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Authorised and notified according to Article 10 of the Council Directive of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products (89/106/EEC)

Deutsches Institut für Bautechnik

DIBt

Mitglied der EOTA
Member of EOTA

European Technical Approval ETA-11/0105

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung *Trade name*		System Cocoon "Transformer"
Zulassungsinhaber *Holder of approval*		Häring Nepple AG Hebelstraße 75 4056 BASEL SCHWEIZ
Zulassungsgegenstand und Verwendungszweck *Generic type and use of construction product*		Bausatz für Gebäude aus Metallrahmen *Metal frame building kit*
Geltungsdauer: *Validity:*	vom *from* bis *to*	11 April 2011 11 April 2016
Herstellwerk *Manufacturing plant*		Häring Nepple AG Hebelstraße 75 4056 BASEL SCHWEIZ

Diese Zulassung umfasst *This Approval contains*	38 Seiten einschließlich 27 Anhänge *38 pages including 27 annexes*

I LEGAL BASES AND GENERAL CONDITIONS

1 This European technical approval is issued by Deutsches Institut für Bautechnik in accordance with:

- Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products[1], modified by Council Directive 93/68/EEC[2] and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council[3];
- Gesetz über das In-Verkehr-Bringen von und den freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998[4], as amended by law of 31 October 2006[5];
- Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC[6];
- Guideline for European technical approval of "Metal Frame Building Kits", ETAG 025.

2 Deutsches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European technical approval and for their fitness for the intended use remains with the holder of the European technical approval.

3 This European technical approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European technical approval.

4 This European technical approval may be withdrawn by Deutsches Institut für Bautechnik, in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.

5 Reproduction of this European technical approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Deutsches Institut für Bautechnik. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European technical approval.

6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

1 Official Journal of the European Communities L 40, 11 February 1989, p. 12
2 Official Journal of the European Communities L 220, 30 August 1993, p. 1
3 Official Journal of the European Union L 284, 31 October 2003, p. 25
4 *Bundesgesetzblatt Teil I 1998*, p. 812
5 *Bundesgesetzblatt Teil I 2006*, p. 2407, 2416
6 Official Journal of the European Communities L 17, 20 January 1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of the products and intended use

1.1 Definition of the construction products

The system Cocoon "Transformer" consists of industrially prefabricated load-bearing room-separating wall and floor elements which are brought to the site as assembled elements of varying completion rates and mounted there to a metal frame building (see Annex 1).

The wall and floor elements consist of thin-walled, cold-formed U- respectively C-formed profiles made of steel with a double-sided sheathing of wood-based boards or gypsum fibre boards.

The prefabricated wall and floor elements as well as examples for essential details of construction including their joints are shown in the Annexes to this European technical approval.

This European technical approval applies to predominantly static load only.

All building elements not specified in this European technical approval (e.g. cladding, roof covering, windows, doors, stairs, surface covering, service installations, complementary structures (including substructure, foundation), etc.), which are required for a finished construction works are not part of this European technical approval. This also applies to additional load-bearing components (e.g. beams or steel girders for concentrated loads/point loads) which are needed for each single construction works according to the static calculation.

1.2 Intended use

The system Cocoon "Transformer" is used for single-storey to at the most four-storey (ground floor and 3 upper floors) dwellings or buildings with comparable indoor climate and comparable use or for additions of stories on existing buildings (also for more than 4 entire floors). The intended use shall be assessed in the individual case depending on the climatic boundary conditions.

The provisions made in this European technical approval are based on an assumed working life of the system Cocoon "Transformer" of 50 years for the structure and for the not accessible building elements and materials, and 25 years for repairable or replaceable building components and building materials, provided that the conditions laid down in sections 4 and 5 are met. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

2 Characteristics of products and methods of verification

2.1 Characteristics of product

2.1.1 General

The dimensions, tolerances and material properties of the components which are not stated in the Annexes, shall be in accordance with the indication given in the technical documentation[7] to this European technical approval.

2.1.2 Dimensions

The dimensions of the components of the system Cocoon "Transformer" shall correspond to the indications given in the Annexes to this European technical approval.

2.1.3 Material properties

2.1.3.1 Profiles made of steel

For the manufacture of the wall and floor elements the cross-sections according to Annex 2 shall be used. The cross-sections shall be made from thin-walled, cold-formed U- respectively C-formed steel profiles S320GD+Z or DX51D+Z275 according to EN 10346:2009 with the following minimum values:

Yield strength: f_y = 320 N/mm^2

Tensile strength: R_m = 390 N/mm^2

Ultimate elongation: A_{80} = 17 %

2.1.3.2 Sheathing

For the sheathing of wall and floor elements the products according to Annex 26, Table 26.1 may be used.

2.1.3.3 Fasteners

As fasteners screws and nails shall be used that are in accordance with indications given in Annexes 8 and 9 and in the technical documentation[7] to this European technical approval.

2.1.3.4 Angle brackets and bracing elements

The angle brackets and bracing elements according to Annex 3 shall be made of thin-walled, cold-formed steel profiles S250GD+Z according to EN 10346:2009 with the following minimum values:

Yield strength: f_y = 250 N/mm^2

Tensile strength: R_m = 330 N/mm^2

Ultimate elongation: A_{80} = 19 %

2.1.3.5 Hat ceiling profiles/hat spring rails

The hat ceiling profiles/hat spring rails according to Annex 5 shall be made of galvanized steel sheet according to EN 10346:2009 with a minimum thickness of sheet of 0,6 mm and taking into account the indications of the technical documentation[7] to this European technical approval.

2.1.3.6 Insulation material, steam brake/air tightness

As insulation material mineral wool according to EN 13162:2008 is used. The thickness depends on the requirements concerning the building physics applicable to the structure.

As steam brake/air tightness PE foil according to EN 13984:2004+A1:2006 is used according to the requirements concerning the building physics applicable to the structure.

[7] The technical documentation of this ETA is deposited with DIBt and, as far as this is important for the tasks of the body involved in the procedure of attestation of conformity, shall be handed over to the approved bodies.

2.1.4 Characteristic values and design values of resistance

The characteristic values of cross-section and load-bearing capacity of the wall and lintel profiles as well as the floor profiles are given in Annexes 22 and 23. The verifications required for wall and floor profiles are listed in Annex 21.

The design values of the wall and floor profiles result from the division by the partial safety factor γ_{M1}. As partial safety factor γ_{M1} the value 1.1 is recommended. It should be used provided the value is not stated in the national provisions of the Member State where the system Cocoon "Transformer" will be used and/or in the National Annex to Eurocode 3.

For the design value of load-bearing capacity of the connection sheathing - steel profile $f_{p,Rd}$ the following applies:

$$f_{p,Rd} = \frac{F_{f,Rk} \cdot k_{mod}}{a_v \cdot \gamma_M}$$

Where:

$F_{f,Rk}$: Characteristic value of load-bearing capacity per shear joint and fastener in [N]

$F_{f,Rk}$ for ballistic nails according to Annex 26, Table 26.2

$F_{f,Rk}$ for screws according to Annex 27, Table 27.1

a_v: Spacing between fasteners along the perimeter of each panel in [mm]

k_{mod}: Modification factor according to EN 1995-1-1:2004+A1:2008[8]

γ_M: Partial safety factor. As partial safety factor γ_M the value 1.3 is recommended. It should be used provided the values are not stated in the national provisions of the Member State where the system Cocoon "Transformer" will be used and/or in National Annex to the Eurocode 5.

2.1.5 Safety in case of fire

The steel profiles according to section 2.1.3.1 as well as the fastening elements according to section 2.1.3.3 and the elements according to section 2.1.3.4 and 2.1.3.5 satisfy the requirements of Class A1 of the reaction-to-fire performance appropriate to EN 13501-1:2007.

The resin-bonded chipboards as well as the OSB-boards according to section 2.1.3.2 satisfy the requirements of Class D-s2, d0 of the reaction-to-fire performance appropriate to EN 13501-1:2007.

The cement-bonded chipboards according to section 2.1.3.2 satisfy the requirements of Class B-s1, d0 of the reaction-to-fire performance appropriate to EN 13501-1:2007.

The gypsum fibre boards according to section 2.1.3.2 satisfy the requirements of Class A2-s1, d0 respectively A1 of the reaction-to-fire performance appropriate to EN 13501-1:2007.

The mineral wool according to section 2.1.3.6 satisfies the requirement of Class A1 of the reaction-to-fire performance appropriate to EN 13501-1:2007.

The steam brake/air tightness according to section 2.1.3.6 satisfies the requirement of Class E of the reaction-to-fire performance appropriate to EN 13501-1:2007.

2.1.6 Corrosion protection

The provisions given in EN ISO 12944:1998[8] respectively EN 10346:2009, EN 1090-2:2008[8] and EN 1995-1-1:2004+A1:2008[8] apply.

[8] In addition the corresponding National Annex and/or the national provisions of the Member State applicable for the location where the product is incorporated in the works shall be taken into account.

2.2 Methods of verification

2.2.1 General

The assessment of the fitness of the system Cocoon "Transformer" for the intended use with regard to the essential requirements has been made in accordance with ETAG 025 (version May 2006).

2.2.2 Essential Requirement No 1: Mechanical resistance and stability

The characteristic values of resistance of the wall, lintel and floor profiles have been determined by calculation following EN 1993-1-3:2007.

The characteristic values of resistance of the screws according to Annex 26 have been determined by calculation following EN 1995-1-1:2004+A1:2008.

The characteristic values of resistance of the ballistic nails according to Annex 27 have been determined by calculation following EN 1995-1-1:2004+A1:2008, supported by tests.

The verification of the floor diaphragms according to Annexes 24 and 25 is based on the regulations given in EN 1995-1-1:2004+A1:2008.

No performance is determined for seismic action.

2.2.3 Essential requirement No 2: Safety in case of fire

Reaction to fire

The steel profiles according to section 2.1.3.1 as well as the fasteners according to section 2.1.3.3 and the elements according to section 2.1.3.4 and 2.1.3.5 satisfy the requirements of Class A1 of the reaction-to-fire performance in accordance with the provisions of Commission Decision 96/603/EC (as amended) without the need for testing on the basis of its listing in that Decision.

The resin-bonded chipboards and OSB-boards according to section 2.1.3.2 satisfy the requirements of Class D-s2, d0 of the reaction-to-fire performance appropriate to EN 13501-1:2007 in accordance with EN 13986, Table 8.

The cement-bonded chipboards according to section 2.1.3.2 satisfy the requirements of Class B-s1, d0 of the reaction-to-fire performance appropriate to EN 13501-1:2007 in accordance with EN 13986, Table 8.

The gypsum fibre boards according to section 2.1.3.2 satisfy the requirements of Class A2-s1, d0 respectively A1 appropriate to EN 13501-1:2007 in accordance with ETA-03/0050, ETA-08/0147 respectively ETA-07/0086.

The mineral wool according to section 2.1.3.6 satisfies the requirement of Class A1 of the reaction-to-fire performance in accordance with the provisions of Commission Decision 96/603/EC (as amended) without the need for testing on the basis of its listing in that Decision.

Resistance to fire, external fire performance of the roof covering, fire compartmentation

No performance determined.

2.2.4 Essential requirement No 3: Hygiene, health and the environment

Vapour permeability and moisture resistance, watertightness

No performance determined.

Release of dangerous substances

The manufacturer has presented a confirmation that substances classified as dangerous according to Council Directive 67/548/EEC, the CLP Regulation (EC) No 1272/2008 as well as the “Indicative list of dangerous substances“ of the EGDS are not contained in the kit (system Cocoon "Transformer"). Other substances that could be dangerous for users and the environment taking into account the installation conditions as well are not contained in the kit.

Note: In addition to the specific clauses relating to dangerous substances contained in this European technical approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.

2.2.5 Essential requirement No 4: Safety in use

No performance determined.

2.2.6 Essential requirement No 5: Protection against noise

No performance determined.

2.2.7 Essential requirement No 6: Energy economy and heat retention

No performance determined.

2.3 Durability, serviceability and Identification

2.3.1 Aspects of durability

Durability of the kit is acceptable in relation to the intended use and performance related to Essential Requirements 1, 2 and 3.

For the corrosion protection EN ISO 12944:1998[8] respectively EN 10346:2009 applies. In addition, EN 1090-2:2008[8] and EN 1995-1-1:2004+A1:2008[8] shall be taken into account.

Concerning the wood-based boards EN 1995-1-1:2004+A1:2008[8] respectively EN 13968 shall apply, as far as the gypsum fibre boards are concerned the relevant European technical approval shall apply.

2.3.2 Aspects of serviceability

For the serviceability of the kit shall be ensured that suspended floors have sufficient stiffness to avoid unacceptable vibrations through normal use. The deflections of the wall and floor elements shall be limited in accordance with the requirements of the Member States.

2.3.3 Identification

The kit is identified with the CE marking in accordance with chapter 3.3. All individual components are described and identified in section 2.

3 Evaluation and attestation of conformity and CE marking

3.1 System of attestation of conformity

According to the Decision 2003/728/EC of the European Commission[9] system 1 of the attestation of conformity applies.

This system of attestation of conformity is defined as follows:

System 1: Certification of the conformity of the product by an approved certification body on the basis of:

(a) Tasks for the manufacturer:
  (1) factory production control;
  (2) further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan;

(b) Tasks for the approved body:
  (3) initial type-testing of the product;
  (4) initial inspection of factory and of factory production control;

[9] Official Journal of the European Union L 262/34 of 14.10.2003

(5) continuous surveillance, assessment and approval of factory production control.

Note: Approved bodies are also referred to as "notified bodies".

3.2 Responsibilities

3.2.1 Tasks for the manufacturer

3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European technical approval.

The manufacturer may only use components stated in the technical documentation of this European technical approval.

