Deutsches Institut für Bautechnik

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Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-16/0053 of 13 July 2017

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	FingerHaus
Product family to which the construction product belongs	Timber building kits
Manufacturer	FingerHaus GmbH Auestraße 45 35066 Frankenberg/Eder DEUTSCHLAND
Manufacturing plant	FingerHaus GmbH Auestraße 45 35066 Frankenberg/Eder DEUTSCHLAND
This European Technical Assessment contains	98 pages including 2 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	Guideline for European technical approval of "Timber building kits", ETAG 007, used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011.

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Specific part

1 Technical description of the product

The company FingerHaus GmbH manufactures timber building kits with the trade name "FingerHaus".

A building kit consists of pre designed and prefabricated building components such as walls, roofs and floors in varying numbers according to the scope of application (building project). Depending on the building project the kit is put together at the factory and mounted on site.

The main load-bearing structures are timber elements with planking.

The prefabricated building components and the related components are shown in Annex A. Essential construction details are described in Annex B.

Windows and exterior doors are generally part of the kit.

The building components are prefabricated and shall normally be taken to the building site as complete elements. Some layers of the kit, like the gypsum board of wall and roof elements shall be mounted on site.

The dimensioning of building elements and the selection of materials for wall-, floor- and roof-elements shall be carried out in accordance with the requirements of structural and building physics calculations. Dimensions of elements may vary. The Moisture content (max. 20 %) of solid wood elements shall be tested at the factory through sample at random. The load bearing connections between the building elements in factory production as well as at the assembling on building site shall be determined with structural designed fasteners.

Non-load-bearing internal walls might be arranged in any way.

Exterior walls either get external insulation systems according to European technical assessments ETA-11/0505[1] or ETA-08/0303[1] (description see Details A to C in Annex A) or have been designed in accordance with generally recognised rules of construction (description see Details D to L in Annex A).

For roof coverings usually concrete tiles according to EN 490[2]/491[3] or clay tiles according to EN 1304[4] are used. Other roofing which fulfils the applicable requirements may also be used. The roofing is not part of the kit.

Examples of connections between particular building components among each other are shown in Annex B.

The necessary characteristics for structural design can be gathered from Annex A or from standards referred to in there, or from European technical assessments, etc.

The anchorage of the external wall building components to the substructure (basement or foundation slab made of concrete) is performed with structural designed fasteners. The anchorage of the external wall building components to the substructure is shown in Annex B, but it is not part of the kit.

The evidence of the suction safety of the wall building components with the substructure shall be provided.

[1] Other ETIC-Systems, which are intended for use of timber frame buildings' walls, may as well be used. These ETIC-Systems shall be suitable for the present building kit. Further national regulations of standard of the Member States might have to be met.

[2] EN 490:2011 — Concrete roofing tiles and fittings for roof covering and wall cladding - Product specifications

[3] EN 491:2011 — Concrete roofing tiles and fittings for roof covering and wall cladding - Test methods

[4] EN 1304:2005 — Clay roofing tiles and fittings - Product definitions and specifications

The exterior wall cladding (slate, straps, clinker, etc.), the internal linings (e.g.: tiles, murals, plaster, seals) of internal building components, roofing materials, floor linings, stairs, service installations and other building components which are needed for a complete building are not part of this European technical assessment (in the following called ETA).

Some additional load-bearing components (e.g. joists or steel girders for concentrated loads/ point loads) which, according to its structural analysis are required for each different construction works will usually be built-in building components.

Building components are not treated with fire protection agents.

No used wood is used for this kit.

Substructure

The substructure of the building is not part of this ETA.

The kit can be used for separate building works or be placed as a heightening on an existing building. The tolerances of the surface of the substructure normally amount to ± 30 mm but may amount up to ± 60 mm for heightening.

More information as to the dimensions, if necessary and the description of the details (e.g. protective measures against rising moisture) for the manufacture of the substructure will be delivered by the manufacturer of the kit. The substructure shall be designed and built in accordance with the applicable building regulations.

Execution of construction works

The manufacturer provides an assembly schedule containing the following aspects:

- erection techniques and necessary equipment
- temporary bracing and weather protection
- completion of joints between components of the kit (fixing, sealing against climatic influences, etc.)
- fixing of wind anchorage to the substructure and between building parts
- additional building materials and building components applied on site and which are a precondition for the fitness of use of the kit
- special boundary conditions (e.g. special crane requirements, hoisting strap positions, etc.)

The completed building (construction works) shall comply with the applicable building regulations (regulations on the works). The relevant procedures for demonstrating compliance with the building regulations shall also be observed by the entity responsible for this act. An ETA for a timber building kit does not amend this process in any way.

The provisions for health protection and occupational safety shall be observed.

The building components of the kit are compiled at the manufacturing plant in accordance with this ETA.

The ETA is issued for the product on the basis of agreed data/information, deposited with Deutsches Institut für Bautechnik. Changes to the product or production process, which could result in this deposited data/information being incorrect, should 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 ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA shall be necessary.

Manufacture and planning and design

The manufacture of a kit shall be conducted on the basis of a specific structural design for the construction works. The structural design shall comply with the applicable building regulations (regulations concerning construction works).

The factory production of the building components normally takes place in dry and heated sites and the temporary storage of the components is usually below roofs.

Packaging, transport and storage

The instructions of the manufacturer related to packaging, transport and storage shall be observed.

Use, maintenance, repair

It is the manufacturer's responsibility to ensure that exact instructions are enclosed to each delivery regarding the use of the kit which includes both the general conditions of this European technical assessment as well as the specific installation instructions.

Serviceability

For the serviceability of the kit it shall be ensured that suspended floors have sufficient stiffness to avoid unacceptable vibration through normal use. The assessment of this requirement is part of the calculation of mechanical resistance and structural stability.

Local building regulations

As basis for the manufacture and dimensioning of the kit a specification of the relevant requirements for the structural design, reaction to fire and the resistance to fire, protection against noise, the thermal insulation and the heat retention shall be drafted.

The assessments shall correspond to the intended methods and requirements including the assessment of the stability of the building in accordance with applicable building regulations.

2 Specification of the intended use in accordance with the applicable EAD

The timber building kit is intended to be used for the following types of buildings:

- residential buildings (single-, multi-storey, terraced houses, semi and multi-family houses)
- commercial buildings (hotel complexes, office buildings, industrial buildings)
- extensions and heightening of buildings
- public buildings (e.g. kindergartens, schools)

The intended use shall be evaluated in each individual case depending on the climatic boundary conditions.

