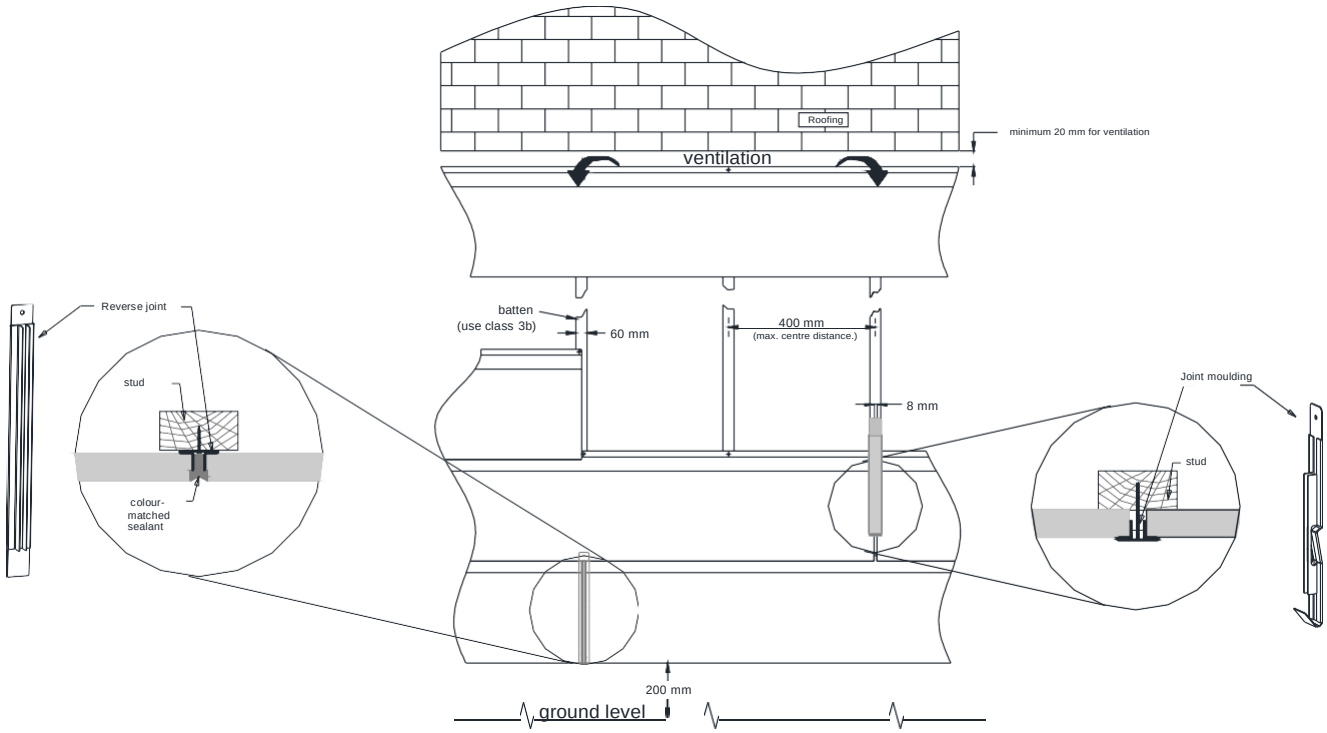



***Figure 3 – Schematic diagram – Horizontal installation with moulding***

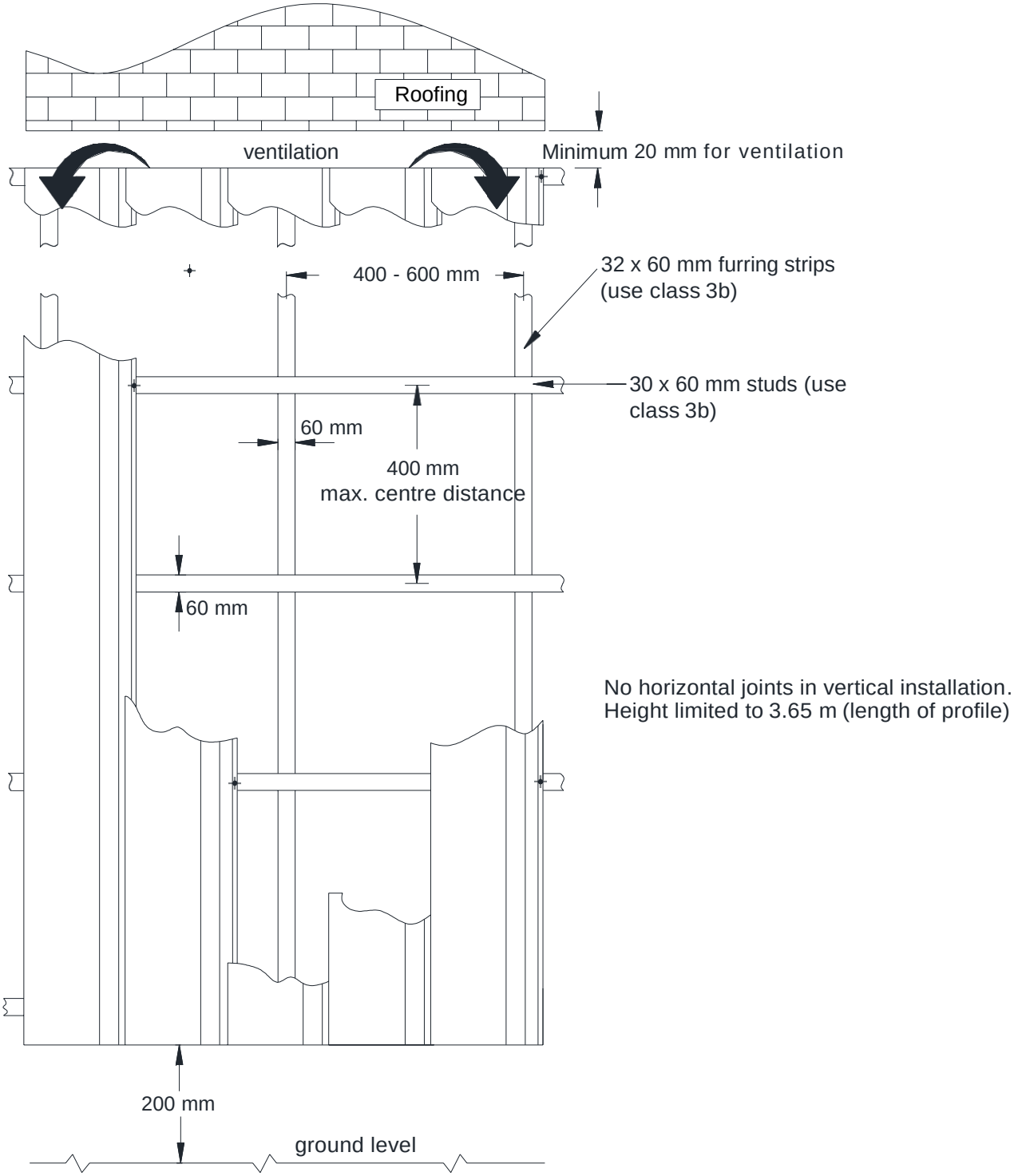



***Figure 4 – Schematic diagram (PROVINCIAL lap siding) – Vertical installation on a double framework structure***

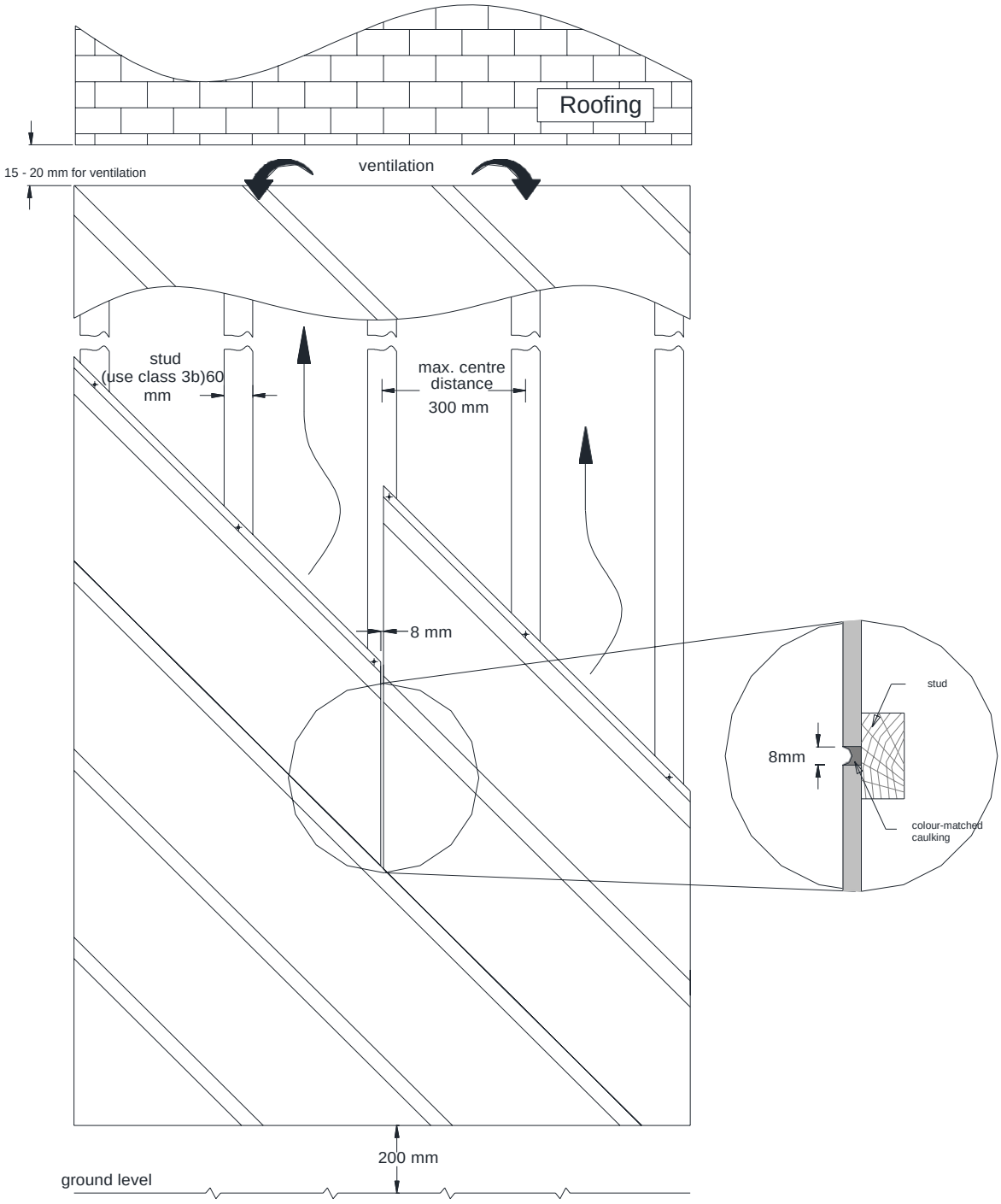



***Figure 5 – Schematic diagram – Diagonal installation***

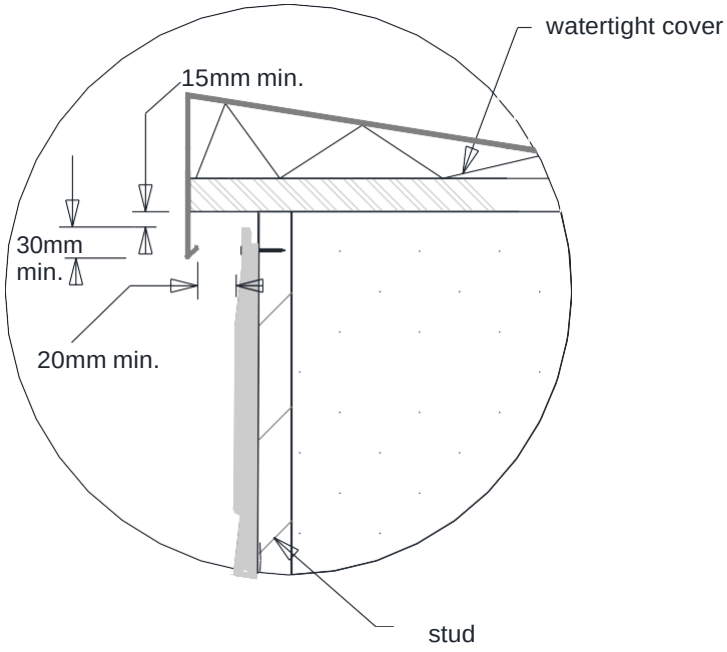