The factory production control shall be in accordance with the "Control plan of 11 April 2011 relating to the European technical approval ETA-11/0105 issued on 11 April 2011" which is part of the technical documentation of this European technical approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited with Deutsches Institut für Bautechnik.[10]

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

3.2.1.2 Other tasks for the manufacturer

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of "Metal frame building kit" in order to undertake the actions laid down in section 3.2.2. For this purpose, the control plan referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body.

3.2.2 Tasks for the approved bodies

The approved body shall perform the

- initial type-testing of the product,
- initial inspection of factory and factory production control,
- continuous surveillance, assessment and approval of factory production control

in accordance with the provisions laid down in the control plan.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the product stating the conformity with the provisions of this European technical approval.

In cases where the provisions of the European technical approval and its control plan are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform Deutsches Institut für Bautechnik without delay.

[10] The control plan is a confidential part of the European technical approval and only handed over to the approved body involved in the procedure of attestation of conformity. See section 3.2.2.

3.3 CE marking

The CE marking shall be affixed on the product itself, on the packaging, on the delivery note of the kit or on the accompanying commercial documents, e.g. EC declaration of conformity. The letters "CE" shall be followed by the identification number of the approved certification body and be accompanied by the following additional information:

- Identification number of approved certification body,
- the name and address of the producer (legal entity responsible for the manufacture),
- indications for the intended use,
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate of conformity for the kit,
- the number of the European technical approval,
- trade name of the kit,
- Indication of dangerous substances.

4 Assumptions under which the fitness of the products for the intended use was favourably assessed

4.1 Local building regulations

A specification of relevant requirements concerning structural design, fire resistance and reaction to fire, sound insulation performance, thermal insulation performance and ventilation provisions shall be elaborated for each delivery as a basis for the production and dimensioning of a kit.

The design process (including the approval of detailed plans, applications for planning permissions, building permits, etc.) shall comply with the procedures foreseen in the Member States in which the building is to be built. A European technical approval for a metal frame building kit does not amend this process in any way.

4.2 Manufacturing

The manufacture of each kit shall be carried out on the basis of a specific structural design for the construction works and according to this European technical approval. The structural design shall comply with the requirements and provisions applicable in the Member States where the building is to be erected.

The European technical approval is issued for the kit on the basis of agreed data and information, deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data and information being incorrect, shall be notified to Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the approval and consequently the validity of the CE marking on the basis of the approval and if so whether further assessment or alterations to the approval shall be necessary.

4.3 Conceptual design

Each building is designed in accordance with the requirements of this European technical approval and the requirements and provisions applicable in the Member States where the building is to be erected.

The columns of the building elements of the external wall respectively ceiling joists are arranged in a grid of a maximum of 62.5 cm.

The butt joints of the sheathing are arranged exclusively on the steel profiles.

Examples for the execution of detail areas are presented in Annexes 10 to 20.

4.4 Structural design

Unless otherwise specified in the European technical approval, the verification of the load-bearing capacity and the serviceability of the system Cocoon "Transformer" (individual load-bearing components as well as the entire building) is verified in each single case on the basis of a structural design according to the requirements applicable in the Member States where the building is to be erected.

For the verification of the ultimate limit state the safety concept according to EN 1990:2002 is used.

The necessary verifications of the load-bearing capacity of the wall, lintel and floor profiles, fasteners, floor and wall diaphragms are carried out in accordance with EN 1993-1-1:2005[8], EN 1993-1-3:2006[8] and EN 1995-1-1:2004+A1:2008[8], taking into account the indications of this European technical approval.

The deflections of the wall and floor elements are limited in accordance with the appropriate provisions of the Member States.

The loads are predominantly static.

The dimensions and material properties which are declared in this European technical approval are observed.

The rules relating to corrosion protection given in EN 1090-2:2008[8] and EN ISO 12944:1998[8] respectively EN 10346:2009 as well as EN 1995-1-1:2004+A1:2008[8] are taken into account.

Furthermore, the rules relating to durability given in EN 1995-1-1:2004+A1:2008[8] as well as EN 13986 are taken into account.

The verification of ultimate limit state is carried out by a structural engineer experienced in the field of steel and timber construction.

4.5 Substructure

This European technical approval does not include the substructure of a building. The tolerances of the substructure´s surface are ± 5 mm. More indications to the dimensions, if necessary and the presentation of details (e.g. protective measures against ascending humidity etc.) for the manufacture of the substructure will be delivered by the manufacturer of the kit. The substructure shall be designed and carried out according to the requirements and provisions applicable in the Member States in which the construction work shall be erected. It shall be stable and capable to carry and to transmit the loads of the elements of the system Cocoon "Transformer".

With regard to the requirements for anchorage of the building elements of the external wall with the foundation or the substructure the provisions that apply in the Member States shall be respected accordingly.

4.6 Execution of works

The execution of works is carried out exclusively following the indications of the manufacturer by assembly personnel having undergone relevant instruction by specialists of firms experienced in this field. The manufacturer hands the assembling instructions that covers all important aspects related to the site work over to the executing company. It is indicated in the assembling instructions that all building elements of the system Cocoon "Transformer" have to be checked before installation for perfect quality and that damaged building elements may not be used.

The requirements in EN 1090-2:2008[8] are taken into account where relevant.

The compatibility of the completed building with the provisions of the European technical approval shall be confirmed by the executing company.

The completed building (the construction works) shall comply with the building regulations applicable in the Member States where the building is to be constructed.

4.7 Packaging, transport and storage

The instructions of the manufacturer shall be taken into account.

During transport and storage the wall and floor elements have to be protected from mechanical damage and detrimental moisture, e.g. from precipitations or moisture.

4.8 Use, maintenance, repair

Damaged building elements or components of the kit may not be used or installed. Damaged building elements or components shall be immediately exchanged and replaced by perfect ones.

With regard to the assumed working life a regular maintenance is required. The manufacturer shall add written documents to the kit which contain descriptions about type and frequency of the maintenance.

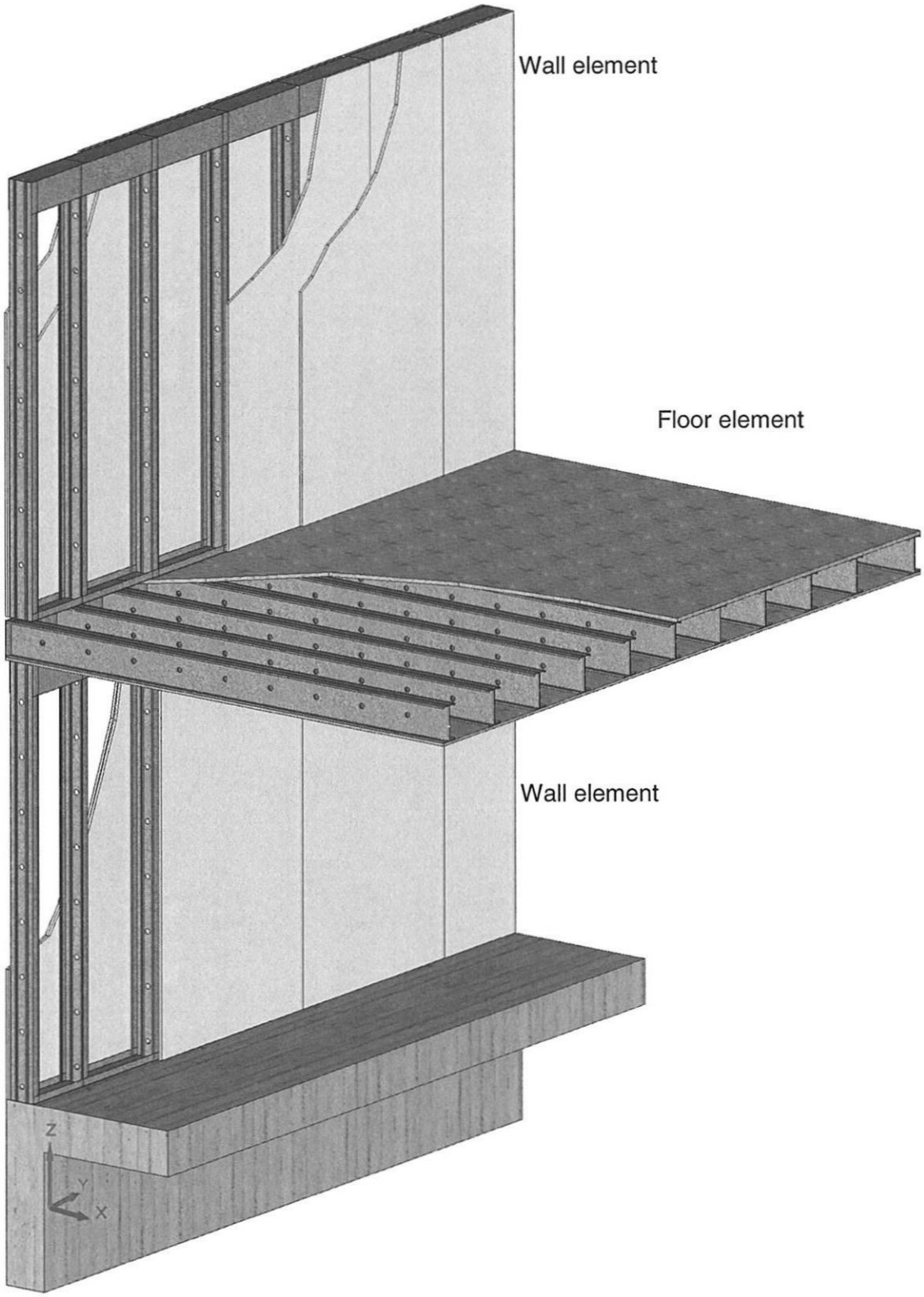
5 Indications to the manufacturer

The manufacturer shall ensure that the information on the specific conditions according to sections 1, 2 and 4 (including the Annexes referred to) is given to those who are concerned. This information may be given by reproduction of the European technical approval.

In addition, all essential installation data shall be shown clearly on the package and/or on an enclosed instruction sheet, preferably using illustration(s).

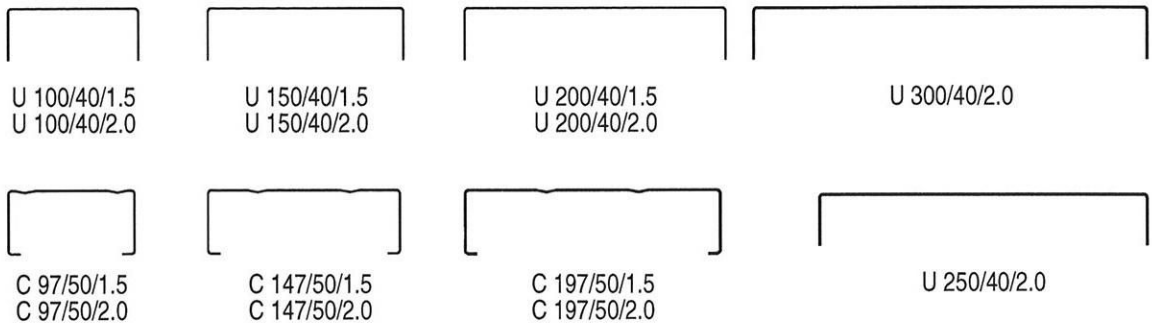
Georg Feistel
Head of Department

beglaubigt
Spohn

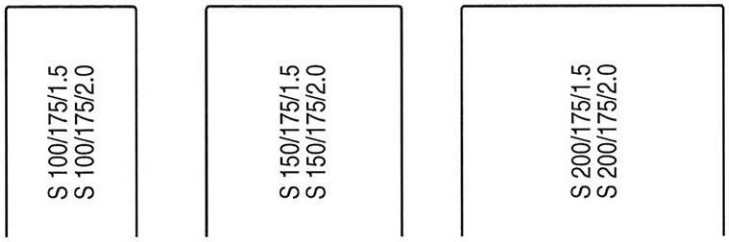


Macht das Projekt leichter.	**Annex 1**
System Cocoon „Transformer“, example	to European Technical Approval **ETA-11/0105**

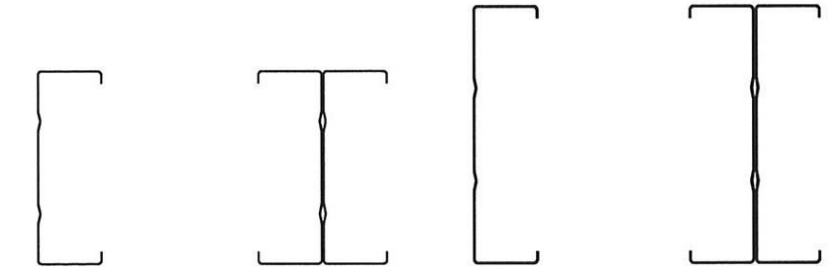
Wall profiles Cocoon Transformer

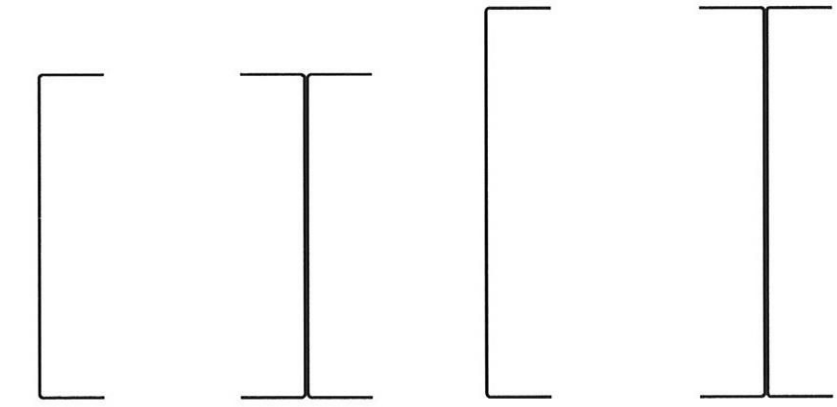


Lintel profiles Cocoon Transformer



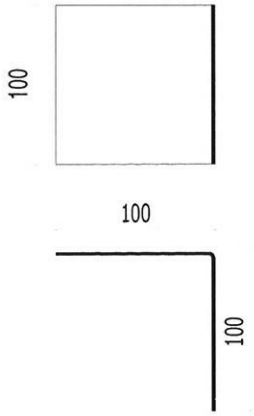
Floor profiles Cocoon Transformer





Macht das Projekt leichter.	**Annex 2** to European Technical Approval **ETA-11/0105**
Cross sections of profiles Cocoon Transformer	