The provisions made in this ETA are based on an assumed working life of "FingerHaus" of at least 50 years and of at least 25 years for the exterior wall cladding, provided that the conditions to utilisation, care and maintenance laid down in Clause 3.1 are met. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

The performances given in Section 3 are only valid if timber building kits are used in compliance with the specifications and conditions given in Annex A and B.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Mechanical resistance and stability for each load-bearing building component (walls, floors and roof structures) and their connections	See Annex A All building components are described with regard to their components and their structure
Resistance against seismic actions	No performance assessed (NPA)

By means of this description of the load-bearing building components both mechanical resistance and stability for each load-bearing building component and their connections between the components shall be determined.

Durability

Usually softwood that fulfils the needs of natural durability of solid wood according to EN 350[5] respective table 1 shall be used as construction wood.

Table 1: Classes of natural durability against destructive fungi

Wood Types	Classes of natural durability
Spruce and fir tree	4
Pine and larch wood	3-4

Only technically dried timber with a density up to 20 % is allowed to be used.

Generally building components are not treated with chemical wood preservatives. Building components of use classes 2 and 3 according to table 2 may be treated with appropriate chemical wood preservatives as protection against fungi and insects. (See as well Content, emission and/or release of dangerous substances) Solid wood and wood based panels according to use class 1 are not treated at all.

Table 2: Classification of building components according to EN 335-1 up to EN 335-3[6]

Type of building component	Use class
Load-bearing structures wall, ceiling , roof	1
Internal linings (non-loadbearing) and internal planking (load-bearing) of walls and ceilings	1
Sleepers (solid timber) of internal and external walls of the ground floor	2
Internal linings (non-loadbearing) and internal planking (load-bearing) of walls and ceilings, behind ventilation or for covering insulation	2
Weather exposed exterior walls including exterior wall cladding	3

Termites only exist in some areas of Europe. In these areas the use of timber without any chemical wood preservatives is not allowed.

[5] EN 350:2016 — Durability of wood and wood-based products - Natural durability of solid wood- Part 2: Guide to the natural durability and treatability of selected wood species of importance in Europe

[6] EN 335-1 up to 3 — Durability of wood and wood-based products - Definition of use classes -
Part 1: (2006) General
Part 2: (2006) Application to solid wood
Part 3: (1995) Application to wood-based panels

There shall not be considered any further precaution like prevention of flooring, foundation and walls in this European technical assessment.

Exterior wall cladding which hasn't been assessed as part of an ETA, wood preservation and moisture resistance has to be assessed in accordance with applicable building regulations.

In order to reach the intended working life of the kit, the user has to care and maintain it according to the service manual of the manufacturer. This service manual is part of the kit.

The durability against corrosion of metallic fasteners, used for these kits, has to meet the requirements of DIN EN 1995-1-1[7] under consideration of the corrosivity category according to EN ISO 12944-2[8].

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	The classification for reaction to fire of the components is given in Annex A
Resistance to fire	No performance assessed (NPA)
External fire performance of roof covering	No performance assessed (NPA)

3.3 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Vapour permeability and moisture resistance	The works shall be designed such that the building envelope with regards to interstitial and surface condensation meets the general requirements. The assessment of relevant building parts, including wet room envelopes, shall be calculated according to EN ISO 13788[9] taking into account relevant design climatic conditions. Particular building elements were calculated according to EN 15026[10] with specific conditions and stated in annex A.
Water tightness of the external envelope	Provided the kit is properly manufactured and assembled the building envelope is resistant to penetrating water (also driving rain-resistant) and snow. In case of ranges of application with extreme conditions of driving rain and snow the intended use shall be assessed in every individual case.

7	EN 1995-1-1:2004 + AC2006 + A1:2008	Eurocode 5: Design of timber structures - Part 1-1: General - Common rules and rules for buildings
8	EN ISO 12944-2:1998	Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 2: Classification of environments
9	EN ISO 13788:2013	Hygrothermal performance of building components and building elements - Internal surface temperature to avoid critical surface humidity and interstitial condensation - Calculation methods
10	EN 15026:2007	Hygrothermal performance of building elements - assessment of moisture transfer by numerical simulation

Essential characteristic	Performance
Water tightness of the internal surface finish	No performance assessed (NPA)
Content and/or release of dangerous substances	
Biocides	No performance assessed (NPA)
Content of active agents for root penetration in bitumen sheets	No performance assessed (NPA)
Biopersistent fibres	The half-life for tested WHO fibres is ≤ 40 days.
Formaldehyde	The wood-based panels "LivingBoard P4 and LivingBoard P5" were tested for its formaldehyde emission and satisfy class E1 in accordance with EN 13986[11] and EN 14080[12].
VOC, SVOC	No performance assessed (NPA)
Release scenarios regarding BWR 3: IA1, IA2, IA3, SW2	

3.4 Safety and accessibility (BWR 4)

Essential characteristic	Performance
Impact resistance	Due to technical experience the impact resistance is sufficient. The complete wall construction with a wood based panel or a gypsum board having thickness of at least 10 mm is sufficiently shock-proof.
Slipperiness of floor	No performance assessed (NPA)

3.5 Protection against noise (BWR 5)

Essential characteristic	Performance
Airborne sound insulation of walls, ceilings and roof structures	Weighted sound reduction index R_w of some walls see Annex A.

3.6 Energy economy and heat retention (BWR 6)

Essential characteristic	Performance
Thermal resistance	Thermal transmittance coefficients according to EN ISO 6946 of exterior walls and roofs are given in Annex A.
Air permeability	When the kit has been properly manufactured and assembled the building envelope is sufficiently airtight. The measuring shall be performed according to ISO 9972[13] or EN 13829[14], if necessary.
Thermal inertia	No performance assessed (NPA)

[11] EN 13986:2004 Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking

[12] EN 14080:2013 Timber structures - Glued laminated timber and glued solid timber - Requirements

[13] EN ISO 9972:2013 Thermal performance of buildings - Determination of air permeability of buildings - Fan pressurization method

[14] EN 13829:2000 Thermal performance of buildings – Determination of air permeability of buildings - Fan pressurization method (ISO 9972:1996 modified)

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

According to Decision 99/455/EC of the Commission[15], the system to be applied is 1.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

Issued in Berlin on 13 July 2017 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Warns

[15] Official Journal of the European Communities L 178/56-57 of 14.07.1999

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Annex A – Description of the building components