***Figure 6 – End with a roof edge – Direct installation***

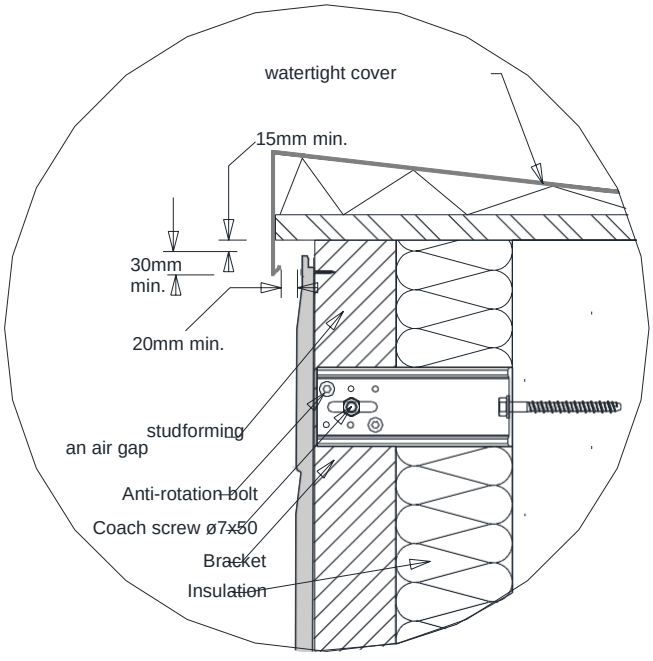



***Figure 6a – End with a roof edge –Installation with boarding***

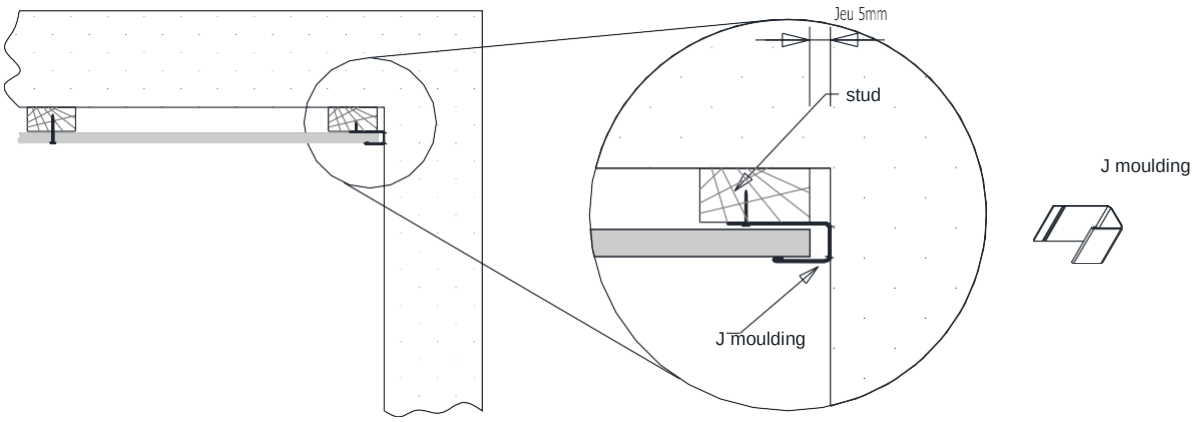



***Figure 7 – Side end against a wall (J moulding)***

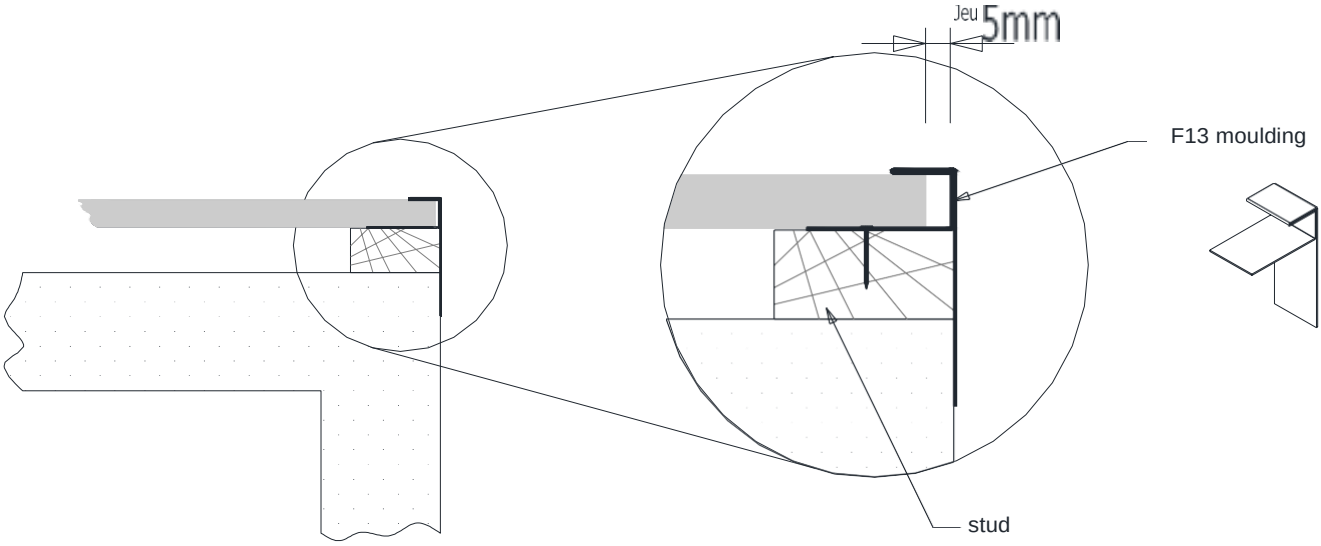



***Figure 7a – Outside side end (F 13 moulding)***

Jeu 5 mm - 5 mm clearance

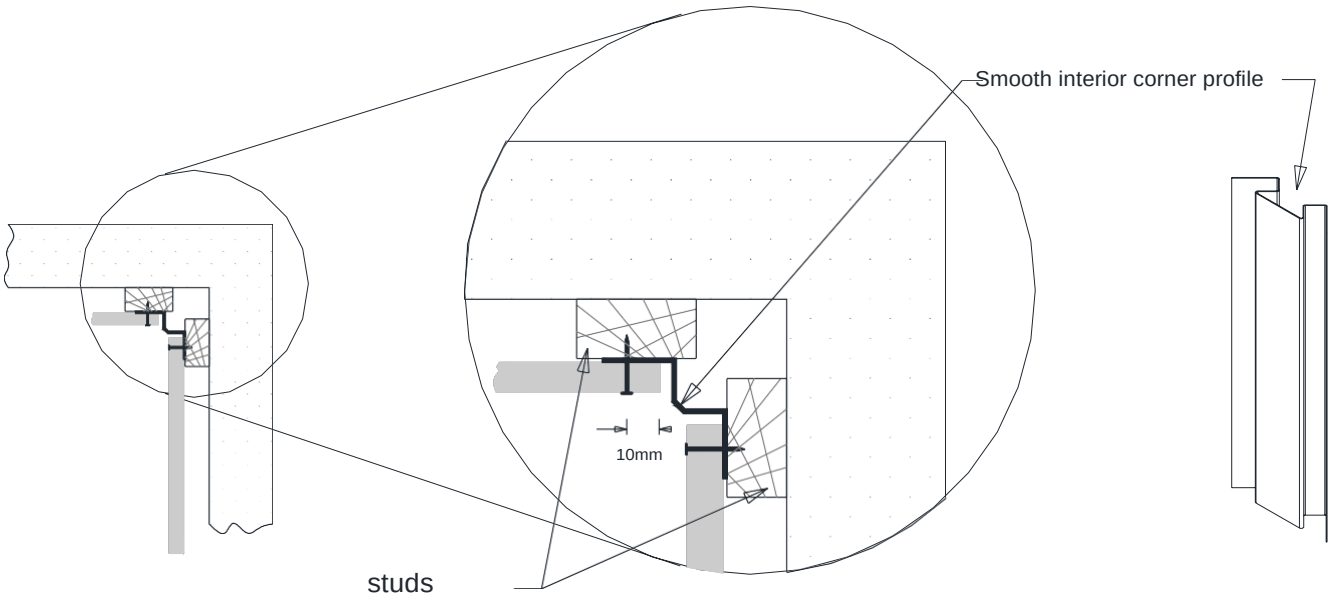