Angle brackets



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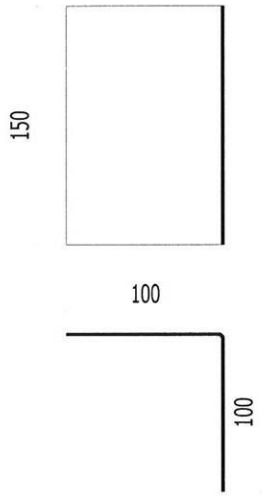

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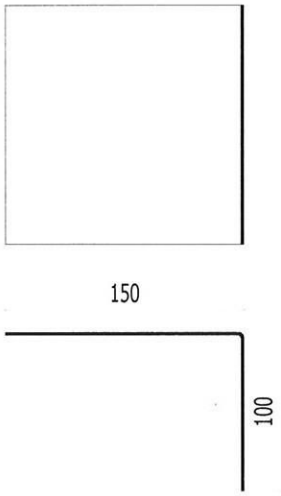

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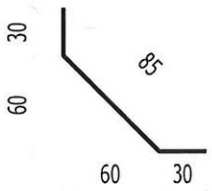
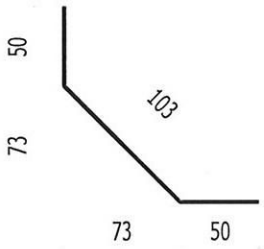
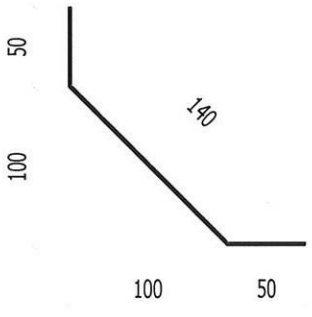
Bracing elements



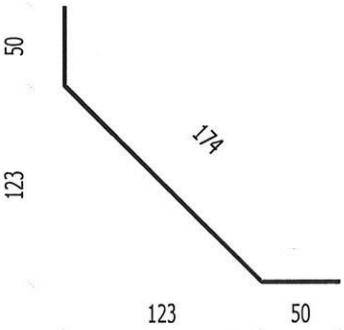
Bracing element 30/85/30x5.0



Bracing element 50/103/50x5.0



Bracing element 50/140/50x5.0



Bracing element 50/174/50x5.0

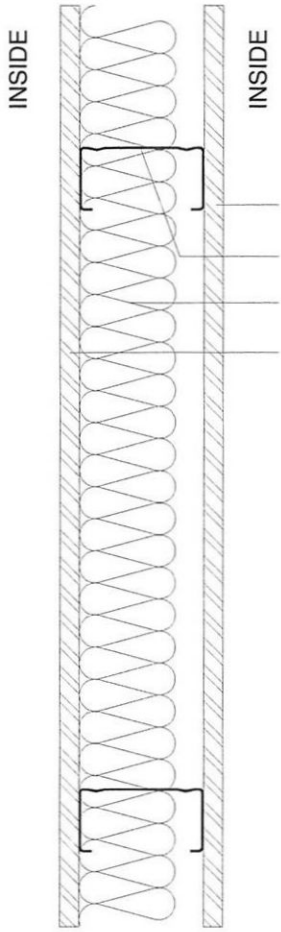
Dimensions in [mm]

Macht das Projekt leichter.	**Annex 3** to European Technical Approval **ETA-11/0105**
Angle brackets and bracing elements	

Assembly of wall elements

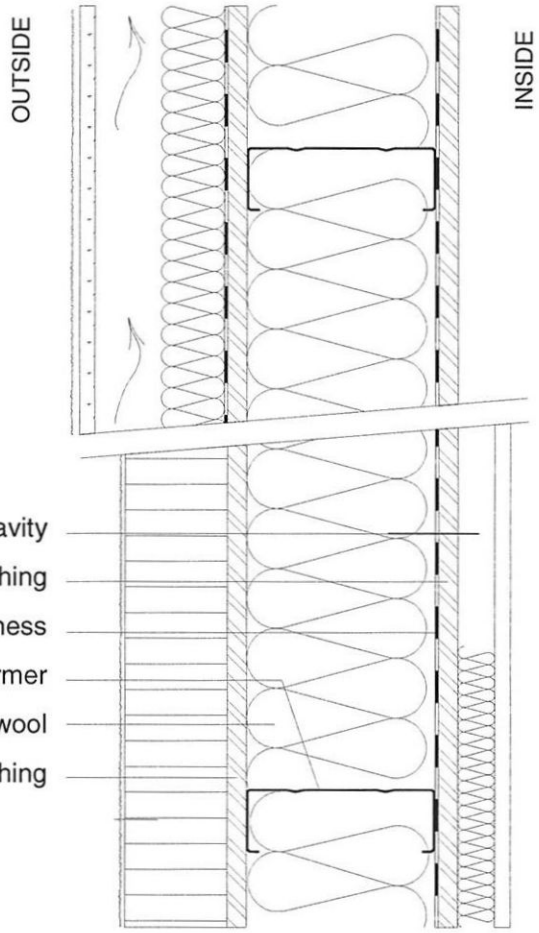
Interior wall

horizontal section



Exterior wall

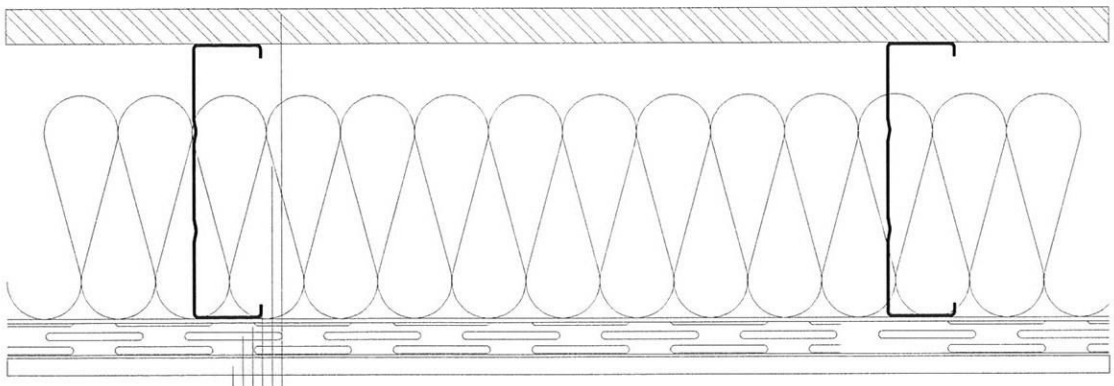
horizontal section



The configuration and the choice of sheathing materials depend on the static and building-physics requirements of the structural element.

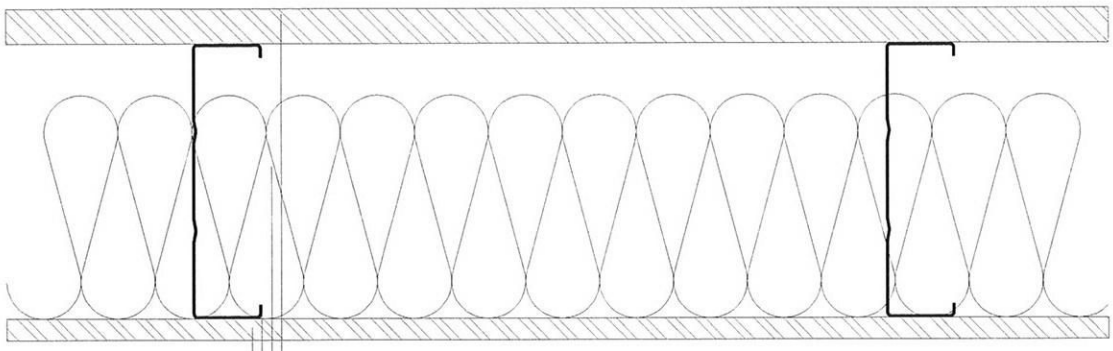
Assembly of floor elements

Vertical section



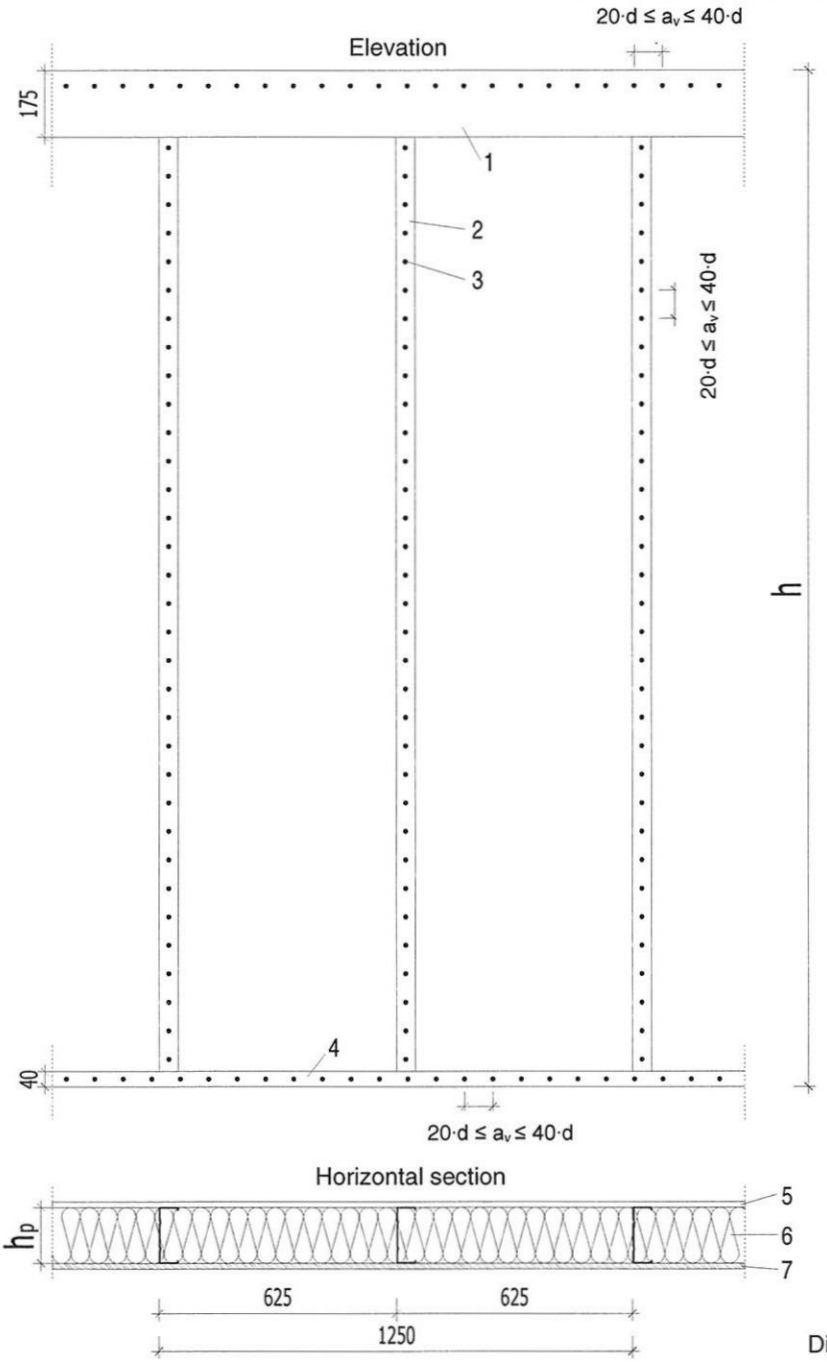
Upper sheathing
Mineral wool
Floor profile Cocoon Transformer (single or double profile)
Service cavity
Hat ceiling profile / hat spring rail according to section 2.1.3.5
Gypsum fiber board