Table of contents

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a) Walls, Windows and Doors

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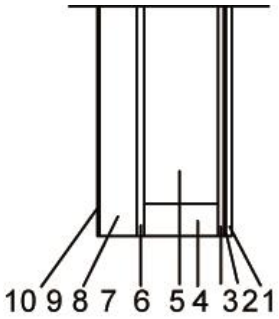
a) EW_ FingerHaus external wall, general



Construction build-up:
(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[1] (2006/673/EC) B-s1, d0[1] (2006/673/EC)
2	Vapour retarder layer	≥ 0,2	EN 13984	E
3.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[2]
4	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5	Mineral wool	≥ 90	EN 13162	A1
6.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
6.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[2]
7	Glue: according to ETA	Full-surface application	the whole system ETA 11/0505[3]	the whole system C-s2, d0
8.1	Polystyrene EPS	≥ 40, ≤ 200		
9	Plaster with reinforcement	1,8 up to 3,5		
10	External plaster - Stolit K / R / MP / Effect - StoSilco K / R / MP - StoLotusan K / MP - Sto-Superlit	1,5 up to 6,0		
8.2	Rock wool	≥ 40	the whole system ETA-07/0088[3]	A1

1 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.
2 Proof through ETA.
3 Other ETIC-Systems, which are intended for use of timber frame buildings' walls, may as well be used. These ETIC-Systems shall be suitable for the present building kit. Further national regulations of standard of the Member States might have to be met.

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Fixing devices:

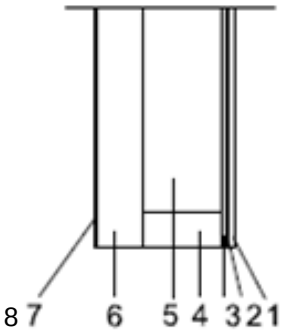
No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1	Gypsum board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
3.1 6.1	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
3.2 6.2	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
8.2	Rock wool	Staple	EN14592/A1	2,46 / 110	Only for fixing

Building physics characteristics

Build-up	Thickness [mm] λ [W/mK]							U-Value EN ISO 6946 [W/m²K]	Vapour diffusion EN 15026	Weighted sound reduction index R_w [dB]
Layer No.	**1**	**2**	**3.1**	**4**	**5**	**6.1**	**8.1**			
EW 160-80	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	80 0,032	0,147	*	44
EW 160-100	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	100 0,032	0,135	*	-
EW 160-120	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	120 0,032	0,124	*	-
EW 160-140	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	140 0,032	0,115	*	-
EW 240-60	12,5 0,25	0,2 -	13 0,13	240 0,13	160 0,032	12,5 0,32	60 0,35	0,123	*	-

* The calculation has been done under the following conditions:
- Outside climate: hourly climate data of the hygrothermal reference year for Holzkirchen
- Inside climate: derivation of the outside climate according to EN 15026 for the living room with ordinary allocation
- Possible shadowing has not been taken into account

b) EW_ETICS with wood-fibre insulation board



Construction build-up:
(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[4] (2006/673/EC) B-s1, d0[4] (2006/673/EC)
2	Vapour retarder layer	≥ 0,2	EN 13984	E
3.1	Particle board alternative OSB boardDensity ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	> 9,5	ETA 03/0050	A2-s1, d0[5]
4	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5	Mineral wool	≥ 90	EN 13162	A1
6	Wood-fibre insulation board	≥ 40	the whole system ETA-08/0303[6]	the whole system C-s1, d0 / B-s1,d0
7	Plaster with reinforcement	> 5		
8	External plaster - Stolit K / R / MP / Effect - StoSilco K / R / MP - StoLotusan K / MP - Sto-Superlit - Sto-Nivellit + StoSilco color	2,0 up to 6,0		

4 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.
5 Proof through ETA.
6 Other ETIC-Systems, which are intended for use of timber frame buildings' walls, may as well be used. These ETIC-Systems shall be suitable for the present building kit. Further national regulations of standard of the Member States might have to be met.

Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1	Gypsum board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
3.1	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
3.2	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
6	Wood-fibre insulation board	Staple	EN14592/A1	1,55 / 110	≤ 100

Building physics characteristics

Build-up	**Thickness [mm] λ [W/mK]**						**U-Value** EN ISO 6946 **[W/m²K]**	**Vapour diffusion** EN 15026	**Weighted sound reduction index R_w [dB]**
Layer No.	**1**	**2**	**3.1**	**4**	**5**	**6**			
EW 160-80H	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	80 0,4	0.163	-	-
EW 160-100H	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	100 0,4	0,15	-	-
EW 160-120H	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	120 0,4	0,139	-	-
EW 160-140H	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	140 0,4	0,13	-	-

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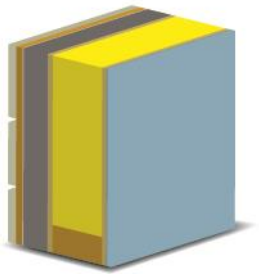
c) EW_Timber façade



Construction build-up:

(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[7] (2006/673/EC) B-s1, d0[7] (2006/673/EC)
2	Vapour retarder layer	≥ 0,2	EN 13984	E
3.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[8]
4	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5	Mineral wool	≥ 90	EN 13162	A1
6.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
6.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[8]
7	Glue: according to ETA 11/0505	approx. 1	ETA-11/0505	E
8.1	Polystyrene EPS	≥ 40, ≤ 200	EN 13163	
8.2	Wood-fibre insulation board (then without layer 6 & 7)	≥ 40	EN 13171	E
8.3	Rock wool	≥ 40	EN 13162	A1
9	Wooden lathing Density ≥ 350 kg/m^3	≥ 20 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
10	Low water vapour resistance underlay	≥ 0,5	EN 13859	E
11	Wooden cladding Density ≥ 350 kg/m^3	≥ 15	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)

[7] The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.

[8] Proof through ETA.

Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1	Gypsum board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
3.1 **6.1**	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
3.2 **6.2**	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	Ends ≤ 75 middle ≤ 150
8.2	Wood-fibre insulation board	Staple (or Drywall screw)	EN14592/A1	1,55 / 110	≤ 100
8.3	Rock wool	Staple	EN14592/A1	2,46 / 110	Only for fixing
9	Wooden lathing	Nail (or Drywall screw) (Connection with layer 6)	ETA11/0190	6 / 160	≤ 160
11	Wooden cladding	Nail (or Drywall screw)	EN 10088	3,6 / 32	-

Building physics characteristics

Build-up	**Thickness [mm]** **λ [W/mK]**							**U-Value** EN ISO 6946 **[W/m²K]**	**Vapour diffusion** EN 15026	**Weighted sound reduction index R_w [dB]**
Layer No.	**1**	**2**	**3.1**	**4**	**5**	**6.1**	**8.1**			
EW Timber facade 160-80	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	80 0,032	0,147	*	-
EW Timber facade 160-100	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	100 0,032	0,135	–	-
EW Timber facade 160-120	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	120 0,032	0,124	–	-
EW Timber facade 160-140	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	140 0,032	0,115	–	-
EW Timber facade 240-60	12,5 0,25	0,2 -	13 0,13	240 0,13	160 0,032	12,5 0,32	60 0,35	0,123	–	-

* The calculation has been done under the following conditions:
- Outside climate: hourly climate data of the hygrothermal reference year for Holzkirchen
- Inside climate: derivation of the outside climate according to EN 15026 for the living room with ordinary allocation
- Possible shadowing has not been taken into account

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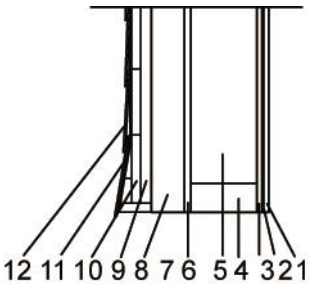
d) EW_Slate



Construction build-up:

(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[9] (2006/673/EC) B-s1, d0[9] (2006/673/EC)
2	Vapour retarder layer	≥ 0,2	EN 13984	E
3.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[10]
4	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5	Mineral wool	≥ 90	EN 13162	A1
6.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
6.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[10]
7	Glue: according to ETA 11/0505	Full-surface application	ETA-11/0505	E
8.1	Polystyrene EPS	≥ 40, ≤ 200	EN 13163	
8.2	Wood-fibre insulation board (then without layer 6 & 7)	≥ 40	EN 13171	E
8.3	Rock wool	≥ 40	EN 13162	A1
9	Wooden lathing Density ≥ 350 kg/m^3	≥ 20 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
10	Wooden cladding Density ≥ 350 kg/m^3	≥ 15	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
11	Bitumen sheet	-	EN 13707	E
12	Slate cladding*[11]	-	EN 492	see product specification

9 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.

10 Proof through ETA.

11 With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1	Gypsum board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
3.1 **6.1**	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
3.2 **6.2**	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
8.2	Wood-fibre insulation board	Staple	EN14592/A1	1,55 / 110	≤ 100
8.3	Rock wool	Staple	EN14592/A1	2,46 / 110	Only for fixing
9	Wooden lathing	Nail (or Drywall screw) (Connection with layer 6)	ETA11/0190	6 / 160	≤ 160
10	Wooden cladding	Nail (or Drywall screw)	EN 10088	3,6 / 32	-

Building physics characteristics

Build-up	**Thickness [mm]** **λ [W/mK]**							**U-Value** EN ISO 6946 **[W/m²K]**	**Vapour diffusion** EN 15026	**Weighted sound reduction index R_w [dB]**
Layer No.	**1**	**2**	**3.1**	**4**	**5**	**6.1**	**8.1**			
EW Slate 160-80	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	80 0,032	0,147	*	-
EW Slate 160-100	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	100 0,032	0,135	-	-
EW Slate 160-120	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	120 0,032	0,124	-	-
EW Slate 160-140	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	140 0,032	0,115	-	-
EW Slate 240-60	12,5 0,25	0,2 -	13 0,13	240 0,13	160 0,032	12,5 0,32	60 0,35	0,123	-	-

* The calculation has been done under the following conditions:
- Outside climate: hourly climate data of the hygrothermal reference year for Holzkirchen
- Inside climate: derivation of the outside climate according to EN 15026 for the living room with ordinary allocation
- Possible shadowing has not been taken into account

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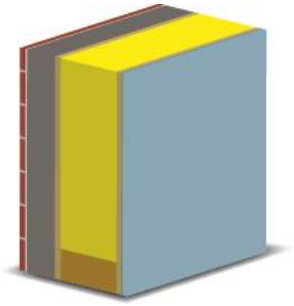
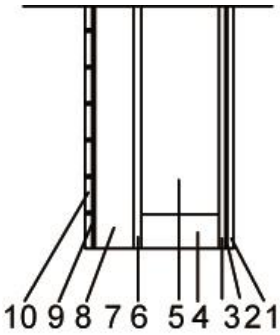
e) EW_ Brick slips





Construction build-up:

(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN-standard	Reaction to fire
1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[12] (2006/673/EC) B-s1, d0[12] (2006/673/EC)
2	Vapour retarder sheet	≥ 0,2	EN 13984	E
3.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A A2-s1, d0[13]
4	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5	Mineral wool	≥ 90	EN 13162	A1
6.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
6.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A A2-s1, d0[13]
7	Glue	Full-surface application	the whole system Z-33.47-1529	the whole system E
8	Polystyrene EPS	≥ 40, ≤ 200		
9	Plaster with reinforcement	1,8 up to 3,5		
10.1	Adhesive for brick slips*[14]	Approx. 3	EN 12004	see product specification
10.2	Brick slips*[14]	Approx. 15	EN 14411	

12 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.
13 Proof through ETA.
14 With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1	Gypsum board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
3.1 **6.1**	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
3.2 **6.2**	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150

Building physics characteristics

Build-up	**Thickness [mm] λ [W/mK]**							**U-Value** EN ISO 6946 **[W/m²K]**	**Vapour diffusion** EN 15026	**Weighted sound reduction index R_w [dB]**
Layer No.	**1**	**2**	**3.1**	**4**	**5**	**6.1**	**8**			
EW Brick slips 160-80	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	80 0,032	0,147	*	-
EW Brick slips 160-100	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	100 0,032	0,135	-	-
EW Brick slips 160-120	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	120 0,032	0,124	-	-
EW Brick slips 160-140	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	140 0,032	0,115	-	-
EW Brick slips 240-60	12,5 0,25	0,2 -	13 0,13	240 0,13	160 0,032	12,5 0,32	60 0,35	0,123	-	-

* The calculation has been done under the following conditions:
- Outside climate: hourly climate data of the hygrothermal reference year for Holzkirchen
- Inside climate: derivation of the outside climate according to EN 15026 for the living room with ordinary allocation
- Possible shadowing has not been taken into account