***Figure 8 – Inside corner – Direct installation***

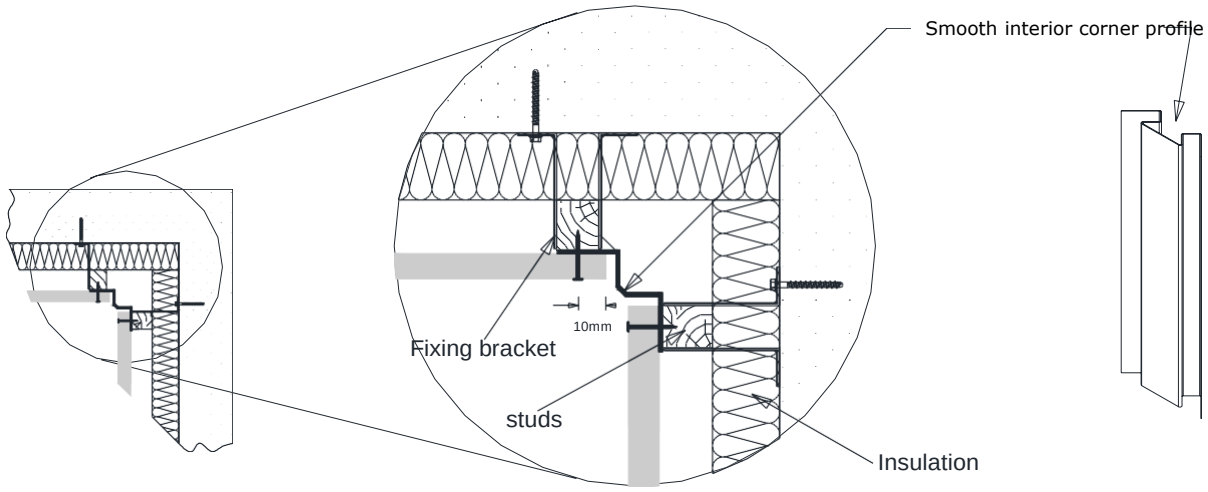



***Figure 8a – Inside corner –Installation with boarding***

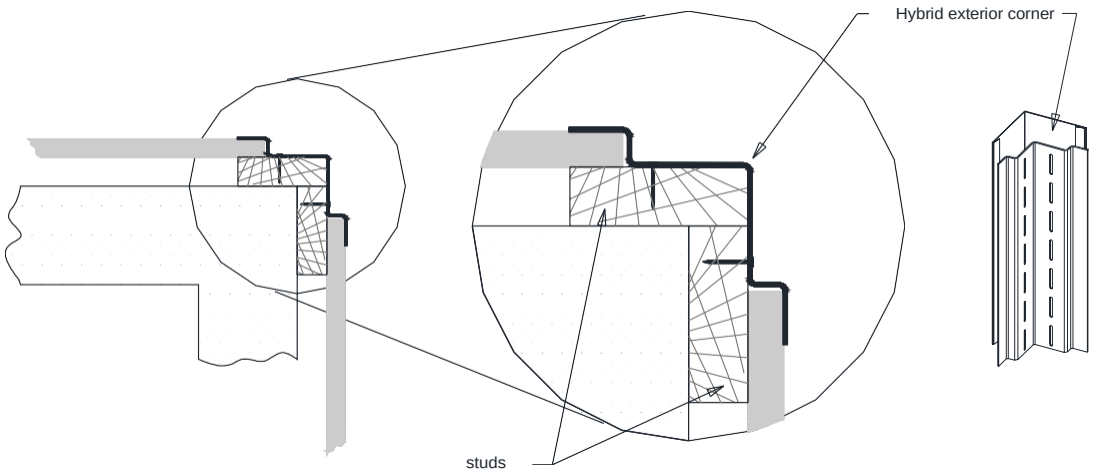



***Figure 9 – Outside corner – Direct installation (hybrid exterior corner)***

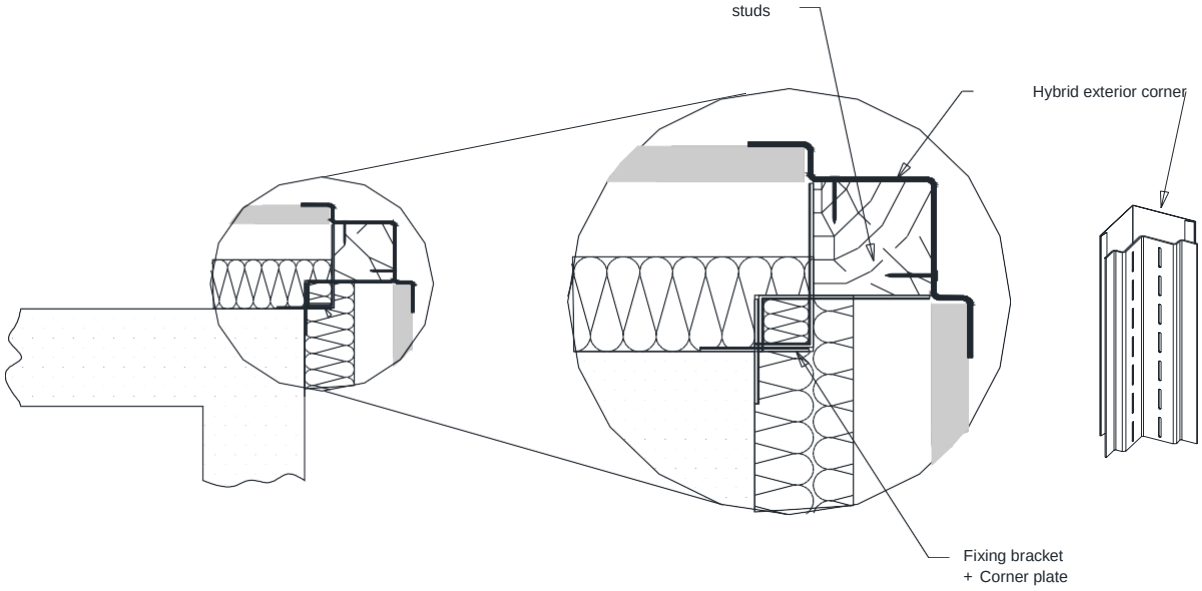



***Figure 9a – Outside corner – Installation with boarding (hybrid exterior corner)***

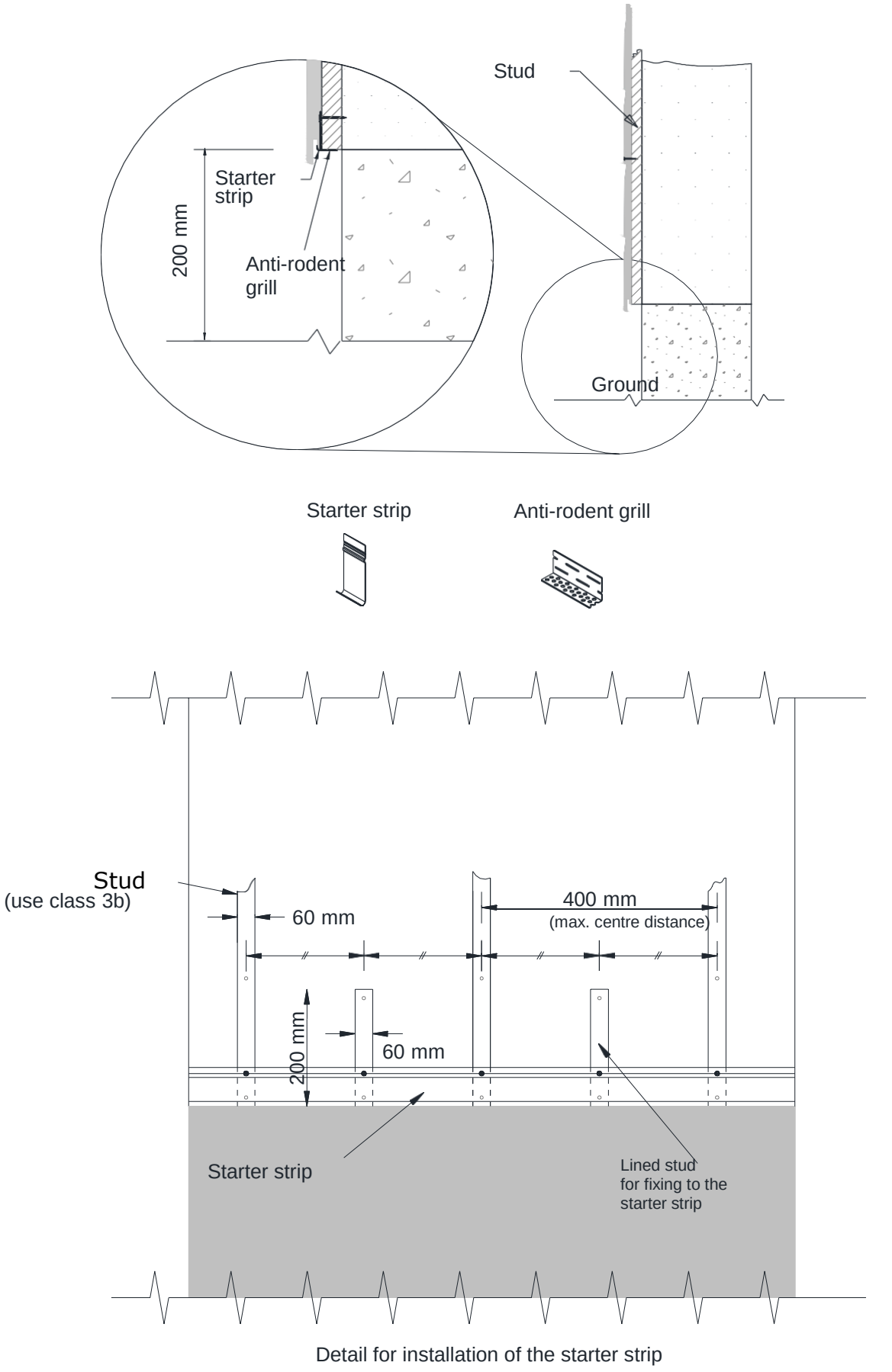