Vertical section



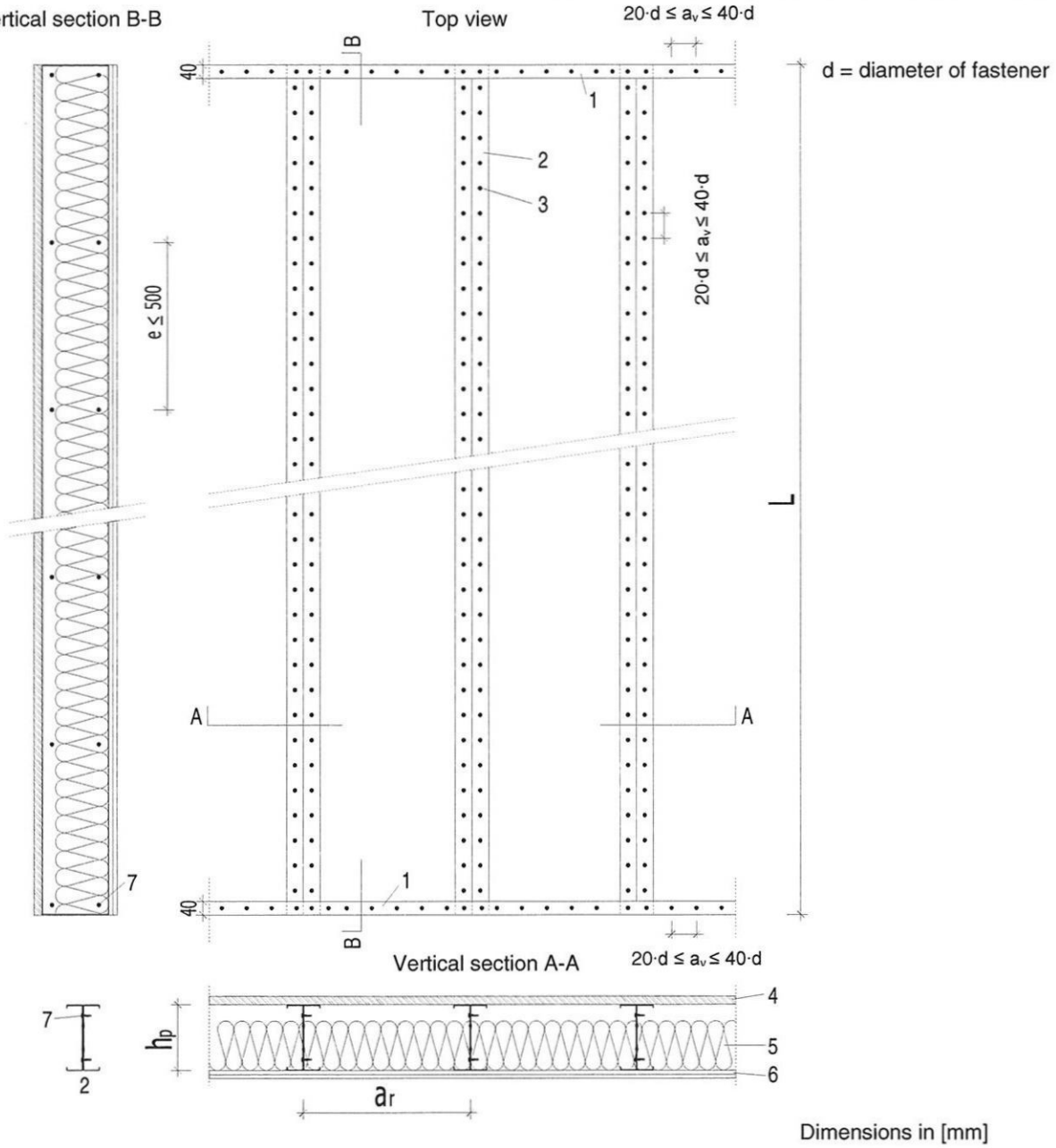
Upper sheathing
Mineral wool
Floor profile Cocoon Transformer (single or double profile)
Lower sheathing

The configuration and the choice of sheathing materials depend on the static and building-physics requirements of the structural element.



1 Lintel U-profile according to Annex 2
2 Wall profile according to Annex 2
3 Screws or ballistic nails according to Annex 8. In case of walls used as diaphragm, the requirements concerning fastener distances according to Annex 26, Table 26.3 or Annex 27, Table 27.2 shall be considered.
4 U-profile (analogous wall profile according to Annex 2)
5 Sheathing panel. Material, minimum thickness and building material category according to Annex 26
6 Mineral wool
7 Sheathing panel. Material, minimum thickness and building material category according to Annex 26

Macht das Projekt leichter.	**Annex 6** to European Technical Approval **ETA-11/0105**
Execution of wall elements	



Dimensions in [mm]

1 U-profile (analogous floor profile according to Annex 2)
2 Floor profile according to Annex 2
3 Screws or ballistic nails according to Annex 8. In case of floors used as diaphragm, the requirements concerning fastener distances according to Annex 26, Table 26.3 or Annex 27, Table 27.2 shall be considered.
4 Load-bearing sheathing. Material, minimum thickness and building material category according to Annex 26
5 Mineral wool
6 Suspended ceiling, e.g. gypsum fiber board on substructure made of metal or direct on floor profile. Characteristics depend on building-physics requirements
7 Connection of floor profiles e<500 mm. Edge distances according to Annex 9.

Macht das Projekt leichter.	**Annex 7** to European Technical Approval **ETA-11/0105**
Execution of floor elements	

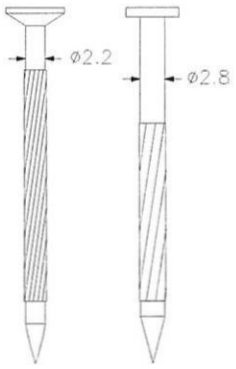
Drywall self drilling screw

Type:	Countersunk head, self-tapping screw thread, self-drilling tip for steel sheets of 0.70mm to 2.25mm according to technical documentation
Corrosion protection:	Phosphatising
Application:	Fastening of gypsum fibre boards on substructure made of steel

Self-drilling screw

Type:	Self-tapping screw thread, self-drilling tip for steel sheets of 1.5mm to 5mm according to technical documentation
Corrosion protection:	Galvanizing
Application:	Fastening of chip boards on substructure made of steel

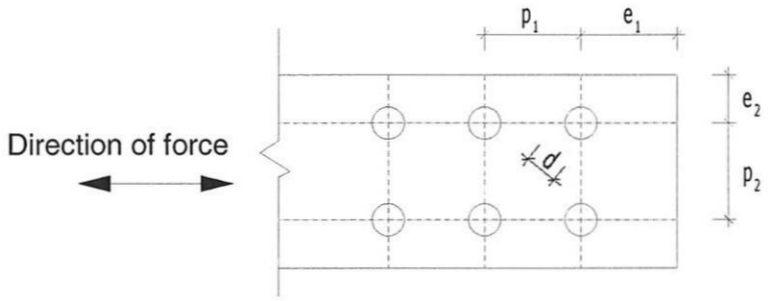
Ballistic nail ITW



Type:	According to technical documentation
Corrosion protection:	Zinc-plated
Application:	Fastening of chip and gypsum boards on thin-walled steel profiles

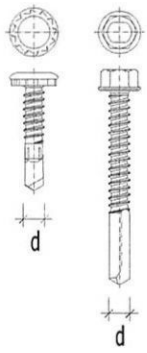
Minimum distances perpendicular to the edge of the sheathing according to Annex 26, Table 26.3 or Annex 27, Table 27.2

Edge distances and interspaces of fasteners according to EN 1993-1-3



$e_1 > 3d$ $\quad p_1 > 3d$ $\quad d$ = nominal diameter of fastener

$e_2 > 1.5\ d$ $\quad p_2 > 3d$

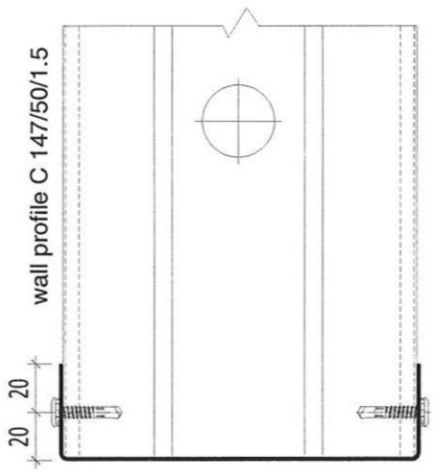


Fasteners with European technical approval

Web joints

Dimensions in [mm]

Joint wall profile to bottom sill

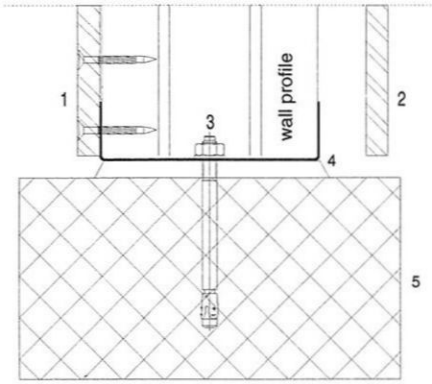


Sill U 150/40/1.5

Macht das Projekt leichter.	**Annex 9** to European Technical Approval **ETA-11/0105**
Connection of steel profiles to each other	

Continuous anchorage of sill profile to foundation

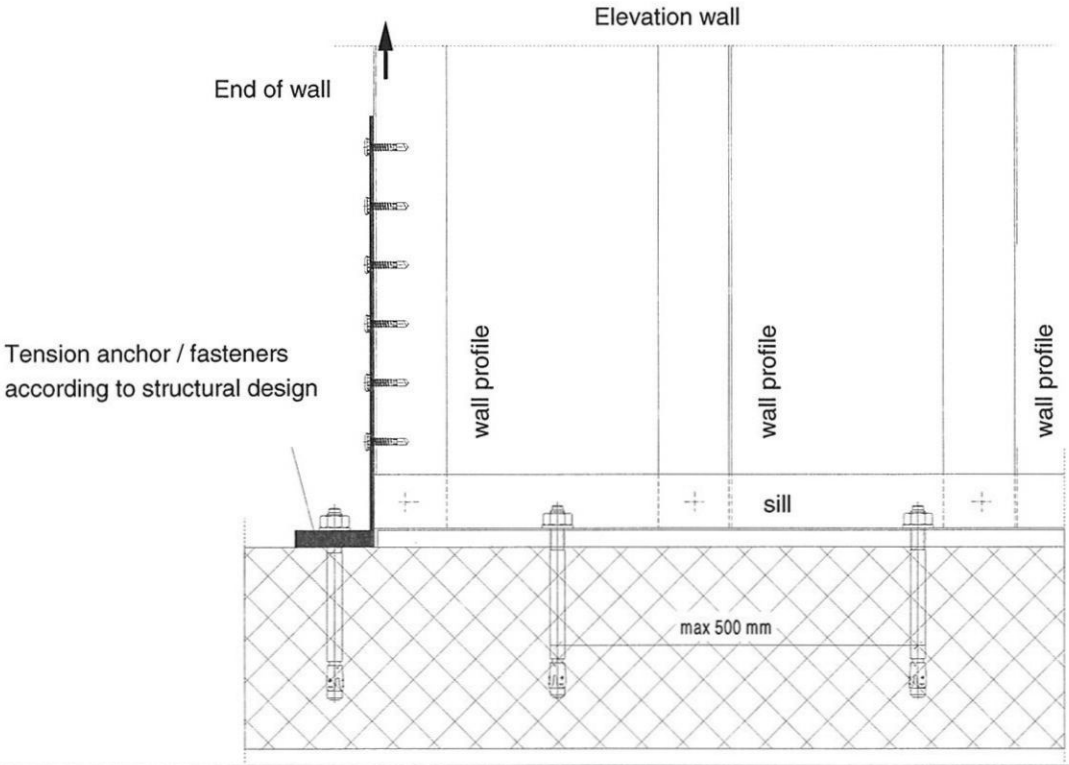
Vertical section



1 Factory-mounted panel (bracing sheathing)
2 Sheathing will be fixed at the building site after anchorage of wall
3 Anchor bolt according to structural design, maximum spacing to each other 500 mm
4 Force-fit shimming of sill e.g. using swelling mortar
5 Foundation

Tension anchor of wall diaphragms

Tension anchor in wall section. Tension plate of anchor is bolted together with the profile's web.
Tension anchor and number of fasteners according to structural design.



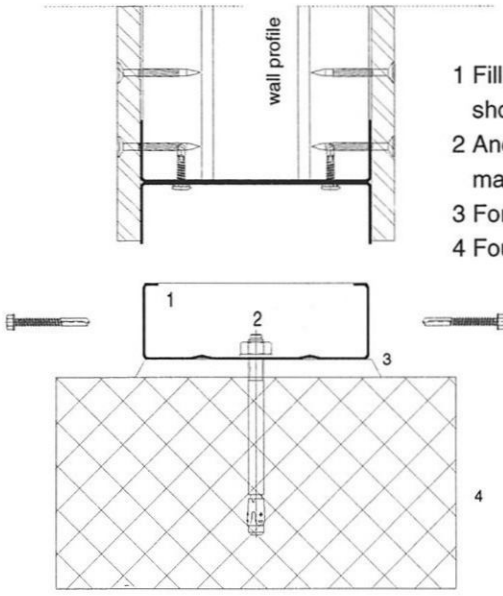
Fasteners sheathing, screwed joint of Cocoon profiles, insulation, steam brake, etc. not shown for reasons of simplification

Macht das Projekt leichter.	**Annex 10** to European Technical Approval **ETA-11/0105**
Anchoring of factory-open or semi-open wall diaphragms	

Continuous anchorage of sill profile to foundation

Option compound-filled sill

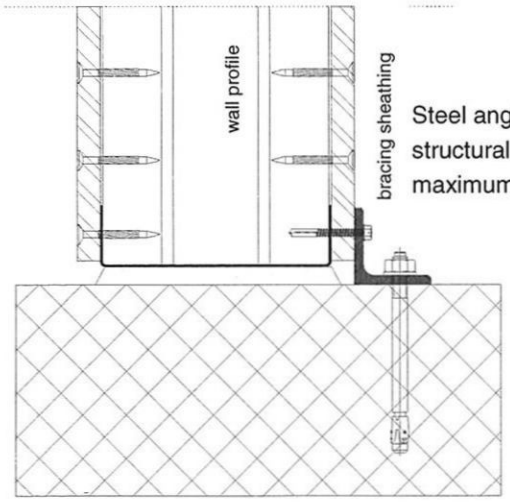
Vertical section



1 Filling with cement-bound, shrink-free grout shortly before erection of the wall!
2 Anchor bolt according to structural design, maximum spacing to each other 500 mm
3 Force-fit shimming of sill e.g. using swelling mortar
4 Foundation