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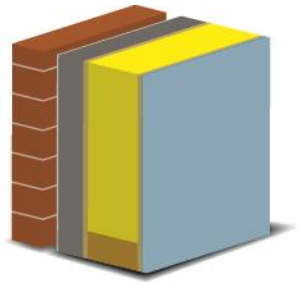
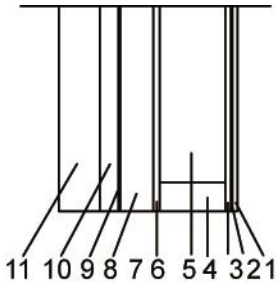
f) EW_Brick veneer wall





Construction build-up:

(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN-standard	Reaction to fire
1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[15] (2006/673/EC) B-s1, d0[15] (2006/673/EC)
2	Vapour retarder sheet	≥ 0,2	EN 13984	E
3.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[16]
4	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5	Mineral wool	≥ 90	EN 13162	A1
6.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
6.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[16]
7	Glue	Full-surface application	ETA-11/0505	E
8.1	Polystyrene EPS	≥ 40, ≤ 200		
8.2	Wood-fibre insulation board (then without layer 6 & 7)	≥ 40	EN 13171	E
8.3	Rock wool	≥ 40	EN 13162	A1
9	Low water vapour resistance underlay (only with layer 8.2)	≥ 0,5	EN 13859	E
10	Air gap*[17]	≥ 30	EN 711-1	see product specification
11	Clinker*[17]	≥ 90		

15 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.
16 Proof through ETA.
17 With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

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Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1	Gypsum board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
3.1 **6.1**	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
3.2 **6.1**	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
8.2	Wood-fibre insulation board	Staple	EN14592/A1	1,55 / 110	≤ 100
8.3	Rock wool	Staple	EN14592/A1	2,46 / 110	Only for fixing
11	Clinker	Cavity wall tie	-	-	-

Building physics characteristics

Build-up	**Thickness [mm]** **λ [W/mK]**							**U-Value** EN ISO 6946 **[W/m²K]**	**Vapour diffusion** EN 15026	**Weighted sound reduction index R_w [dB]**
Layer No.	**1**	**2**	**3.1**	**4**	**5**	**6.1**	**8.1**			
EW Clinker 160-80	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	80 0,032	0,147	*	-
EW Clinker 160-100	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	100 0,032	0,135	-	-
EW Clinker 160-120	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	120 0,032	0,124	-	-
EW Clinker 160-140	12,5 0,25	0,2 -	13 0,13	160 0,13	160 0,035	16 0,13	140 0,032	0,115	-	-
EW Clinker 240-60	12,5 0,25	0,2 -	13 0,13	240 0,13	160 0,032	12,5 0,32	60 0,35	0,123	-	-

* The calculation has been done under the following conditions:
- Outside climate: hourly climate data of the hygrothermal reference year for Holzkirchen
- Inside climate: derivation of the outside climate according to EN 15026 for the living room with ordinary allocation
- Possible shadowing has not been taken into account

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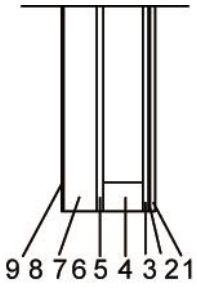
g) EW_Free standing garage



Construction build-up:
(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[18]
2	Vapour retarder sheet	≥ 0,2	EN 13984	E
3.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[18]
4	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
5.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[18]
6	Glue in accordance with the respective ETA	Full-surface application	the whole system ETA-11/0505[19]	the whole system C-s2, d0
7.1	Polystyrol EPS	≥ 40; ≤ 200		
8	Plaster with reinforcement	1,8 up to 3,5		
9	External plaster - Stolit K / R / MP / Effect - StoSilco K / R / MP - StoLotusan K / MP - Sto-Superlit	1,5 up to 6,0		
7.2	Wood-fibre insulation board (then without layer 5 & 6)	≥ 40	the whole system ETA-08/0303[19]	the whole system C-s1, d0; B-s1, d0
7.3	Rock wool	≥ 40	the whole system ETA-07/0088[19]	A1

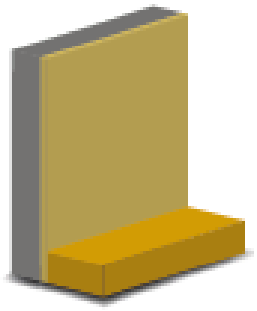
18 Proof through ETA.

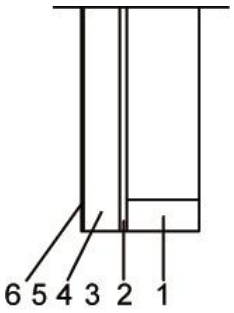
19 Other ETIC-Systems, which are intended for use of timber frame buildings' walls, may as well be used. These ETIC-Systems shall be suitable for the present building kit. Further national regulations of standard of the Member States might have to be met.

Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1	Gypsum fibre board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
3.1 **5.1**	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
3.2 **5.2**	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
7.2	Wood-fibre insulation board	Staple	EN14592/A1	1,55 / 110	≤ 100
7.3	Rock wool	Staple	EN14592/A1	2,46 / 110	Only for fixing

h) EW_Without finishings





Construction build-up:
(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
2.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[20]
3	Glue in accordance with the respective ETA	Full-surface application	the whole system ETA-11/0505[21]	the whole systems C-s2, d0
4.1	Polystyrol EPS	≥ 40		
5	Plaster with reinforcement in accordance with the respective ETA	1,8 up to 3,5		
6	External plaster - Stolit K / R / MP / Effect - StoSilco K / R / MP - StoLotusan K / MP - Sto-Superlit	1,5 up to 6,0		
4.2	Wood-fibre insulation board (then without layer 2 & 3)	≥ 40	the whole system ETA-08/0303[21]	the whole system layers 4.2, 5 and 6 C-s1,d0
4.3	Rock wool	≥ 40	the whole system ETA-07/0088[21]	A1

[20] Proof through ETA.

[21] Other ETIC-Systems, which are intended for use of timber frame buildings' walls, may as well be used. These ETIC-Systems shall be suitable for the present building kit. Further national regulations of standard of the Member States might have to be met.

Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
2.1	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
2.2	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
4.2	Wood-fibre insulation board	Staple	EN14592/A1	1,55 / 110	≤ 100
4.3	Rock wool	Staple	EN14592/A1	2,46 / 110	Only for fixing

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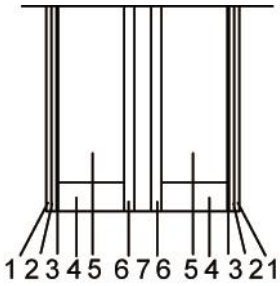
i) EW_Party wall



Construction build-up:
(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1.1	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[22]
1.2	Gypsum fire protection board	≥ 9,5	EN 520	A2-s1, d0
2	Vapour retarder sheet	≥ 0,2	EN 13984	E
3.1	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[22]
3.2	Gypsum fire protection board	≥ 9,5	EN 520	A2-s1, d0
3.3	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
4	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5	Mineral wool	≥ 90	EN 13162	A1
6.1	Gypsum fibre board (depending on the wall thickness possibly double)	≥ 9,5	ETA 03/0050	A2-s1, d0[22]
6.2	Gypsum fire protection board	≥ 9,5	EN 520	A2-s1, d0
7	Air gap	-	-	-
	Further build-up mirror- inverted! Compare draft			

[22] Proof through ETA.

Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1.1 **1.2**	Gypsum fibre board Gypsum fire protection board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
3.1 **3.2** **6.1** **6.2**	Gypsum fibre board Gypsum fire protection board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150

Building physics characteristics

Build-up	Thickness [mm] λ [W/mK]						U-Value EN ISO 6946 [W/m²K]	Vapour diffusion EN 15026	Weighted sound reduction index R_w [dB]
Layer no.	**1.1**	**2.2**	**3.1**	**4**	**5**	**6.2**			
PW 160 (1 element)	12,5 0,32	0,2 -	12,5 0,32	160 0,13	160 0,035	25 0,25	-	-	65

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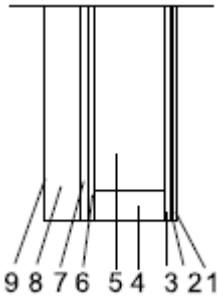
j) EW_Party wall (free standing and adjoining)



Construction build-up:

(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Gypsum fire protection board	≥ 9,5	EN 520	A2-s1, d0
2	Vapour retarder sheet	≥ 0,2	EN 13984	E
3.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[23]
4	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5	Mineral wool	≥ 40	EN 13162	A1
6.1	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[23]
6.2	Gypsum fire protection board	≥ 18	EN 520	A2-s1, d0
7.1	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[23]
7.2	Gypsum fire protection board	≥ 18	EN 520	A2-s1, d0
	Glue according to	Full-surface application	the whole system ETA 07/0088[24]	the whole system C-s2,d0
8	Rock wool	≥ 40		
9	Plaster with reinforcement	approx. 3,5		

23 Proof through ETA.

24 Other ETIC-Systems, which are intended for use of timber frame buildings' walls, may as well be used. These ETIC-Systems shall be suitable for the present building kit. Further national regulations of standard of the Member States might have to be met.

Fixing devices:

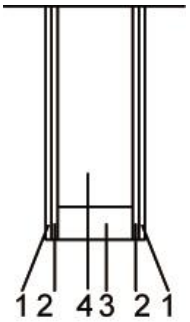
No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1	Gypsum fire protection board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
3.1	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
3.2 6.1 7.1	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
6.2 7.2	Gypsum fire protection board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
8	Rock wool	Staple (or Drywall screw)	EN14592/A1	2,46 / 110	Only for fixing

Building physics characteristics

Build-up	**Thickness [mm] λ [W/mK]**								**U-Value** EN ISO6946 **[W/m²K]**	**Vapour diffusion** EN 15026	**Weighted sound reduction index R_w [dB]**
Layer No.	**1**	**2**	**3.1**	**4**	**5**	**6**	**7**	**8**			
PW 160-80	12,5 0,25	0,2 -	12,5 0,32	160 0,13	160 0,035	12,5 0,32	12,5 0,32	80 0,4	0,156	*	-

* The calculation has been done under the following conditions:
- Outside climate: hourly climate data of the hygrothermal reference year for Holzkirchen
- Inside climate: derivation of the outside climate according to EN 15026 for the living room with ordinary allocation
- Possible shadowing has not been taken into account

k) IW_FingerHaus current standard internal wall



Construction build-up:
(from right to left side)

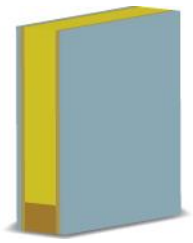
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Gypsum board Density ≥ 600 kg/m^3	12,5	EN 520	A2-s1, d0[25] (2006/673/EC) B-s1, d0[25] (2006/673/EC)
2.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[26]
3	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
4	Mineral wool	≥ 60	EN 13162	A1
2.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[26]
1	Gypsum board Density ≥ 600 kg/m^3	12,5	EN 520	A2-s1, d0[25] (2006/673/EC) B-s1, d0[25] (2006/673/EC)

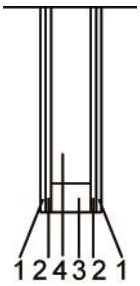
25 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.
26 Proof through ETA.

Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1	Gypsum board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
2.1	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
2.2	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150

I) IW_General (& chimney enclosure wall)





Construction build-up:
(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1.1	Gypsum board Density ≥ 600 kg/m^3	≥ 9.5	EN 520	A2-s1, d0[27] (2006/673/EC) B-s1, d0[27] (2006/673/EC)
1.2	Gypsum fibre board	≥ 9.5	ETA 03/0050	A2-s1, d0[28]
2.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[28]
3	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
4	Mineral wool	≥ 30	EN 13162	A1
2.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	≥ 9,.5	ETA 03/0050	A2-s1, d0[28]
1.1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[27] (2006/673/EC) B-s1, d0[27] (2006/673/EC)
1.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[28]

27 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.
28 Proof through ETA.

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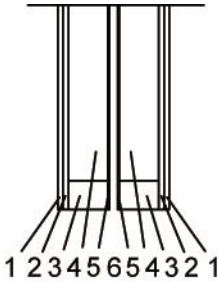
Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1.1	Gypsum board Density ≥ 600 kg/m^3	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
1.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
2.2	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
2.1	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150

m) IW_Apartment party wall



Construction build-up:
(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1.1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[29] (2006/673/EC) B-s1, d0[29] (2006/673/EC)
1.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[30]
2.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[30]
3	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
4	Mineral wool	≥ 90	EN 13162	A1
5	Low water vapour resistance underlay	≥ 0,5	EN 13859	E
6	Air	approx. 20	--	--
	Further build-up mirror-inverted! Compare draft			

29 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.
30 Proof through ETA.