***Figure 10 – Siding starter – Direct installation***

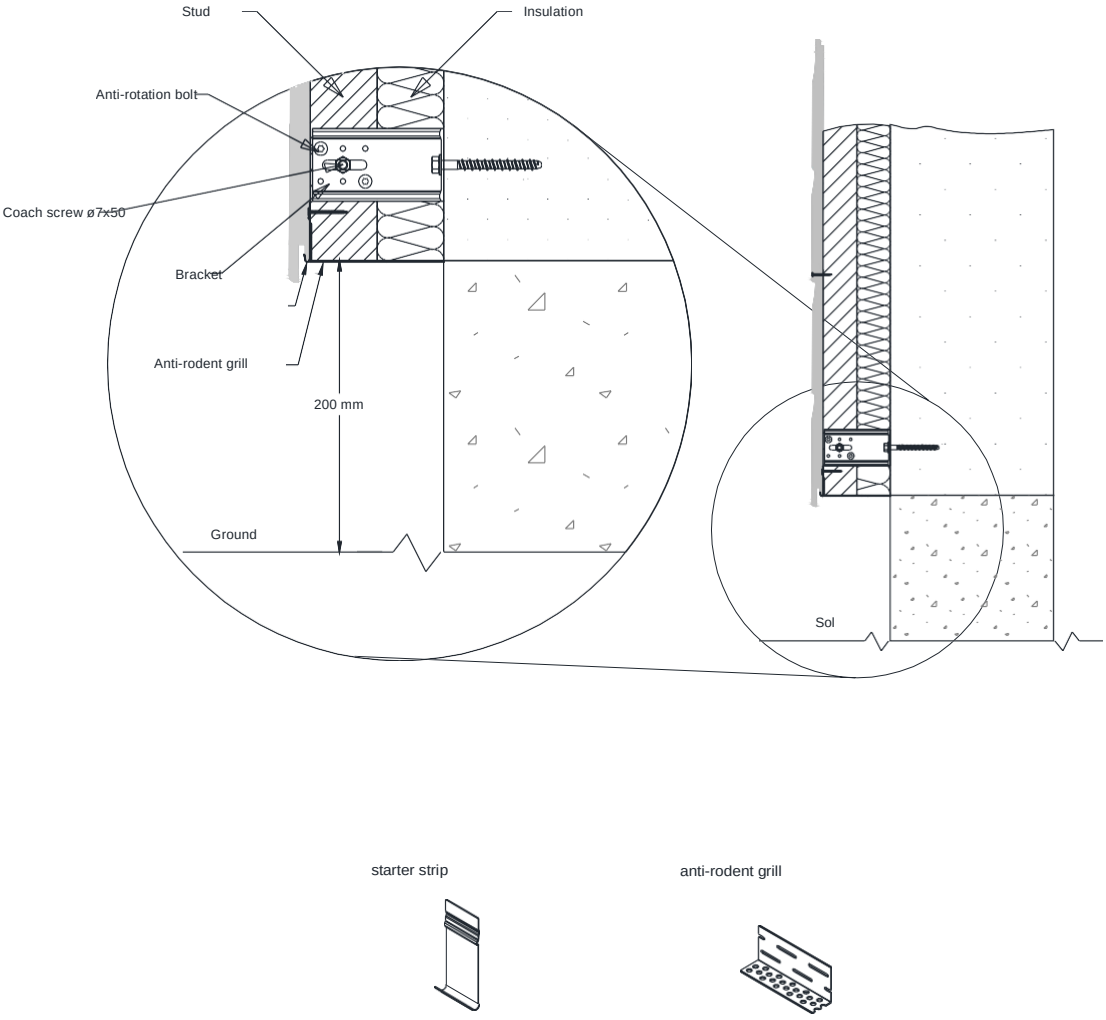



***Figure 10a – Starter – Installation with boarding***

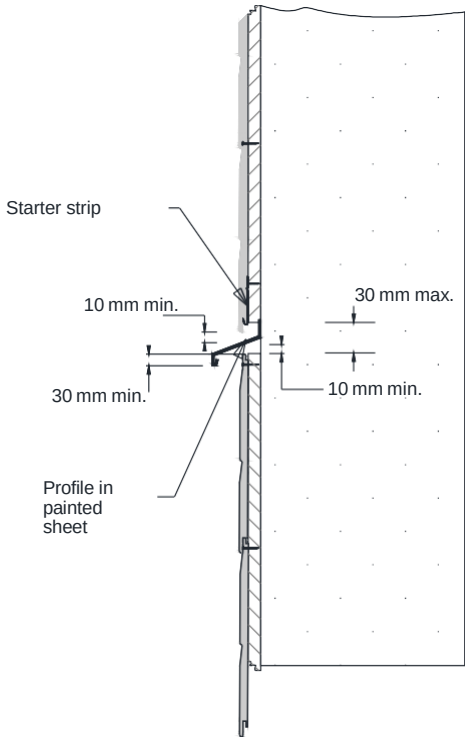



***Figure 11 – Horizontal air gap separation – Direct installation***

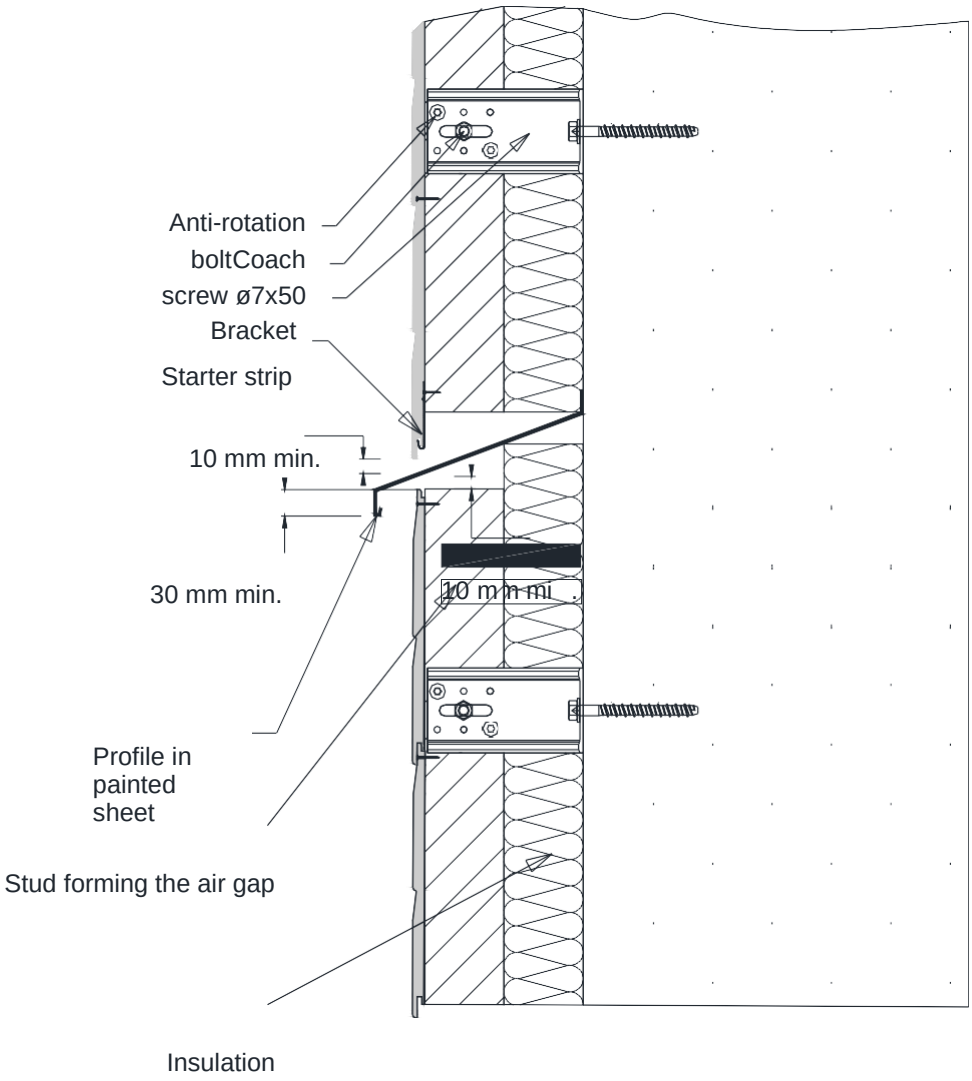
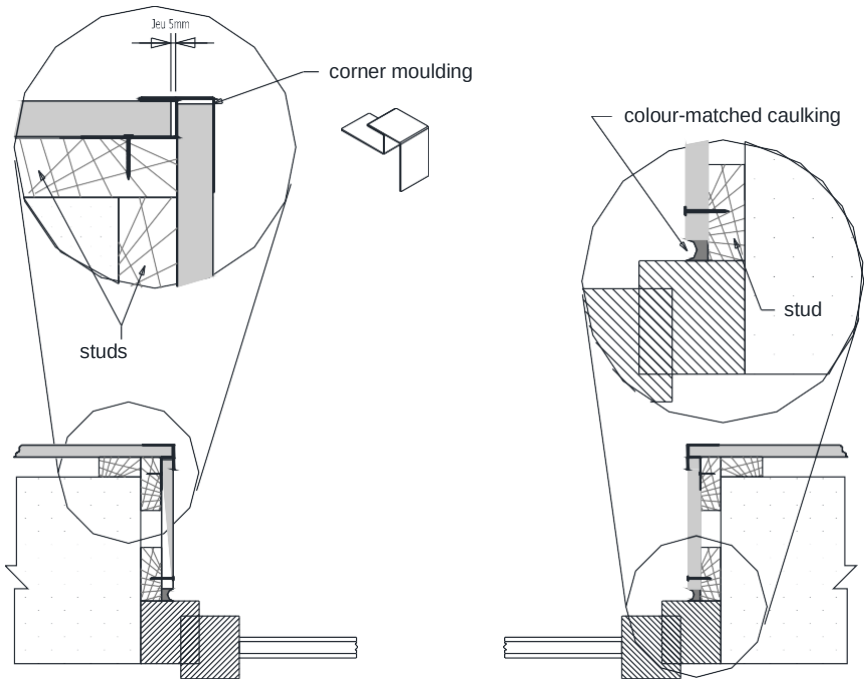
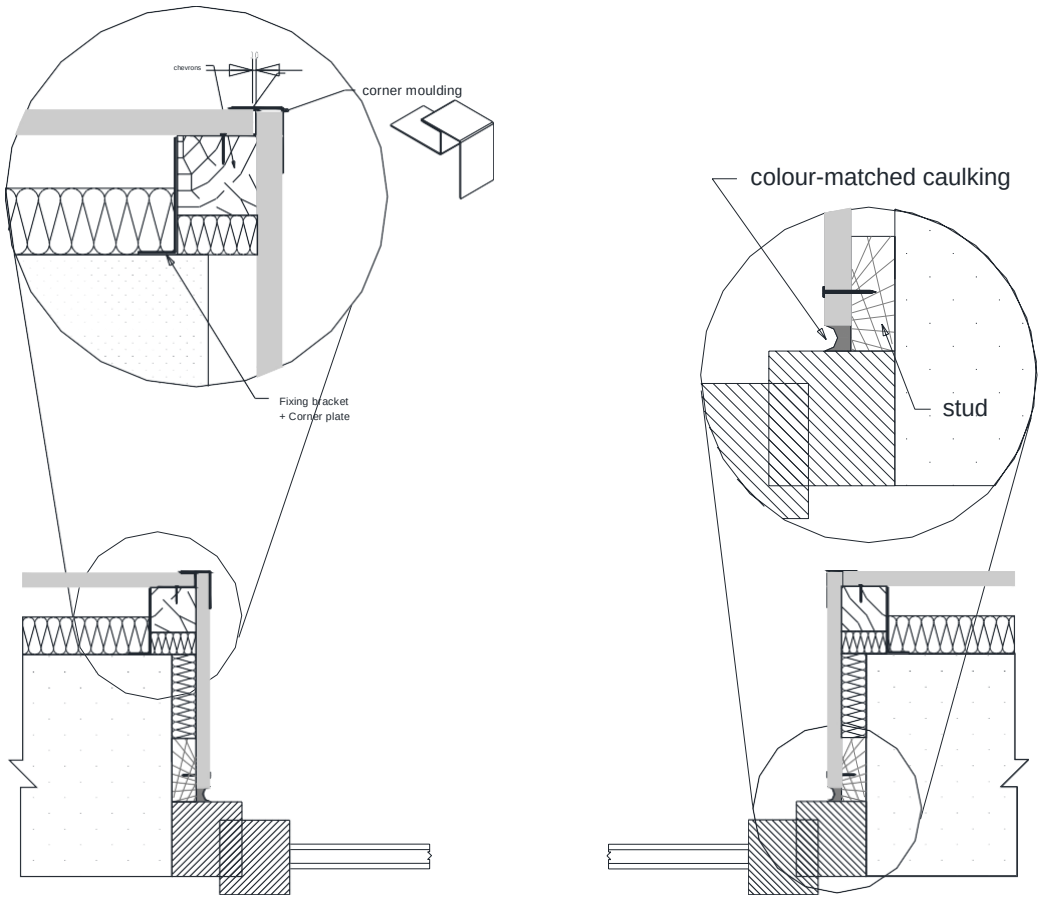