Option steel angle bracket

Vertical section

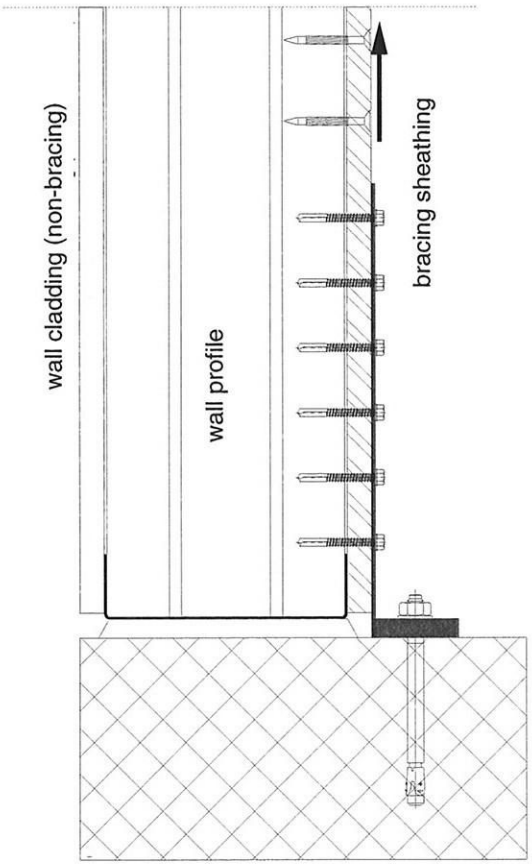


Steel angle bracket/ anchor bolt according to structural design,
maximum spacing to each other 500 mm

Fasteners sheathing, screw joint of Cocoon profiles, insulation, steam brake, etc. not shown for reasons of simplification

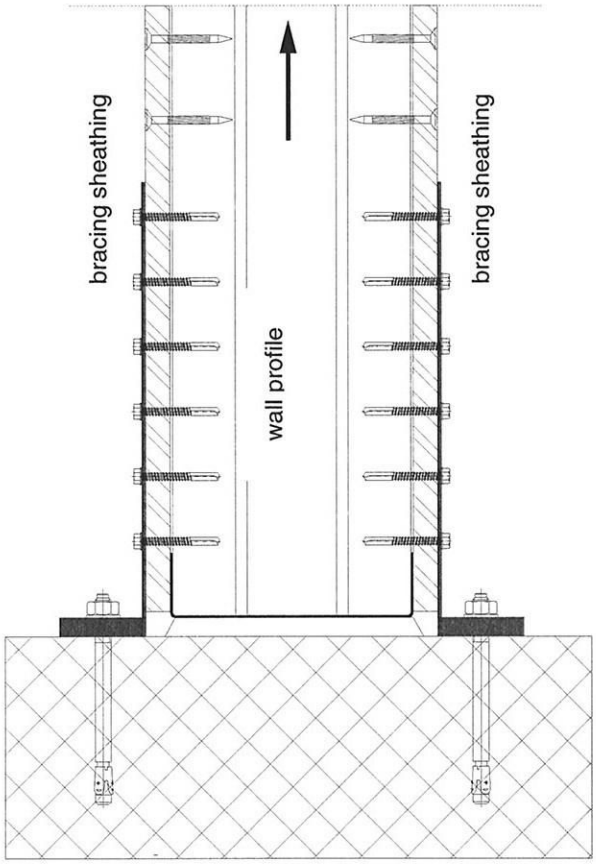
Tension anchor of factory-closed wall elements

Vertical section



Tension anchor of a one-sided braced wall

Vertical section



Tension anchor of a double-sided braced wall

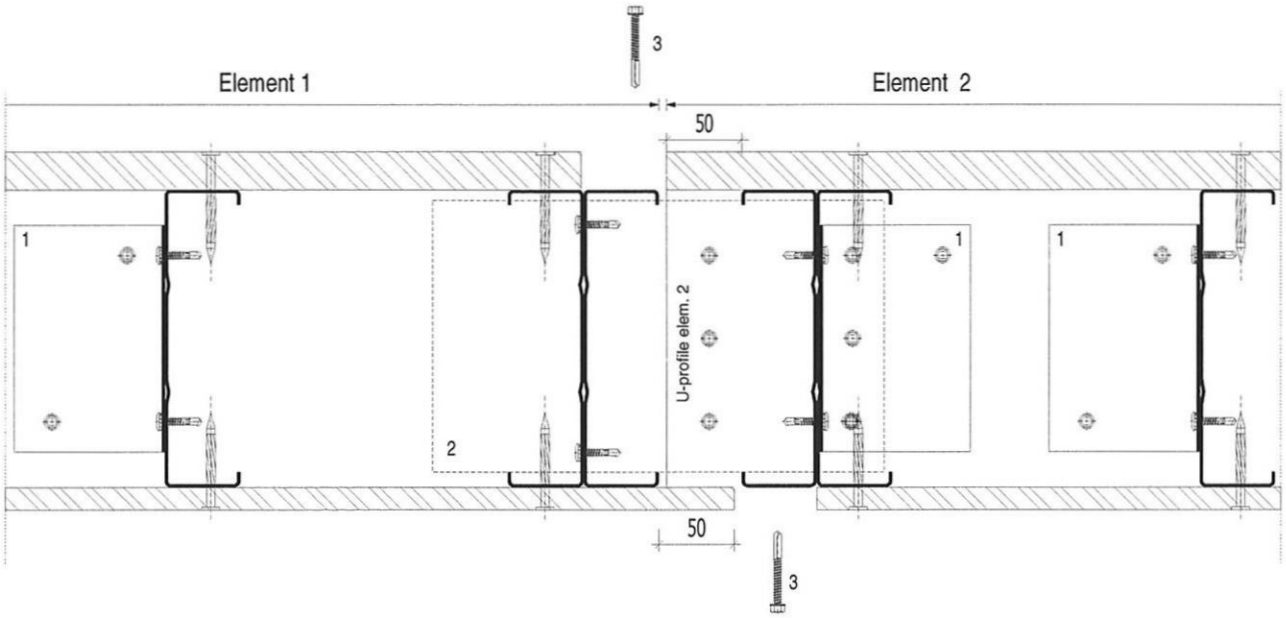
Tension anchor and number of fasteners according to structural design

Fasteners sheathing, screw joint of Cocoon profiles, insulation, steam brake, etc. not shown for reasons of simplification

Macht das Projekt leichter.	**Annex 12**
Tension anchor of factory-closed wall elements	to European Technical Approval **ETA-11/0105**

Connection of factory-closed floor elements

Vertical section

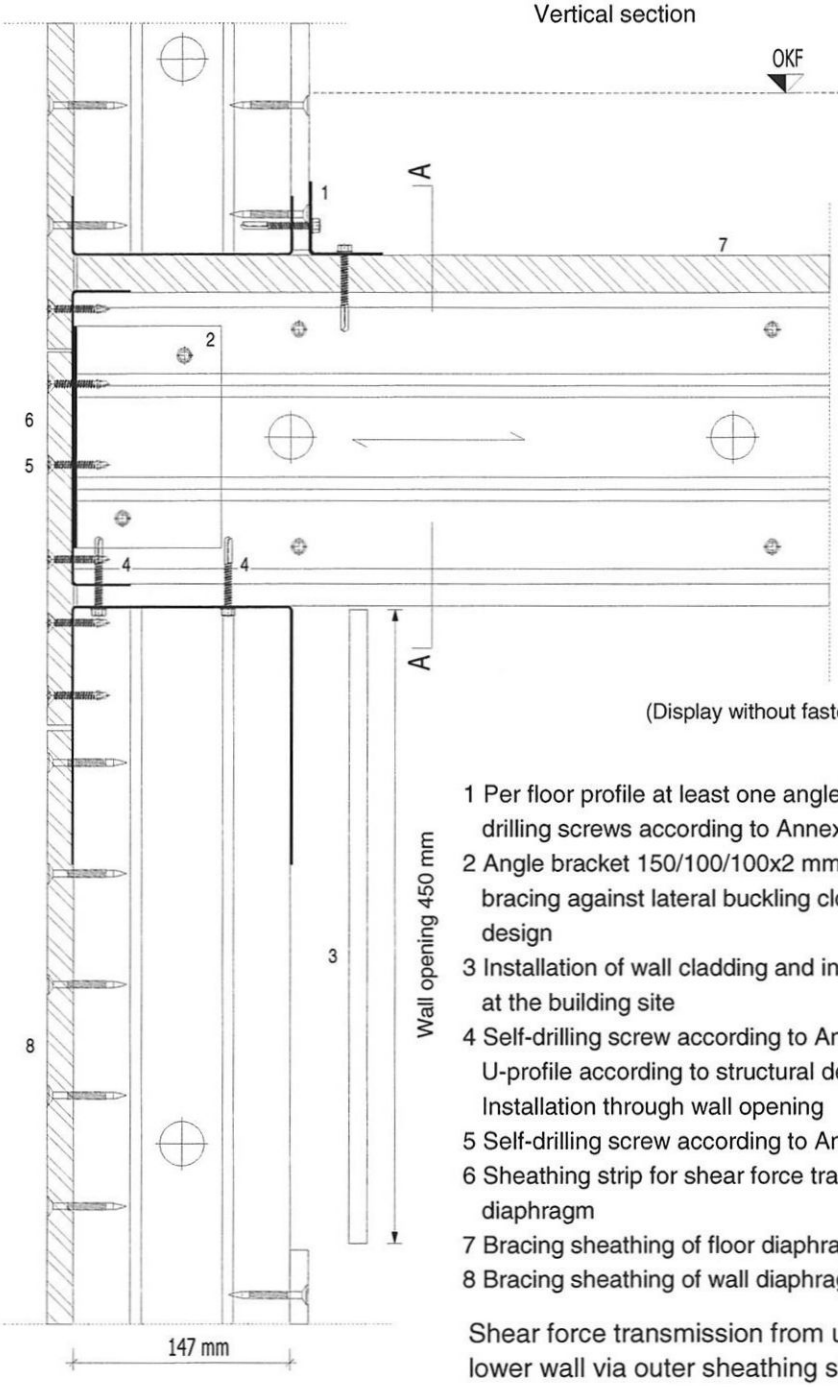


1 Angle bracket 150/100/100x2 mm for joint of C-profile to U-profile and as bracing against lateral buckling close to supports
2 Butt plate t = 2mm bolted to U-profiles. Dimensioning according to structural design
3 Fasteners according to Annex 8. Distance according to structural design

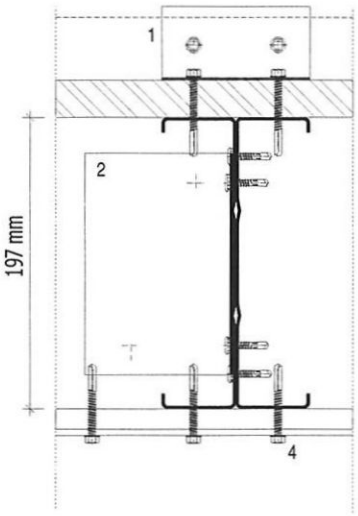
Insulation, steam brake, etc. not shown for reasons of simplification

Connection floor / Exterior wall
outer sheathing, factory-closed elements

Vertical section



Section A-A



(Display without fasteners of sheathing)

1 Per floor profile at least one angle bracket 50/50/100x2 mm and 2x2 self-drilling screws according to Annex 9 and structural design
2 Angle bracket 150/100/100x2 mm for joint of C-profile to U-profile and as bracing against lateral buckling close to supports according to structural design
3 Installation of wall cladding and insulation after fastening of floor elements at the building site
4 Self-drilling screw according to Annex 9, on floor profile 2x2 and alongside U-profile according to structural design (shear force transmission). Installation through wall opening
5 Self-drilling screw according to Annex 8
6 Sheathing strip for shear force transmission between upper and lower wall diaphragm
7 Bracing sheathing of floor diaphragm
8 Bracing sheathing of wall diaphragm

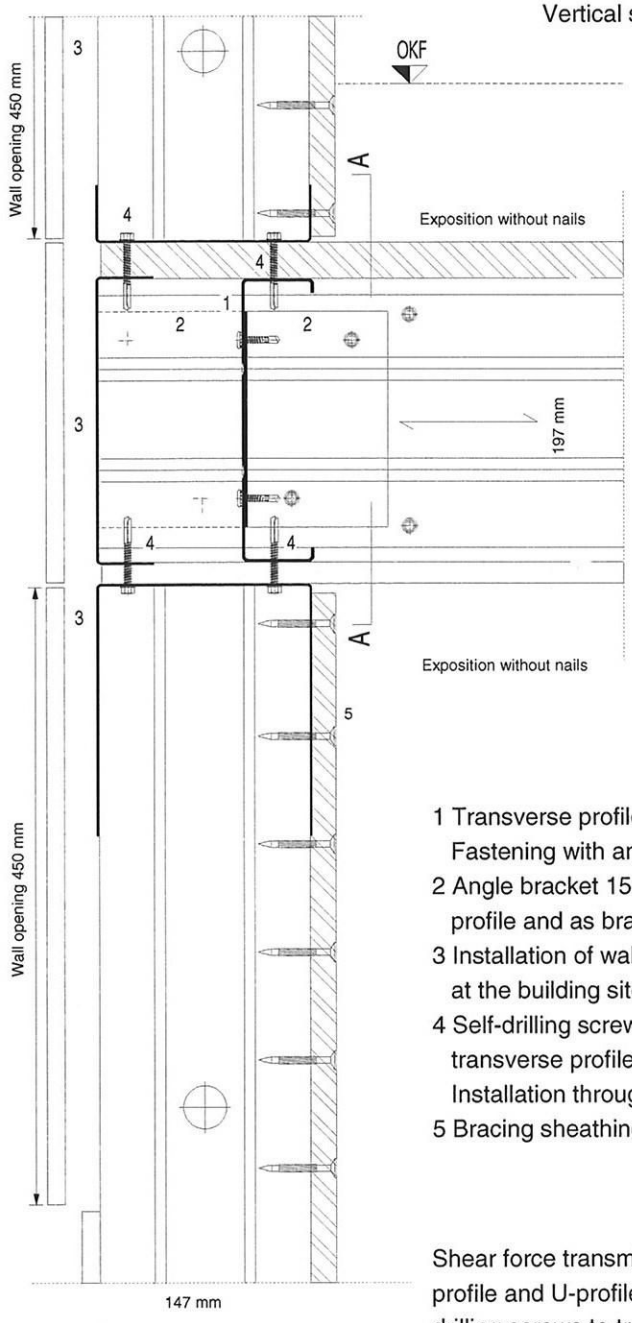
Shear force transmission from upper wall and floor element to lower wall via outer sheathing strip and self-drilling screws