Fixing devices:					
No.	**Construction product**	**Type**	**EN-standard**	**Dimensions Ø / length (mm)**	**Spacing (mm)**
1.1	Gypsum board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
1.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
2.1	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
2.2	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150

Building physics characteristics								
Build-up	**Thickness [mm] λ [W/mK]**							**Weighted sound reduction index R_w [dB]**
Layer No.	**1.2**	**2.2**	**3**	**4**	**5**	**6**	mirror-inverted	
Ap-PW (1 part of the wall)	12,5	13	96	96	>0,1	≥20		63 test report No. 17237119 /V03

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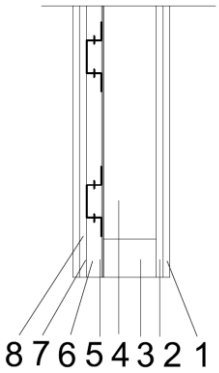
n) IW_Apartment party wall (sound insulation wall)



Construction build-up:

(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1.1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[31] (2006/673/EC) B-s1, d0[31] (2006/673/EC)
1.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[32]
2.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[32]
3	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
4	Mineral wool	≥ 30	EN 13162	A1
5	Low water vapour resistance underlay	≥ 0,5	EN 13859	E
6	Resilient bars	≥ 20 / ≥ 50	EN 14195	A2
7.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
7.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[32]
8.1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[31] (2006/673/EC) B-s1, d0[31] (2006/673/EC)
8.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[32]

31 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.

32 Proof through ETA.

Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1.1	Gypsum board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
1.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
2.1	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
2.2	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
6	Resilient bars	Drywall screw	EN 14566/A1	3,9 / 30	2 items ≤ 625
7.1	Particle board alternative OSB board	Drywall screw	EN 14566/A1	3,9 / 30	≤ 250
7.2	Gypsum fibre board	Drywall screw	EN 14566/A1	3,9 / 30	≤ 250
8.1	Gypsum board	Drywall screw	EN 14566/A1	3,9 / 30	≤ 250
8.2	Gypsum fibre board	Drywall screw	EN 14566/A1	3,9 / 30	≤ 250

Building physics characteristics

Build-up	**Thickness [mm] λ [W/mK]**								**Weighted sound reduction index R_w [dB]**
Layer No.	**1.1**	**2.1**	**3**	**4**	**5**	**6**	**7.1**	**8.1**	
E-PW	12,5	13	96	96	>0,1	27	13	12,5	58

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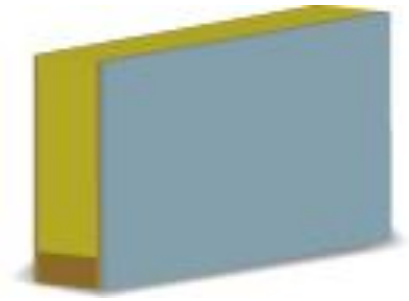
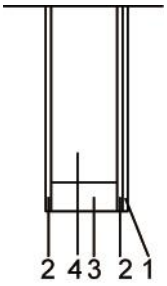
o) IW_Prewall for washbasin/ toilet & kneewall of purlin roof





Construction build-up:
(from the inside outwards)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1.1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[33] (2006/673/EC) B-s1, d0[33] (2006/673/EC)
1.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[34]
2.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[34]
3	Timber structure - Stud Density ≥ 350 kg/m^3	≥ 40 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
	- Sole plate Density ≥ 350 kg/m^3	≥ 40 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
4	Mineral wool	≥ 30	EN 13162	A1
2.1	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[34]

[33] The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.
[34] Proof through ETA.

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Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1.1	Gypsum board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
1.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14566/A1	0,92 / 25	≤ 150
2.2	Gypsum fibre board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150
2.1	Particle board alternative OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	ends ≤ 75 middle ≤ 150

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p) Windows and Doors

Windows and external doors have been tested according to the provisions stated in EN 14351-1. The properties are given in the following table according to that standard. The works may have roof windows; the properties of these shall comply with the local provisions.

Characteristics						
Type of Windows/Doors	**F1/T1 (1.1)**	**F2/T2 (1.2)**	**F3/T3 (3.1)**	**(3.2)**	**T5 (2.1)**	**T6 (2.2)**
	Windows / doors with fixed mullions / crossbars	Windows / doors with front plate	Entrance doors	Lifting- sliding doors	PSK-doors	Folding- sash windows and doors
BWR1 Mechanical resistance and stability						
Resistance to wind test pressure (Pa)	C3/B3	C3/B3	C3/B3	C3/B3	C3/B3	C2/B2
Resistance to snow - and permanent load	npd	npd	npd	npd	npd	npd
BWR2 Safety in case of fire						
Reaction to fire	npd	npd	npd	npd	npd	npd
External fire performance	npd	npd	npd	npd	npd	npd
BWR3 Hygiene, health and environment						
Water tightness Non- shielded (A) Test pressure (Pa)	7A	5A	5A	5A	5A	4A
Water tightness Shielded (B) Test pressure (Pa)	7A	5A	5A	5A	5A	4A
Content and/or release of dangerous substances	npd	npd	npd	npd	npd	npd
BWR4 Safety in use						
Impact resistance, drop height (mm)	2	2	2	2	2	2
Glass thickness 6 mm or special glass [35]	npd	npd	npd	npd	npd	npd
Load- bearing capacity of safety devices	npd	npd	npd	npd	npd	npd
BWR5 Protection against noise						
Protection against noise Weighted sound reduction index Rw (C;C_{tr}) (dB)	npd	npd	npd	npd	npd	npd
BWR6 Energy economy and heat retention						
Thermal transmittance UW W/(m^2K)	1	1	1.1	1	1	1.5
Radiation attribute Solar factor g	npd	npd	npd	npd	npd	npd
Radiation attribute Light transmittance τ_v	npd	npd	npd	npd	npd	npd
Air permeability (max. test pressure Pa)	4	3	2	4	4	3

[35] Finnish regulations contain safety provisions for windows. 6 mm glass or safety glass shall be used when there is a risk for falling through the window

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2) Floor / Ceiling (FC)

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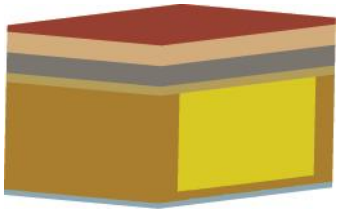
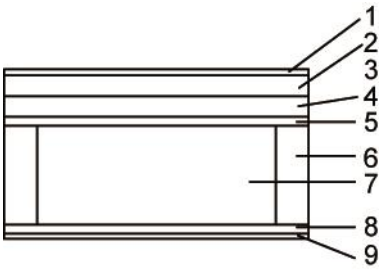
a) FC_FingerHaus standard floor/ceiling