***Figure 11a – Horizontal air gap separation – Installation with boarding***




Note: Detail shown with an exterior corner moulding.
Refer to the detail figures of exterior corners for other corner configurations.

***Figure 12 – Reveal – Direct installation (horizontal section)***




Note: Detail shown with an exterior corner moulding.
Refer to the detail figures of exterior corners for other corner configurations.

***Figure 12a – Reveal – Installation with boarding (horizontal section)***

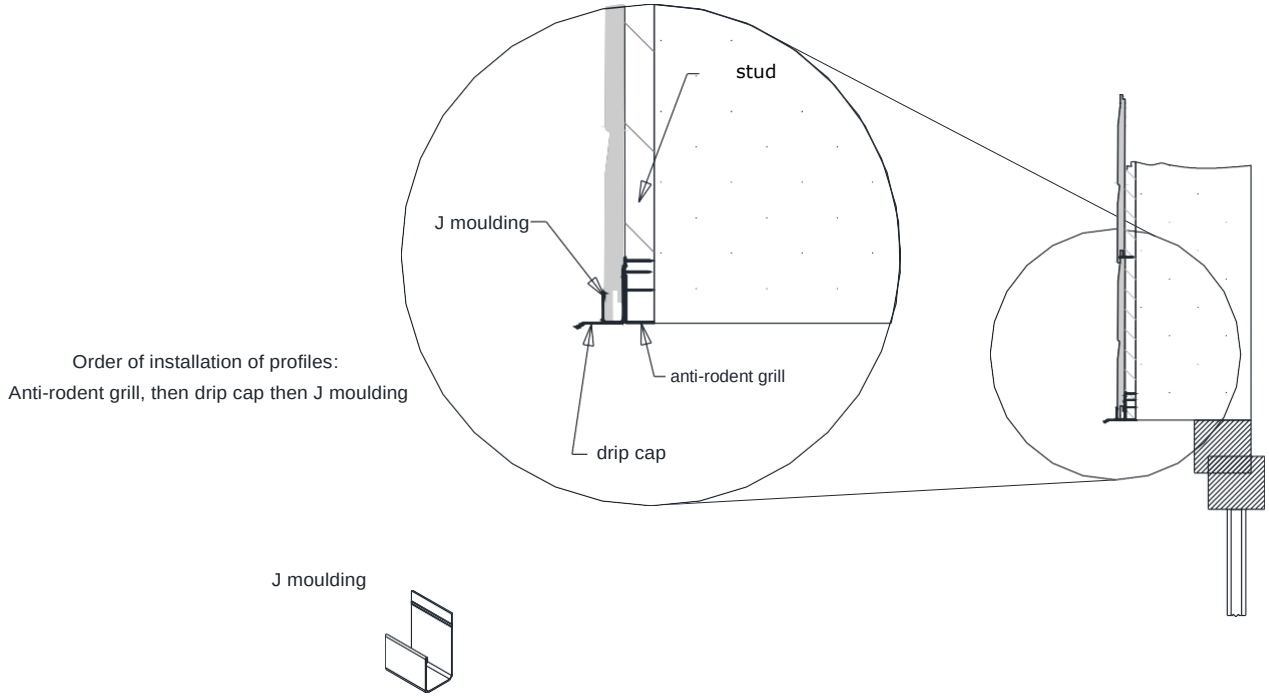



***Figure 13 – Lintel – Direct installation (vertical section)***

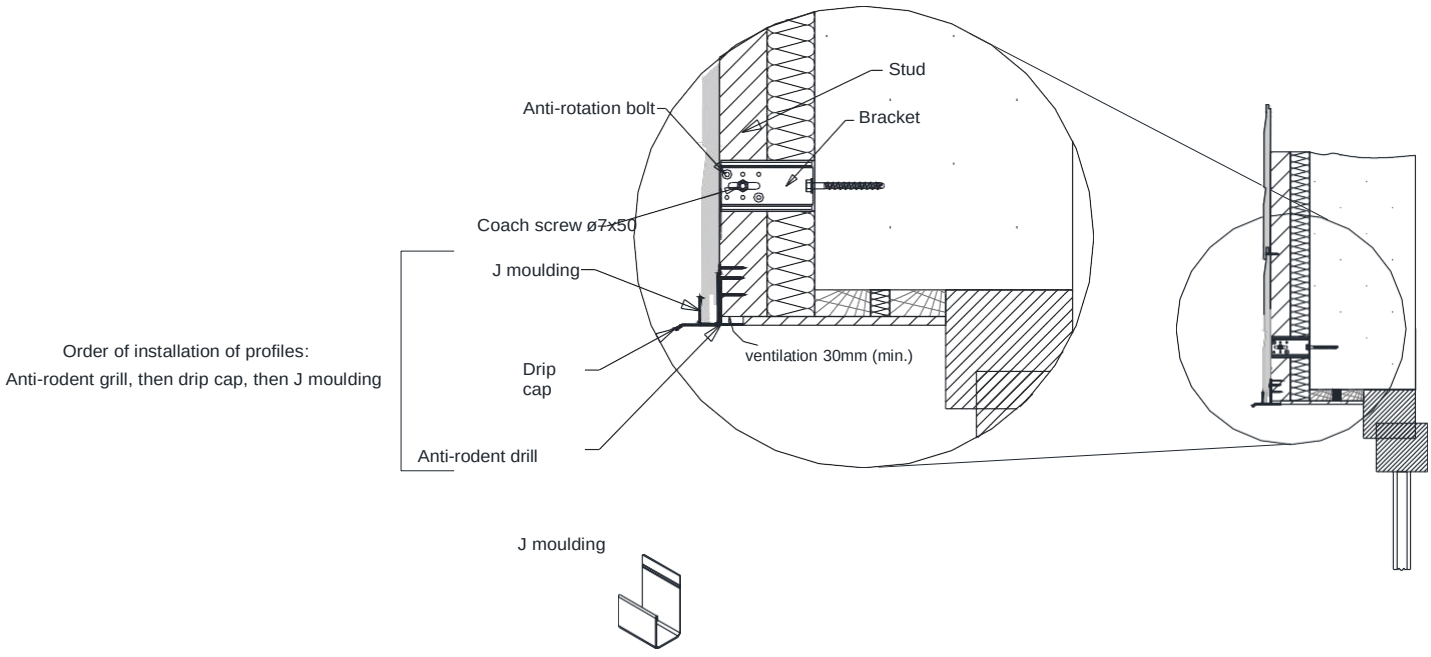