Insulation, steam brake, etc. not shown for reasons of simplification

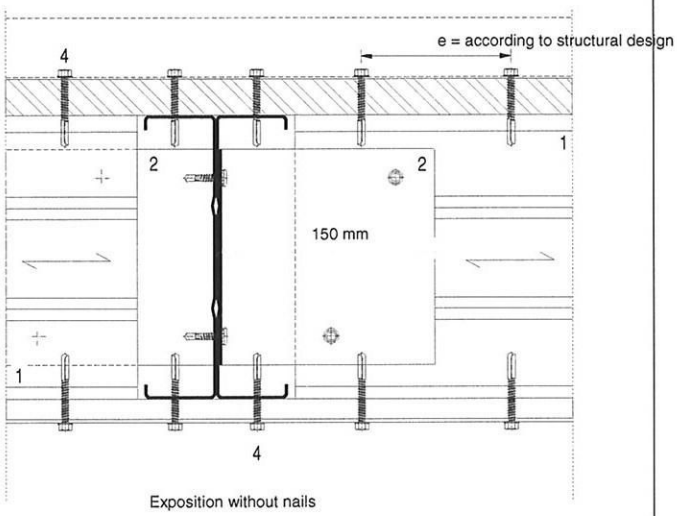
Macht das Projekt leichter.	**Annex 14**
Connection floor / exterior wall	to European Technical Approval **ETA-11/0105**

Connection floor / exterior wall
inner bracing sheathing, factory-closed elements

Vertical section



Section A-A



1 Transverse profile as bracing element and for shear force transmission. Fastening with angle bracket to floor joist.
2 Angle bracket 150/150/100x2 mm for joint of transverse profile to floor profile and as bracing against lateral buckling close to supports
3 Installation of wall cladding and insulation after fastening of floor elements at the building site
4 Self-drilling screw according to Annex 9 on floor profile 2x2 and along transverse profile according to structural design (shear force transmission). Installation through wall opening
5 Bracing sheathing of wall diaphragm

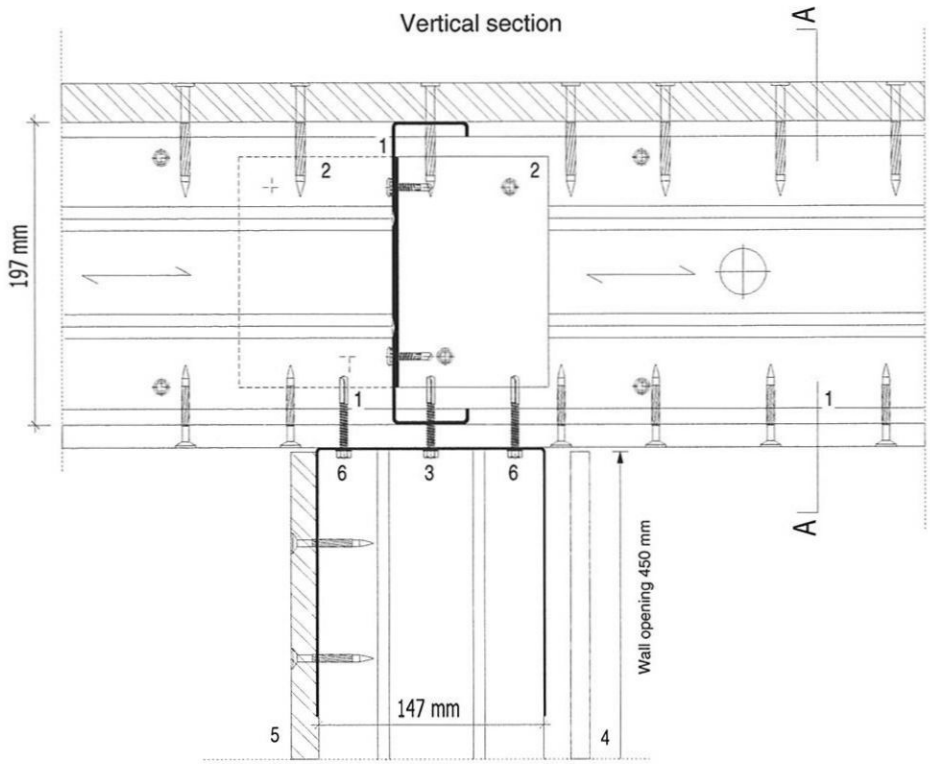
Shear force transmission from upper wall via self-drilling screw to transverse profile and U-profile. Shear force transmission from floor to lower wall via self-drilling screws to transverse profile, U-profile and lintel profile.

Insulation, steam brake, etc. not shown for reasons of simplification

Macht das Projekt leichter.	**Annex 15**
Connection floor / exterior wall	to European Technical Approval **ETA-11/0105**

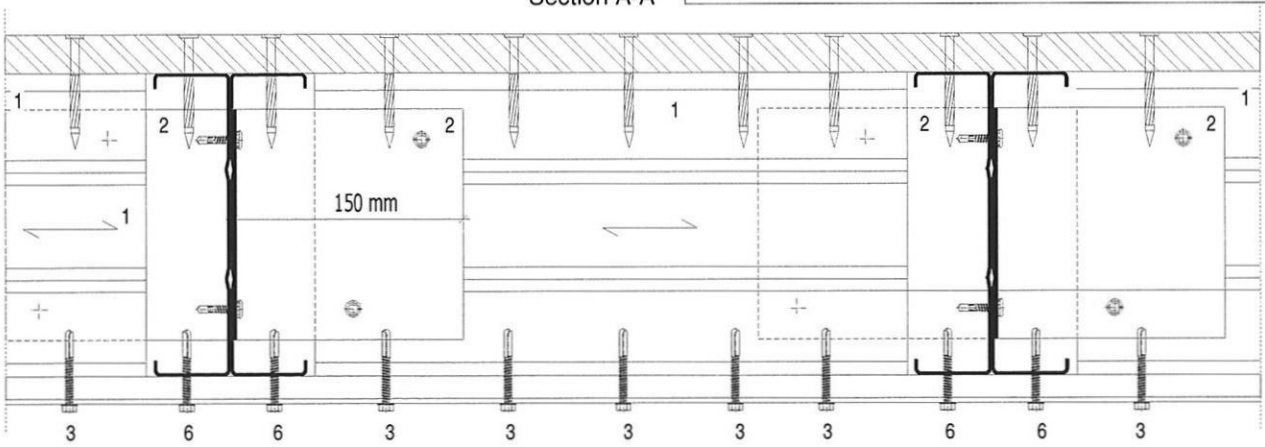
Connection load-bearing floor / load-bearing interior wall continuous floor profile

Vertical section



Section A-A

Insulation, etc. not shown for reasons of simplification



1 Stiffener in the range of supports and stiffening profile for shear force transmission. Fastening to floor profile via angle brackets. Single or double profile.

2 Angle bracket 150/150/100x2 mm for joint of C-profile to U-profile and for bracing against lateral buckling in the range of local supports according to structural design.

3 Self-drilling screw alongside bracing profile according to structural calculation (shear force transmission). Installation through wall opening.

4 Installation of sheathing or insulation after fastening of the floor elements on site

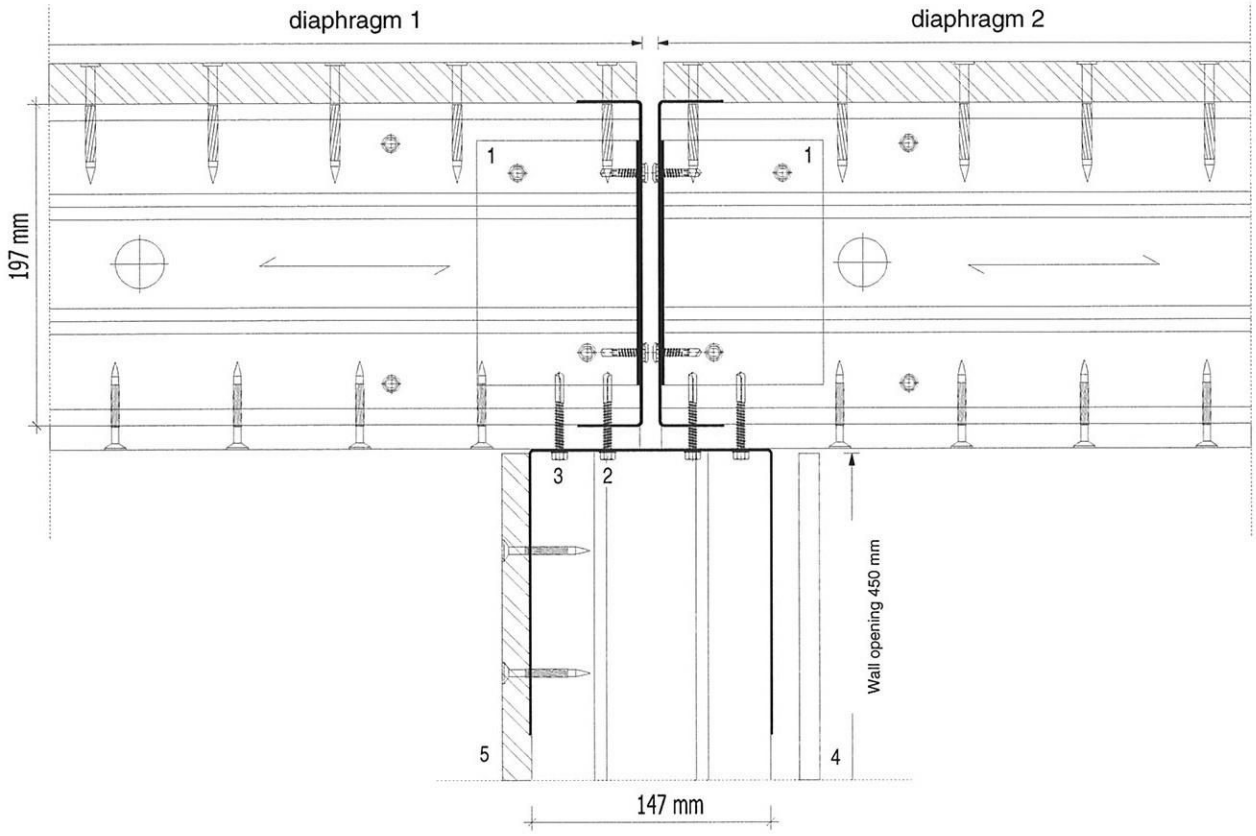
5 Bracing sheathing of wall diaphragm

6 Self-drilling screw according to Annex 9 on floor joist 2x2 according to structural design

Macht das Projekt leichter.	**Annex 16**
Connection load-bearing floor / load-bearing interior wall	to European Technical Approval **ETA-11/0105**

Connection load-bearing floor / load-bearing interior wall
Discontinuous floor profile, no shear transfer between floor diaphragms

Vertical section



1 Angle bracket 150/150/100x2 mm for connection C-profile to U-profile and as bracing against lateral buckling close to supports according to structural design
2 Self-drilling screw according to Annex 9 alongside U-profile according to structural design (shear force transmission). Installation through wall opening.
3 Self-drilling screw according to Annex 9 floor profile 2x2 according to structural design
4 Installation of sheathing or insulation after fastening of the floor elements on site
5 Stiffening sheathing of wall diaphragm

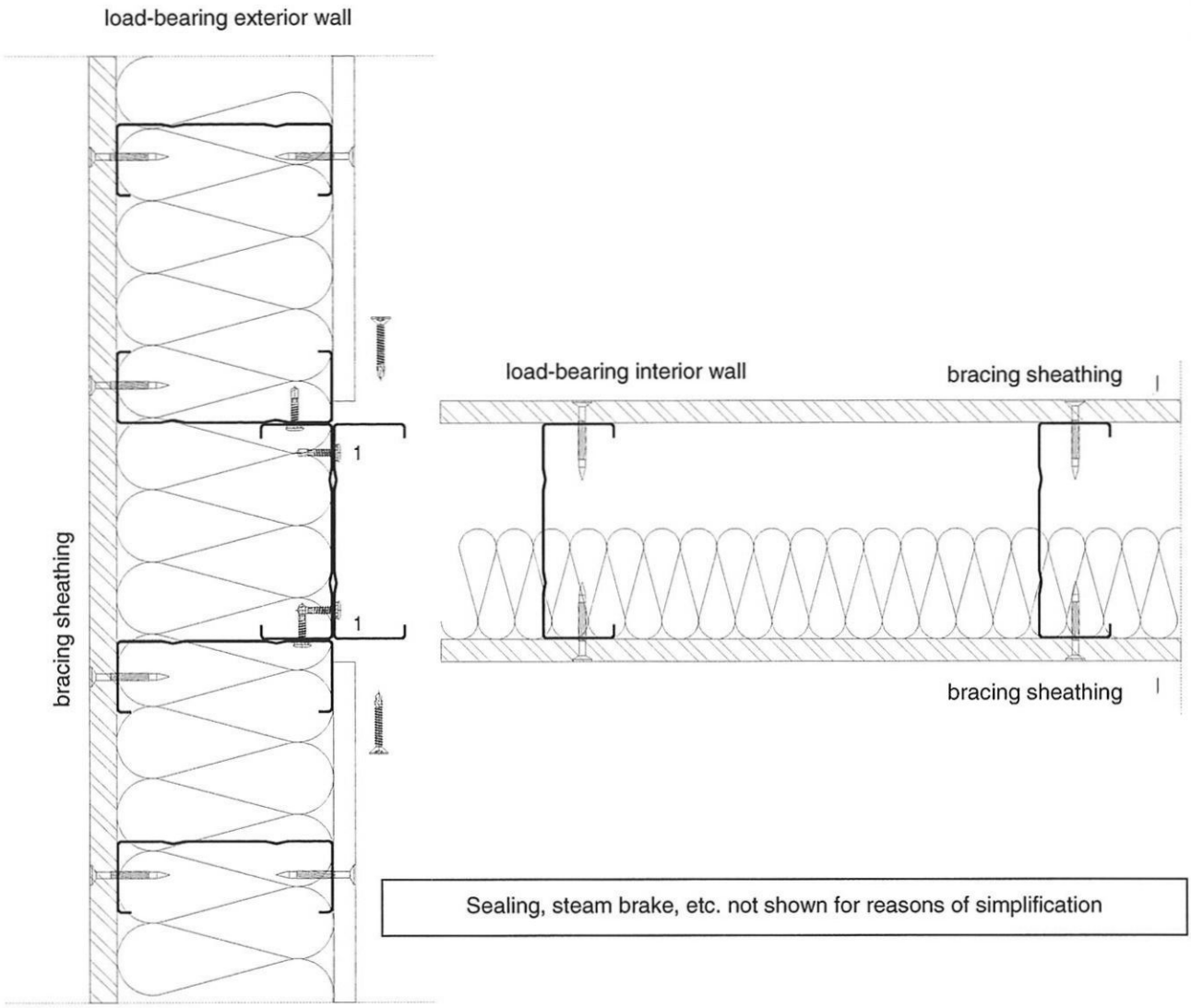
Both floor elements can be connected to transfer shear forces on demand. In this case, the connection of floor diaphragm shall be carried out and designed according to Annex 13.

Insulation etc. not shown for reasons of simplification

Macht das Projekt leichter.	**Annex 17** to European Technical Approval **ETA-11/0105**
Connection load-bearing floor / load-bearing interior wall Discontinuous floor profile	

Connection load-bearing exterior wall / load-bearing interior wall

Horizontal section



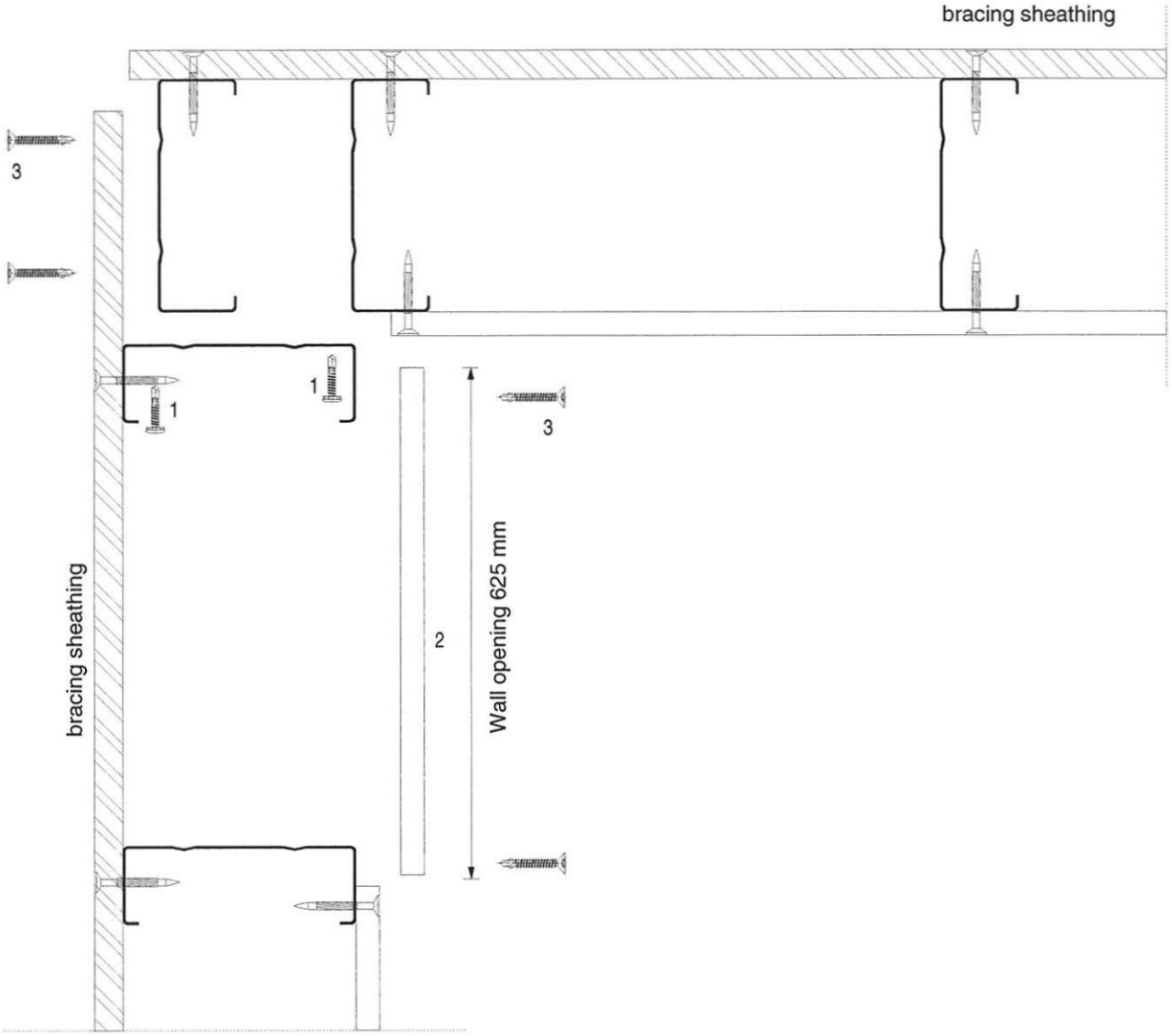
Sealing, steam brake, etc. not shown for reasons of simplification

1 Self-drilling screw according to Annex 9 along wall profile (C-profile) and structural design
2 Self-drilling screw according to Annex 8 and structural design

Macht das Projekt leichter.	**Annex 18** to European Technical Approval **ETA-11/0105**
Connection load-bearing exterior wall / load-bearing interior wall, horizontal section	

Corner connection of load-bearing exterior walls

Horizontal section

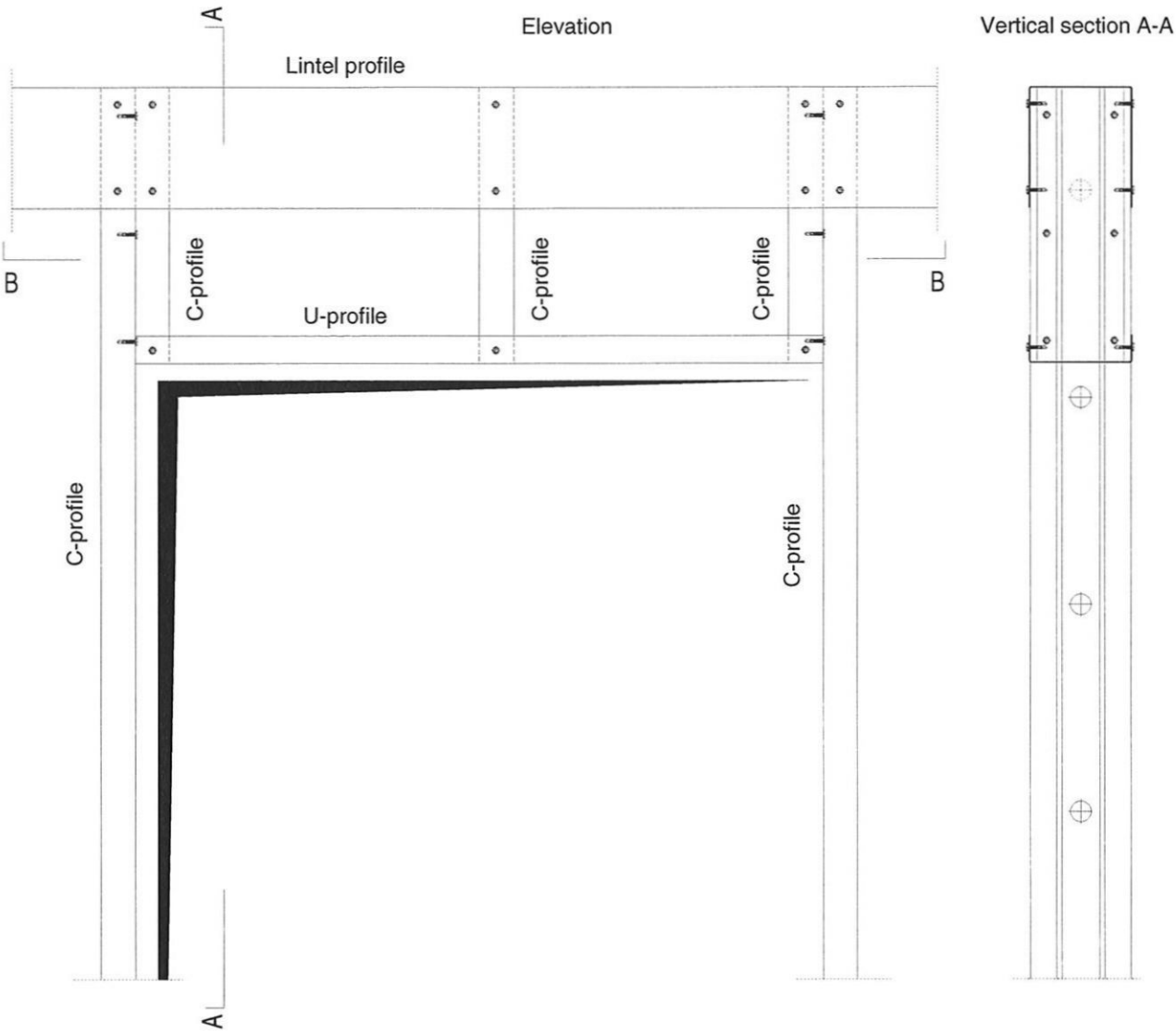


1 Self-drilling screw according to Annex 9, installation through wall opening
2 Installation of sheathing or insulation after fastening of the floor elements on site
3 Self-drilling screw according to Annex 8

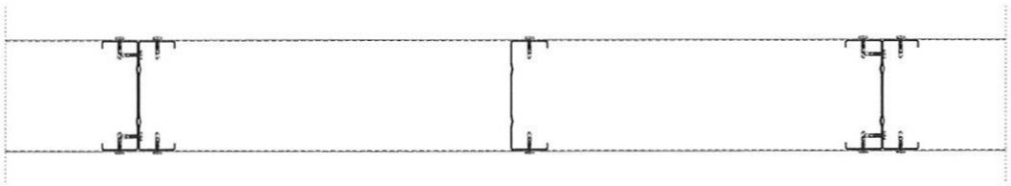
Sealing, steam brake, etc. not shown for reasons of simplification

Macht das Projekt leichter.	**Annex 19**
Corner connection of load-bearing exterior walls	to European Technical Approval **ETA-11/0105**

Door lintel



Horizontal section B-B



Sheathing, insulation, etc. not shown for reasons of simplification

Design values and required verifications for wall and floor profiles

The characteristic values of load-bearing capacity of wall and floor profiles and lintel profiles should be taken from Annexes 22 and 23. Design values result from characteristic values by dividing them by the partial safety factor γ_{M1} according to section 2.1.4.

a) For axial loads without horizontal loads the following applies:

$$\frac{N_{Ed}}{N_{b,Rk} / \gamma_{M1}} \leq 1$$

b) For floor profiles without axial force the following applies:

$$\frac{M_{Ed}}{M_{Rk} / \gamma_{M1}} \leq 1$$

c) For floor profiles with support reaction forces F_{Ed} (including transmitted forces from storeys above) the following applies:

$$\frac{F_{Ed}}{R_{Rk} / \gamma_{M1}} \leq 1$$

d) Combined loading from bending moment and axial force
For wall profiles with eccentric axial loading N_{Ed} or bending moments M_{Ed} due to wind loads or other horizontal forces as well as for floor profiles with axial forces due to diaphragm action the following shall be verified:

$$\left(\frac{N_{Ed}}{N_{b,Rk} / \gamma_{M1}}\right)^{0.8} + \left(\frac{N_{Ed} \cdot e + M_{Ed}}{M_{Rk} / \gamma_{M1}}\right)^{0.8} \leq 1$$

e) Combined loading from bending moment and support reaction
For floor profiles with combined loading from bending moment M_{Ed} and support reaction force F_{Ed} (including transferred forces from storeys above) the following shall be verified:

$$\frac{M_{Ed}}{M_{Rk} / \gamma_{M1}} + \frac{F_{Ed}}{R_{Rk} / \gamma_{M1}} \leq 1.25 \quad \text{and} \quad \frac{M_{Ed}}{M_{Rk} / \gamma_{M1}} \leq 1 \quad ; \qquad \frac{F_{Ed}}{R_{Rk} / \gamma_{M1}} \leq 1$$

where:

$N_{b,Rk}$ = Characteristic value of resistance to axial compression forces of the wall profile in dependence of the buckling length according to Annex 22 and of the floor profile according to Annex 23 or on the basis of calculation according to EN 1993-1-3

M_{Rk} = Characteristic value of resistance to bending moments according to Annex 22 and 23

e = 0 in case of axial loads

= h_P / 2 in case of eccentric loads, h_p = height of wall or floor profile

R_{Rk} = Characteristic value of resistance of floor profiles for support forces according to Annex 23

CCDCCDCDN Macht das Projekt leichter.	**Annex 21** to European Technical Approval
Design values and required verifications for wall and floor profiles	**ETA-11/0105**