***Figure 13a – Lintel – Installation with boarding (vertical section)***

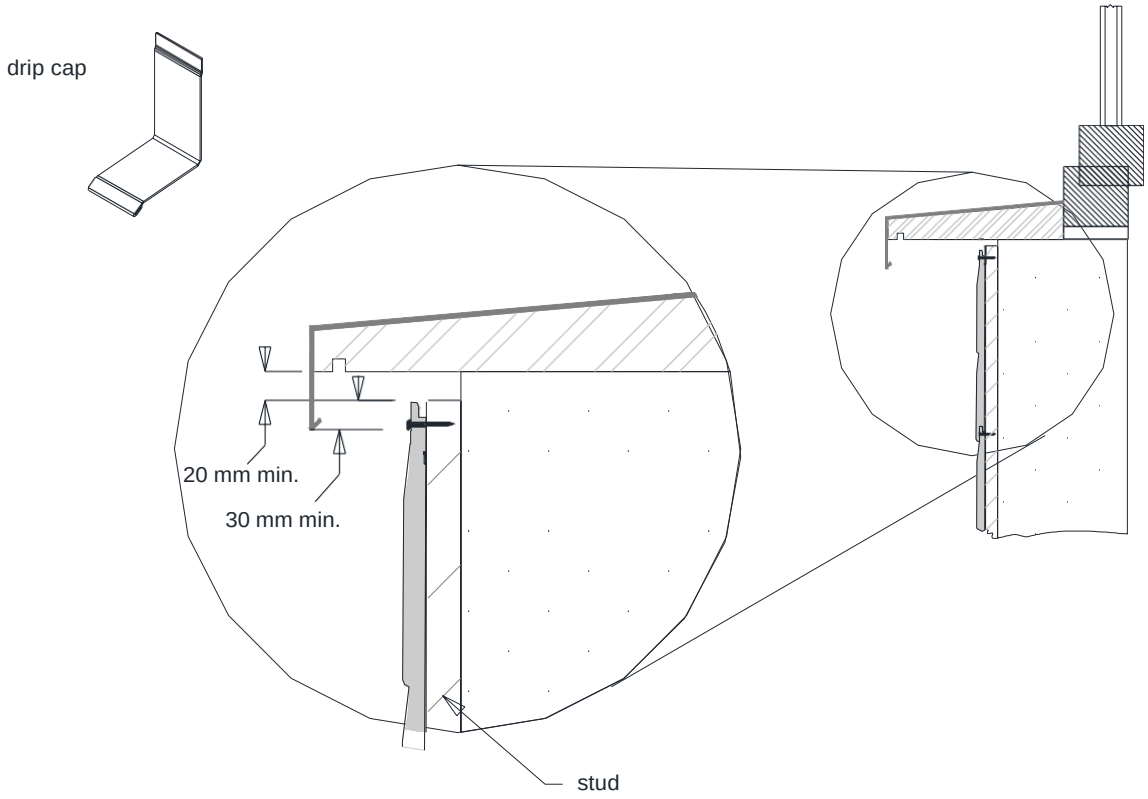



***Figure 14 – Sill – Direct installation (vertical section)***

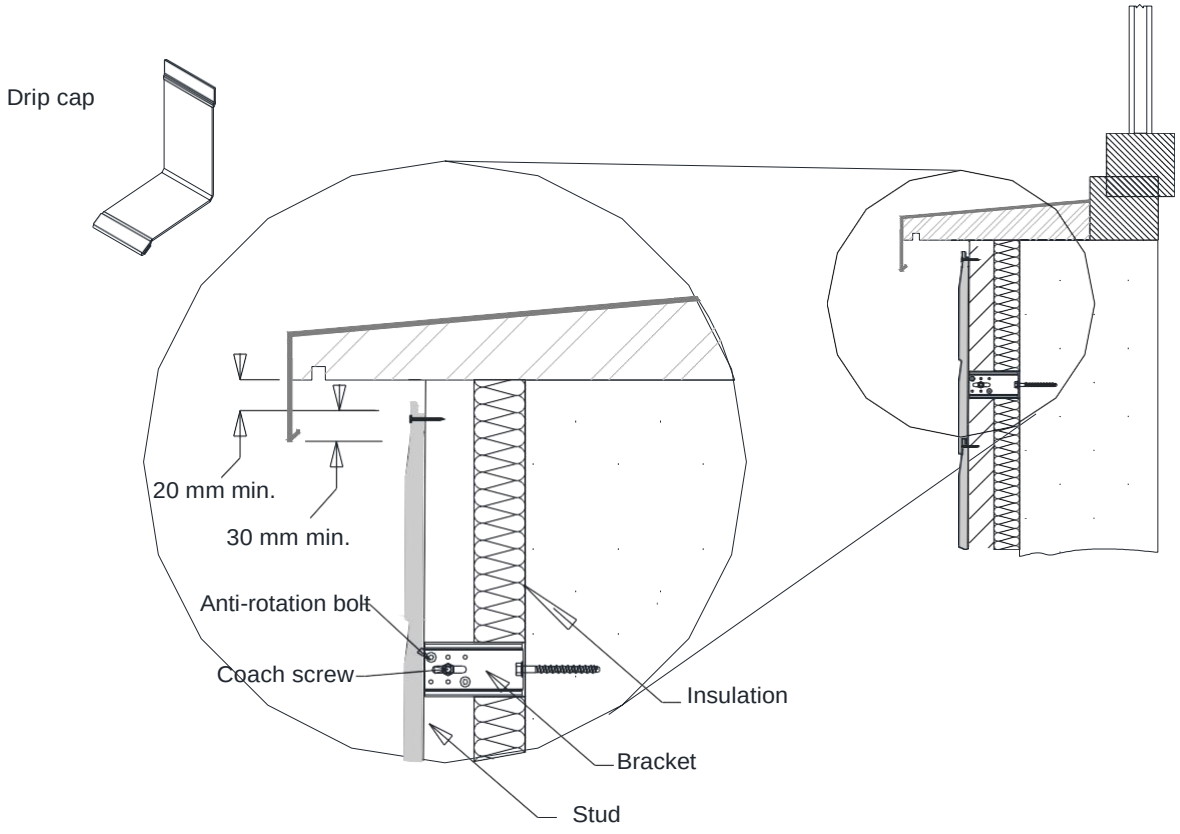



***Figure 14a - Sill – Installation with boarding (vertical section)***

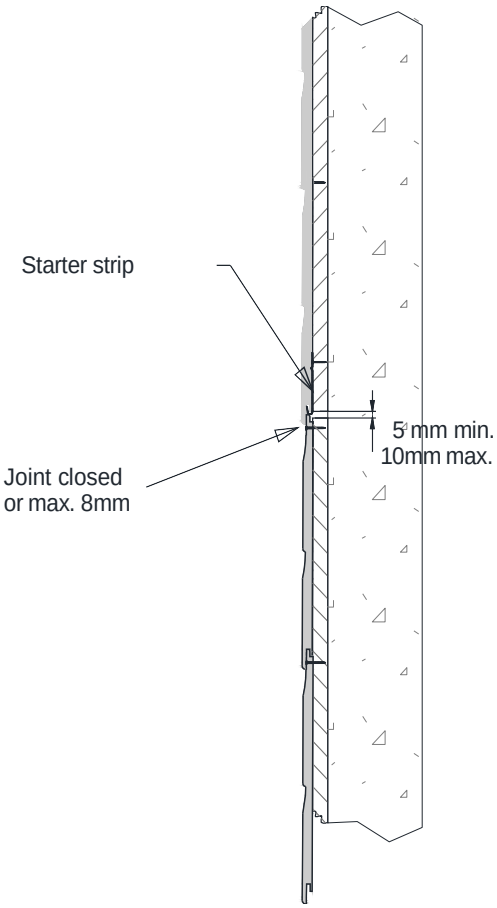



***Figure 15 – Division of framework ≤ 5.40 m in length – Direct installation***

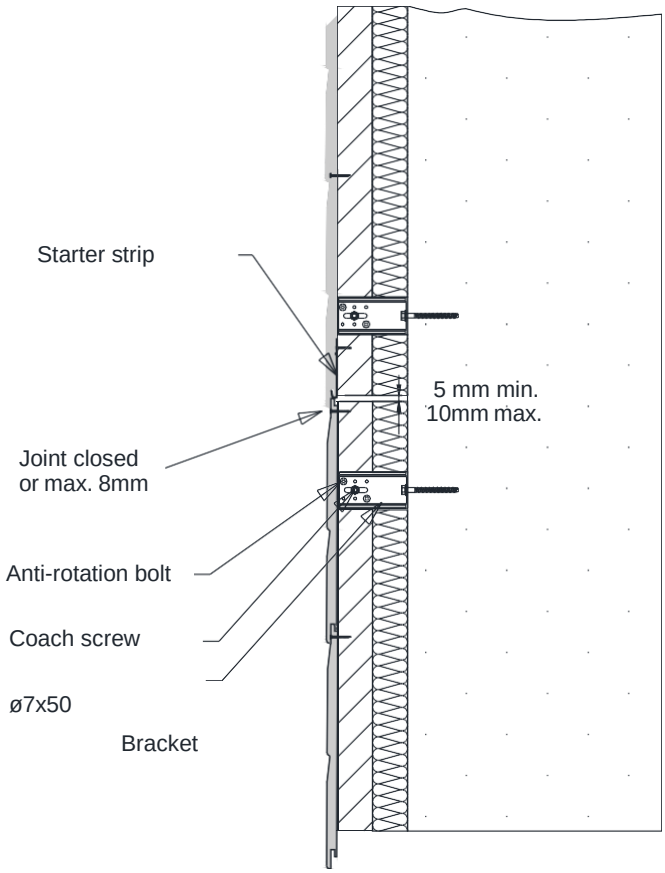



***Figure 15a – Separation of framework ≤ 5.40 m in length –Installation with boarding***

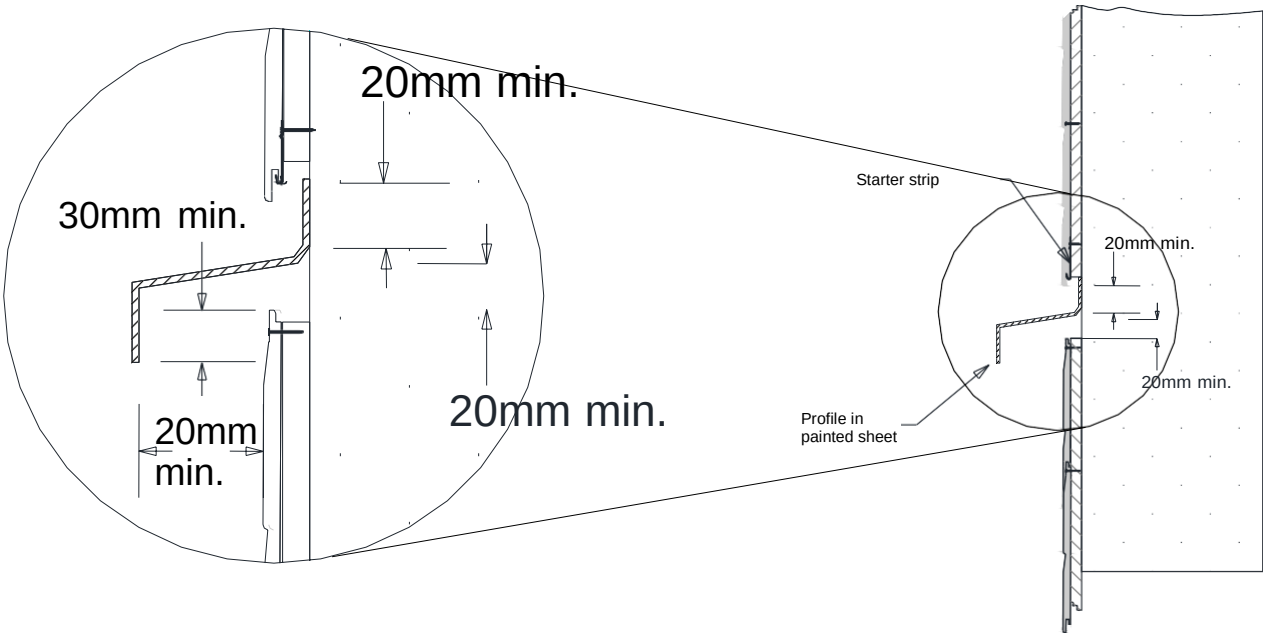



***Figure 16 – Separation of framework between 5.40 and 11 m in length – Direct installation***

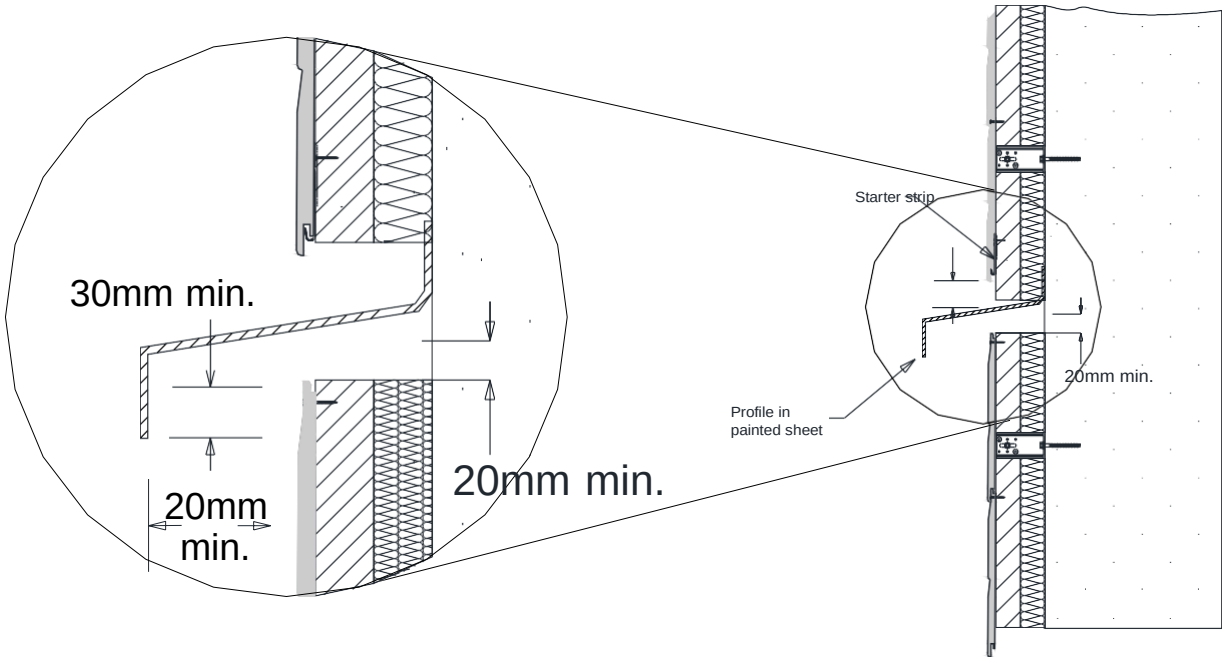



***Figure 16a – Separation of framework between 5.40 m and 11 m in length – Installation with boarding***

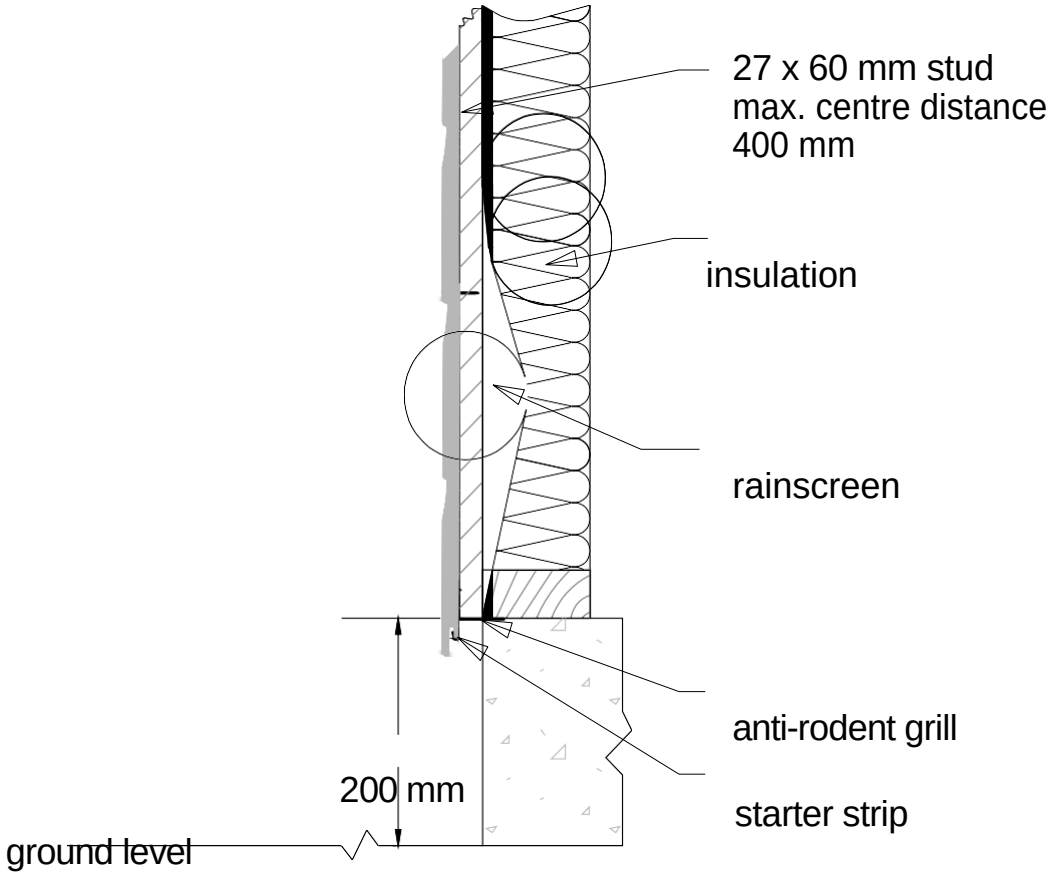



***Figure 17 – Vertical section on a TFB – Horizontal installation***

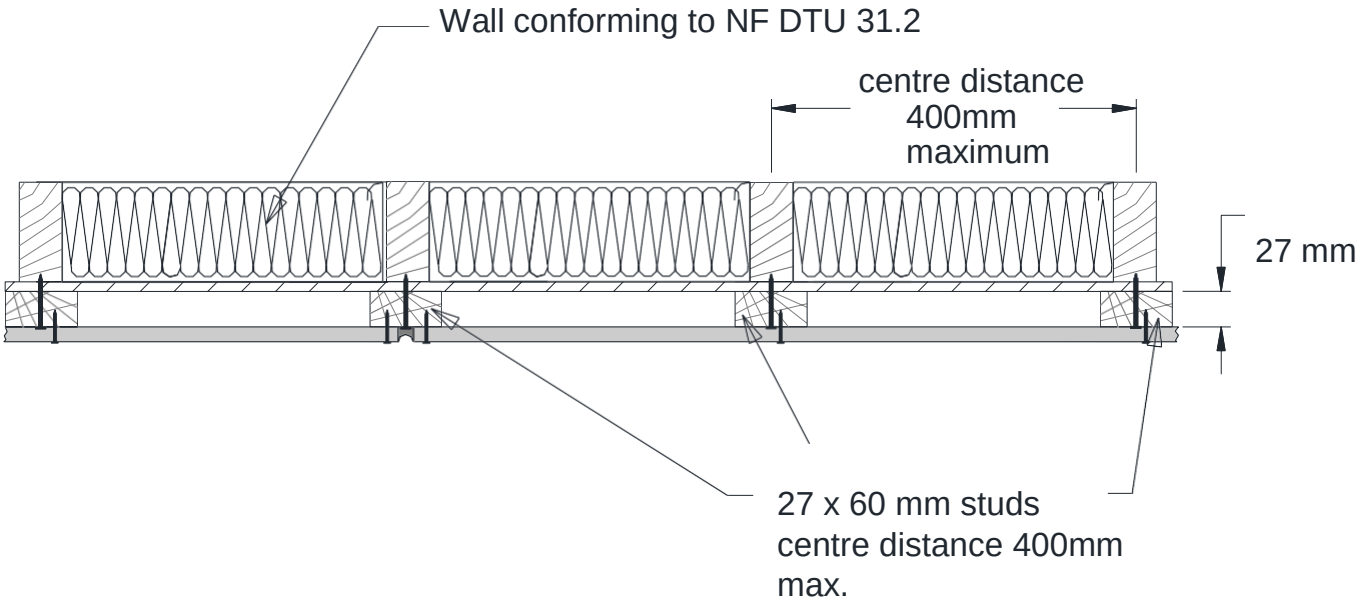



***Figure 18 – Horizontal section on a TFB – Horizontal installation (centre distance 400 mm max.)***

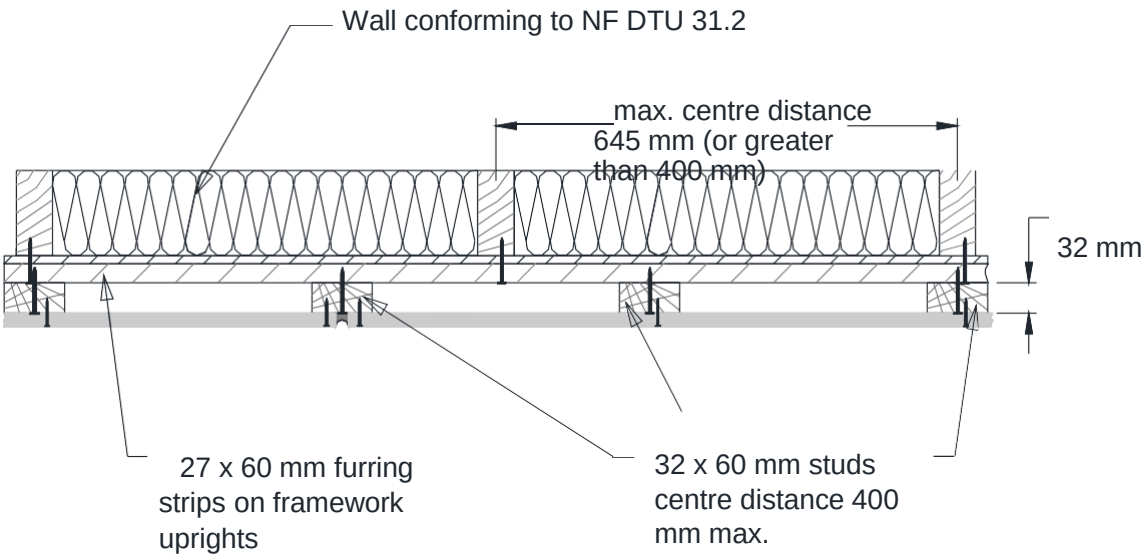



***Figure 19 – Horizontal section on a TSB – Horizontal installation (centre distance > 400 mm) – Installation on double studding***