Characteristic values of resistance and section properties, wall and lintel profiles

Type	Profile	t_N	t_k	A_g	J_g	A_{eff}	W_{eff}	J_{eff}	M_{Rk}	$N_{b,Rk}$ in [kN] for s_k in [m]			V_{Rk}
		[mm]	[mm]	[cm²]	[cm⁴]	[cm²]	[cm³]	[cm⁴]	[kNm]	2,60	3,50	4,00	[kN]
Wall profiles	U 100/40/1.5	1.50	1.46	2.59	39.48	1.47	5.79	33.55	1.85	36.29	29.99	26.53	24.24
	U 100/40/2.0	2.00	1.96	3.45	52.15	2.48	8.57	47.69	2.74	57.29	45.27	39.12	35.50
	U 150/40/1.5	1.50	1.46	3.32	103.13	1.52	9.41	88.12	3.01	43.85	40.24	38.10	24.24
	U 150/40/2.0	2.00	1.96	4.43	136.80	2.62	15.45	126.76	4.94	73.12	65.75	61.39	43.69
	U 200/40/1.5	1.50	1.46	4.05	208.22	1.55	12.95	169.40	4.14	47.61	45.15	43.75	18.42
	U 200/40/2.0	2.00	1.96	5.41	276.84	2.68	21.63	256.02	6.92	80.62	75.68	72.82	43.69
	U 250/40/2.0	2.00	1.96	6.39	484.52	2.72	27.77	429.49	8.89	85.18	81.46	79.37	35.68
	U 300/40/2.0	2.00	1.96	7.37	772.09	2.75	33.97	654.08	10.87	88.00	85.34	83.68	29.69
	C 97/50/1.5	1.50	1.46	3.08	48.01	2.10	8.53	43.53	2.73	53.58	44.02	38.45	24.24
	C 96/50/2.0	2.00	1.96	4.08	61.63	3.26	11.74	57.69	3.76	79.17	62.27	53.20	34.05
	C 147/50/1.5	1.50	1.46	3.81	125.15	2.09	13.56	111.75	4.34	61.47	57.23	54.53	24.24
	C 146/50/2.0	2.00	1.96	5.06	162.63	3.31	20.10	151.17	6.43	95.45	87.56	82.47	43.69
	C 197/50/1.5	1.50	1.46	4.54	249.95	2.08	18.19	211.74	5.82	64.30	61.73	60.19	18.71
	C 196/50/2.0	2.00	1.96	6.04	326.87	3.31	27.81	300.53	8.90	101.14	96.48	93.65	43.69
Lintel profiles	S 100/175/1.5	1.50	1.46				18.64	193.48	5.97				
	S 100/175/2.0	2.00	1.96				25.75	274.70	8.24				
	S 150/175/1.5	1.50	1.46				18.82	197.80	6.02				
	S 150/175/2.0	2.00	1.96				26.13	284.35	8.36				
	S 200/175/1.5	1.50	1.46				18.90	199.90	6.05				
	S 200/175/2.0	2.00	1.96				26.30	288.96	8.42				

where: A_g = Gross cross section area

J_g = Moment of inertia

A_{eff} = Effective cross section area for axial compression force with f_{yb} = 320 N/mm²

W_{eff} = Section modulus for effective cross section area

J_{eff} = Effective moment of inertia for deformation calculation

M_{Rk} = Characteristic value of resistance to bending moment, $M_{Rk} = W_{eff} \cdot f_{yb}$

$N_{b,Rk}$ = Characteristic value of resistance to normal force in case of axial compression in dependence of buckling length s_k

V_{Rk} = Characteristic value of resistance to shear force (shear buckling)

Characteristic values of resistance and section properties, floor profiles

Profile	t_N [mm]	t_k [mm]	A_g [cm²]	J_g [cm⁴]	A_{eff} [cm²]	W_{eff} [cm³]	J_{eff} [cm⁴]	M_{Rk} [kNm]	$N_{b,Rk}$ [kN]
D1 C 146/50/2.0	2.00	1.96	5.06	162.6	3.31	20.10	151.2	6.43	82.47
DT1 C 146/50/2.0	2.00	1.96	10.12	325.3	6.62	40.20	302.3	12.86	164.93
D2 C 196/50/2.0	2.00	1.96	6.04	326.9	3.31	27.81	300.5	8.90	93.65
DT2 C 196/50/2.0	2.00	1.96	12.08	653.7	6.62	55.62	601.1	17.80	187.30
D3 U 246/50/2.0	2.00	1.96	6.70	523.5	2.76	28.18	441.8	9.02	81.06
DT3 U 246/50/2.0	2.00	1.96	13.40	1047.0	5.52	56.36	883.5	18.04	162.12
D4 U 296/50/2.0	2.00	1.96	7.68	830.6	2.79	34.53	673.2	11.05	85.28
DT4 U 296/50/2.0	2.00	1.96	15.36	1661.2	5.58	69.06	1346.4	22.10	170.57

			Single load or support load			Opposite transverse loads (pass through)			
Profile	t_N [mm]	t_k [mm]	$R_{A,Rk}$ [kN]	$R_{B,Rk,50}$ [kN]	$R_{B,Rk,150}$ [kN]	$R_{A,Rk}$ [kN]	$R_{B,Rk,50}$ [kN]	$R_{B,Rk,150}$ [kN]	V_{Rk} [kN]
D1 C 146/50/2.0	2.00	1.96	13.97	19.21	26.57	9.24	23.65	32.21	43.69
DT1 C 146/50/2.0	2.00	1.96	27.93	38.42	53.14	18.48	47.29	64.42	87.38
D2 C 196/50/2.0	2.00	1.96	13.97	19.21	26.57	9.24	23.65	32.21	43.69
DT2 C 196/50/2.0	2.00	1.96	27.93	38.42	53.14	18.48	47.29	64.42	87.38
D3 U 246/50/2.0	2.00	1.96	13.97	19.21	26.57	9.24	23.65	32.21	36.26
DT3 U 246/50/2.0	2.00	1.96	27.93	38.42	53.14	18.48	47.29	64.42	72.52
D4 U 296/50/2.0	2.00	1.96	13.97	19.21	26.57	9.24	23.65	32.21	30.10
DT4 U 296/50/2.0	2.00	1.96	27.93	38.42	53.14	18.48	47.29	64.42	60.20

where: A_g = Gross cross sectional area

J_g = Moment of inertia

A_{eff} = Effective cross sectional area for axial compression force with f_{yb} = 320 N/mm²

W_{eff} = Section modulus for effective cross section area

J_{eff} = Effective moment of inertia for deformation calculation

M_{Rk} = Characteristic value of resistance to bending moment, $M_{Rk} = W_{eff} \cdot f_{yb}$

$N_{b,Rk}$ = Characteristic value of resistance to normal forces in case of axial compression, for buckling length s_k= 4,0 m

$R_{A,Rk}$ = Characteristic value of resistance to reaction force at end supports

$R_{B,Rk,50}$ = Characteristic value of resistance to reaction force at intermediate supports, width b_B = 50 mm

$R_{B,Rk,150}$ = Characteristic value of resistance to reaction force at intermediate supports, width b_B = 150 mm

V_{Rk} = Characteristic value of resistance to shear force (shear buckling)

Resistance terms $R_{A,Rk}$ and $R_{B,Rk}$ can also be used for verification of transferred forces from storeys above.

Floor diaphragms: Design and requirements for execution

Floor diaphragms (cf. Annex 7) shall be surrounded by webs (steel profiles) and have several continuous inner webs, which are arranged with a unit spacing a_r and are parallel to the outer profiles. The edge webs of the diaphragms shall not be butted, or butt joints shall be designed rigidly. In this regard, butt joints are rigid, when the design value of load-bearing capacity of the joint is greater than 1.5 times the design value of the loading.
The sheathing panels are arranged in rows parallel or perpendicular to the continuous webs. In one direction, the sheathing panels shall always be jerked on webs. In the other direction, the panel edges are not connected or connected shear-resistant e.g. by butt plates.
The joint of sheathing and web is loaded along the web's axis by a shear force per unit length, which is to be assumed as locally constant for each web.
Spacing a_v ($20\ d \leq a_v \leq 40\ d$) between fasteners is continuous at all panel edges on webs and possible butt plates.
For the design of floor diaphragms, which transfer their horizontal support reactions to Cocoon light weight construction wall diaphragms the support reactions of diaphragms that are continuous over several spans may be determined without exact verification and without considering the effect of continuity. The edge webs that are used as supporting should be designed to resist the support reactions. The transmission of the support reactions should be verified.
The regulations of EN 1995-1-1:2004+A 1:2008 apply accordingly. The verification of diaphragm deflection is not necessary, if the sheathing's lateral length is at least 1m and the floor diaphragm's span is less than 4b, where b is the floor diaphragm's width.
If, in contradiction to EN 1995-1-1:2004+A 1:2008, there are unconnected panel edges perpendicular to the inner webs, the load-bearing capacity $f_{p,Rk}$ (according to section 2.1.4) shall be reduced by a third and within the range of the unconnected panel edges, the minimum edge spacing as for bottom sills mentioned in Table 26.3 shall be taken into account. Glued key and slot joints without fishplate joint shall be considered as unconnected panel edges. In addition, the following requirements shall be observed:

- Panels are staggered by at least the unit spacing a_r of the webs,
- the distance a_r between the webs is not exceeding 0.75-times the panel's length in direction of the webs,
- the panels are also connected with fastening elements at intervals of a_v to the webs on which the panels are not abutted,
- the diaphragm's span L is less than 12.5 m or there are not more than three rows of panels,
- the diaphragm's height h in direction of load is at least L/ 4 (L = effective span),
- the action's design value is not exceeding 5.0 kN/m.

Floor diaphragms: Design and requirements for execution

(continued)

The joint between single floor diaphragm elements as part of a floor diaphragm shall have at least the same load-bearing capacity as the connection of sheathing and edge webs.

The stresses of the diaphragms may be determined for reasons of simplification according to the technical beam theory. The upper and lower edge web should be designed as single-effective cords in order to resist the force resulting from the maximum bending moment. The sheathing has to be designed for shear flow resulting from the maximum shear force whereas the shear flow in the diaphragm may be assumed to be uniformly distributed over the width of the diaphragm. The effect of actions, occurring from loading perpendicular to the outer web, may be disregarded as long as the following is observed:

- The effective height h of diaphragms with application of loading in direction of the continuous inner webs must not be larger than the span L.
- If the structural behaviour is not exactly determined and the load application is not verified, the effective height h of diaphragms shall not be larger than L/2 when loads are acting on both edges and shall not be larger than L/4 for one-sided loads.

The verification of shear strength and buckling of the sheathing is not required.

Product	Technical regulation	Minimum thickness in [mm]		Building material category acc. to EN 13501	Function
		Wall	Floor		
Resin-bonded chipboard P5 or P7	EN 13986	15	19	D-s2, d0	load-bearing
Cement-bonded chipboard	EN 13986	16	19	B-s1, d0	load-bearing
OSB/3 or OSB/4-board	EN 13986	15	22	D-s2, d0	load-bearing
Fermacell gypsum fibre board	ETA-03/0050	15	-	A2-s1, d0	load-bearing
Rigidur H gypsum fibre board	ETA-08/0147	15	-	A1	load-bearing
Vidiwall SK, VT gypsum fibre board	ETA-07/0086	15	-	A2-s1, d0	load-bearing

Table 26.1: Sheathing material, minimum thicknesses and building material categories

Component	Wall				Floor			
Thickness of profiled steel sheeting in [mm]	1.5		2.0		1.5		2.0	
Nail diameter in [mm]	2.2	2.8	2.2	2.8	2.2	2.8	2.2	2.8
Resin-bonded chipboard P5 or P7	730	-	-	950	892	-	-	1117
Cement-bonded chipboard	843	-	-	1087	958	-	-	1251
OSB/3 or OSB/4-board	730	-	-	950	940	-	-	1253
Gypsum fibre board[1]	597	-	-	878	-	-	-	-

[1] For Rigidur H gypsum fibre boards the verification of shear strength and buckling has to be carried out. For reasons of simplification the load bearing capacity referred to the length of the connection may be limited to F_{rk}/a_v = 9.3 N/mm instead.

Table 26.2: Characteristic values of load-bearing capacity per shear joint and ballistic nail $F_{f,Rk}$ in [N] for minimum sheathing thicknesses according to Table 26.1

Component	Wall profile and head rail		Sill	
Nail diameter in [mm]	2.2	2.8	2.2	2.8
Resin-bonded chipboard, OSB- and gypsum fibre board	10	12	15	20
Cement-bonded chipboard	33	42	33	42

Table 26.3: Minimum distances of ballistic nails perpendicular to the edge of the sheathing in [mm]

Component	Type of screw	Wall		Floor	
Thickness of profiled steel sheeting t_n in [mm]		1.5 or 2.0		1.5 or 2.0	
Screw diameter d in [mm]		3.9	5.5	3.9	5.5
Resin-bonded chipboard	Self-drilling screw	769	853	998	1106
Cement-bonded chipboard	Drywall self-drilling screw	960	1102	1086	1354
OSB/3 or OSB/4-board	Self-drilling screw	769	853	1006	1299
Gypsum fibre board	Drywall self-drilling screw	723	-	-	-

Table 27.1: Characteristic values of load-bearing capacity per shear joint and screw $F_{f,Rk}$ in [N] (perpendicular to screw axis) for minimum sheathing thicknesses according to Annex 26, Table 26.1

Component	Wall profile and head rail	Sill or wall plate
Resin-bonded chipboard, OSB-board and gypsum fibre board	5d	7d
Cement-bonded chipboard	15d	15d

Table 27.2: Minimum distances of screws perpendicular to the edge of the sheathing in [mm]
d = screw diameter in [mm]