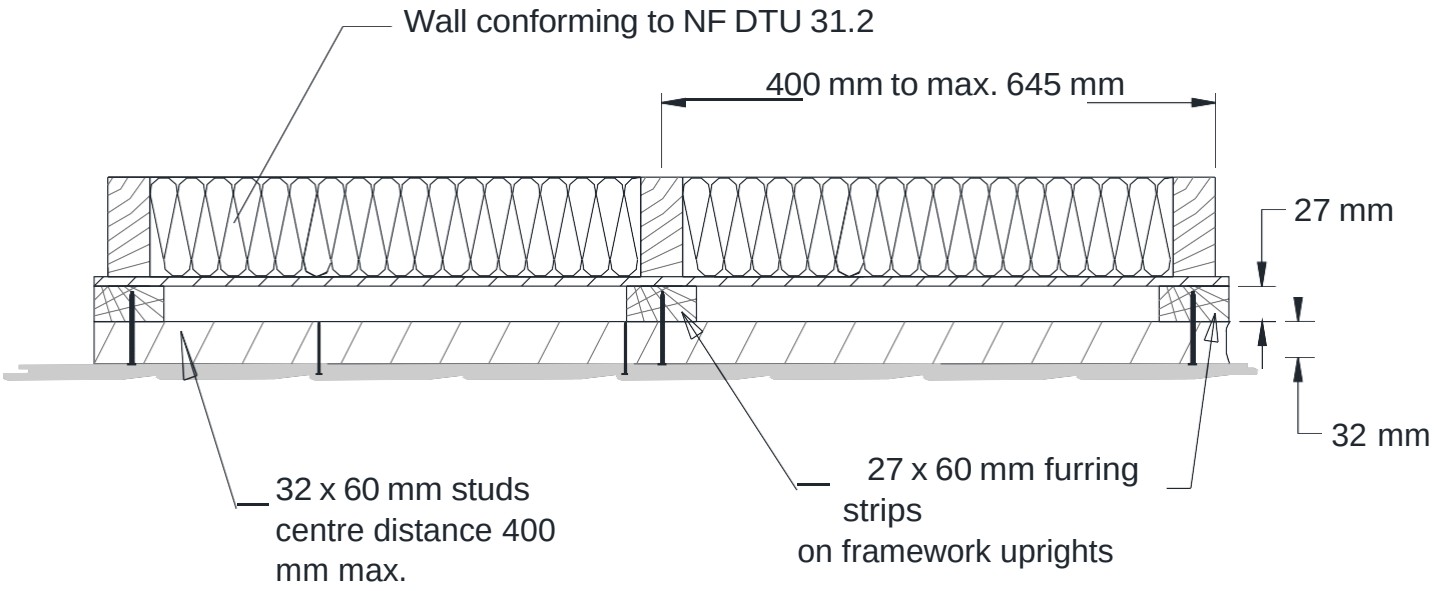



***Figure 20 – Horizontal section on a TFB – Vertical installation – installation on double studding***

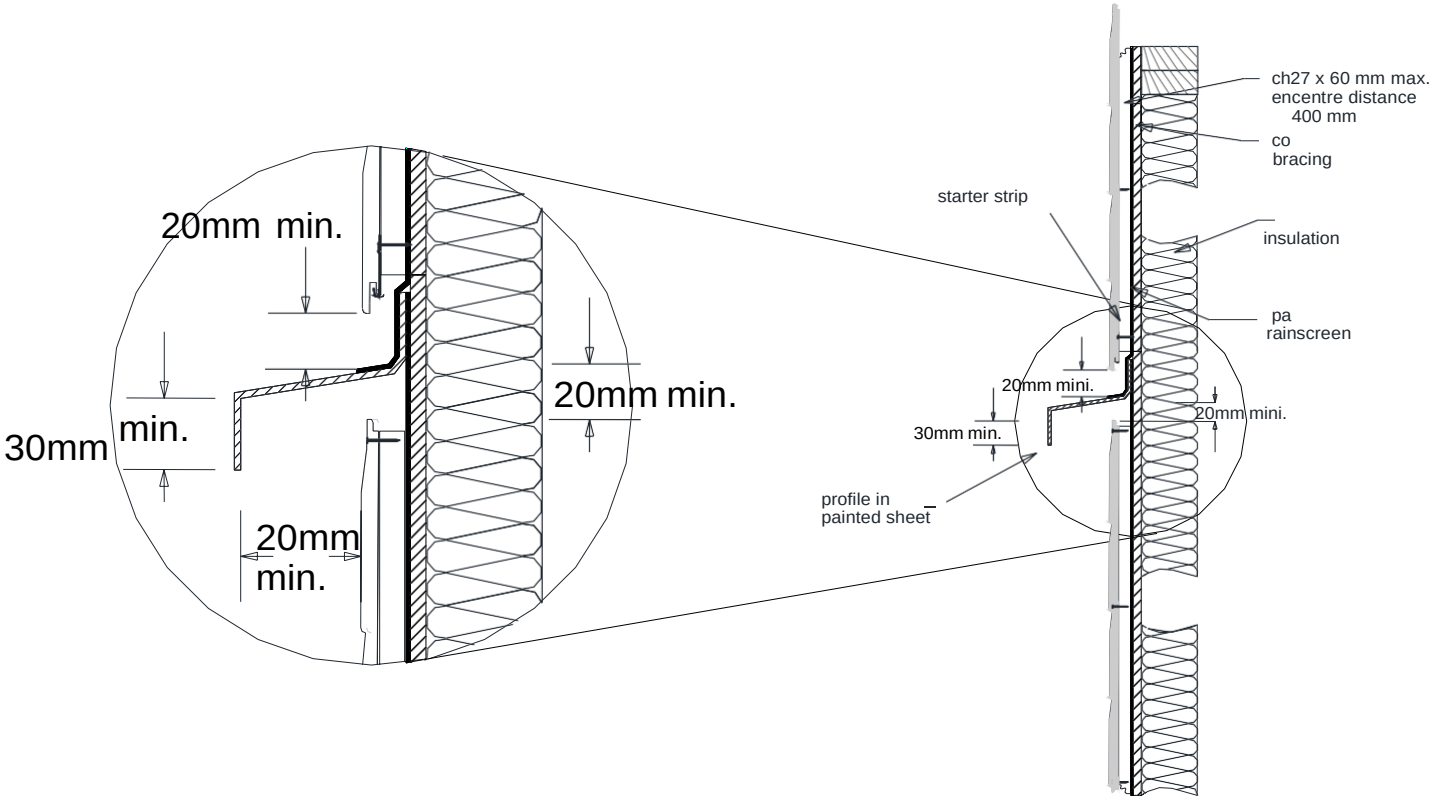



***Figure 21 – Overlapping of the rainscreen every 6 m on a TFB***

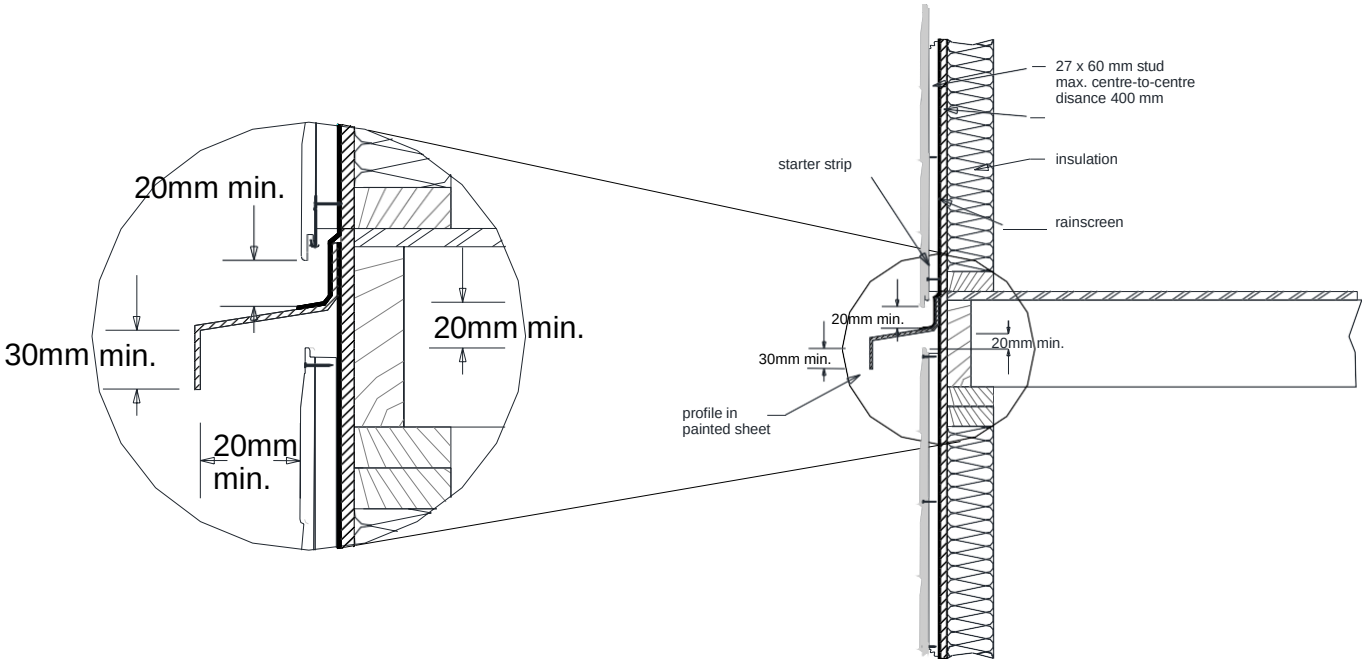



***Figure 22 – Separation of framework at each floor level on a TFB***