Construction build-up:

(from the top down)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Flooring as chosen by owner*[36]	--		
2.1	Cementitious screed	≥ 40	EN 13813	E(2010/85/EG)
2.2	Anhydrite screed	≥ 40	EN 13813	E(2010/85/EG)
3	Separating sheet	approx. 0,2	EN 13859	E
4.1	Polystyrene rigid foam board (multi-layered)	≥ 30	EN 13163	E
4.2	Rock wool, Mineral wool	≥ 30	EN 13162	A1
4.3	Wood fibre	≥ 30	EN 13171	E
5	Particle board alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
6	Timber structure - Beam Density ≥ 350 kg/m^3	≥ 60 / ≥ 240	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
7	Mineral wool	≥ 120	EN 13162	A1
8	Timber structure	≥ 22 / 70	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
9.1	Gypsum board Density ≥ 600 kg/m^3	≥ 12,5	EN 520	A2-s1, d0[37] (2006/673/EC) B-s1, d0[37](2006/673/EC)
9.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[38]

36 With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

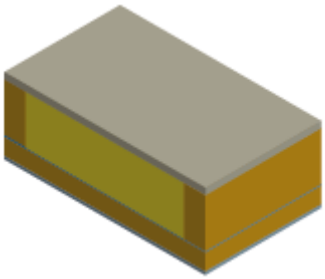
37 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.

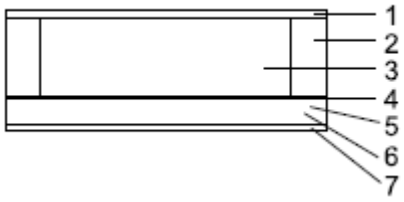
38 Proof through ETA.

Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
5	Particle board alternative OSB board	Staple (or nail)	EN 14592/A1	1,55 / 45	-
8	Timber structure - support for planking	Staple (or nail)	EN 14592/A1	1,55 / 45	-
9.1	Gypsum board	Drywall screw (or Staple)	EN 14566/A1	3,9 / 30	≤ 170
9.2	Gypsum fibre board	Drywall screw (or Staple)	EN 14566/A1	3,9 / 30	≤ 170

b) FC_External ceiling or floor / collar beam ceiling





Construction build-up:
(from the top down)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Timber cladding Density ≥ 350 kg/m^3	≥ 20 / ≥ 80	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
2	Timber structure - Beam Density ≥ 350 kg/m^3	≥ 20 / ≥ 180	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
3	Mineral wool	≥ 40	EN 13162	A1
4	Vapour retarder sheet	≥ 0,2	EN 13984	E
5	Timber substructure Density ≥ 350 kg/m^3	≥ 20 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
6	Mineral wool	≥ 40	EN 13162	A1
7.1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[39] (2006/673/EC) B-s1, d0[39] (2006/673/EC)
7.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[40]

39 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.
40 Proof through ETA.

Fixing devices:

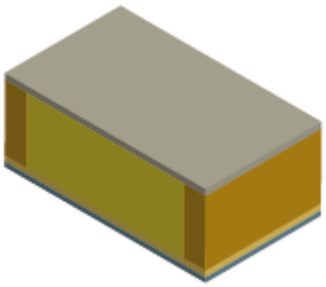
No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1	Timber	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
7.1	Gypsum board	Drywall screw (or Staple)	EN 14566/A1	3,9 / 30	≤ 170
7.2	Gypsum fibre board	Drywall screw (or Staple)	EN 14566/A1	3,9 / 30	≤ 170

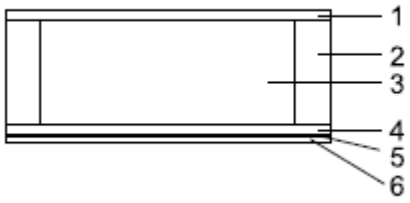
Building physics characteristics

Build-up	**Thickness [mm] λ [W/mK]**							**U-Value** EN ISO 6946 **[W/m²K]**	**Vapour diffusion** EN 15026	**Weighted sound reduction index R_w [dB]**
Layer No.	**1**	**2**	**3**	**4**	**5**	**6**	**7.1**			
FC- collar beam 180-60	22 -	180 0,13	180 0,035	0,2 -	60 0,13	60 0,035	12,5 0,25	0,177	*	-
FC- collar beam 200-60	22 -	200 0,13	200 0,035	0,2 -	60 0,13	60 0,035	12,5 0,25	0,165	*	-
FC- collar beam 220-60	22 -	220 0,13	220 0,035	0,2 -	60 0,13	60 0,035	12,5 0,25	0,155	*	-
FC- collar beam 240-60	22 -	240 0,13	240 0,035	0,2 -	60 0,13	60 0,035	12,5 0,25	0,146	*	-
FC- collar beam 260-60	22 -	260 0,13	260 0,035	0,2 -	60 0,13	60 0,035	12,5 0,25	0,138	*	-

* The calculation has been done under the following conditions:
- Outside climate: hourly climate data of the hygrothermal reference year for Holzkirchen
- Inside climate: derivation of the outside climate according to EN 15026 for the living room with ordinary allocation
- Possible shadowing has not been taken into account

c) FC_External ceiling or floor





Construction build-up:
(from the top down)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Timber cladding Density ≥ 350 kg/m^3	≥ 20 / ≥ 80	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
2	Timber structure - Beam Density ≥ 350 kg/m^3	≥ 40 / ≥ 180	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
3	Mineral wool	≥ 40	EN 13162	A1
4	Open formwork Density ≥ 350 kg/m^3	≥ 20 / ≥ 50	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5	Vapour retarder sheet	≥ 0,2	EN 13984	E
6.1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[41] (2006/673/EC) B-s1, d0[41] (2006/673/EC)
6.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[42]

41 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.
42 Proof through ETA.

Fixing devices

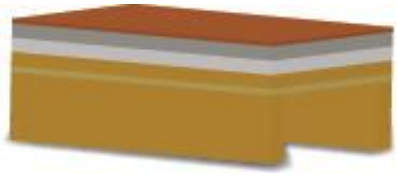
No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1	Timber cladding	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
4	Open formwork	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
6.1	Gypsum board	Drywall screw (or Staple)	EN 14566/A1	3,9 / 30	≤ 170
6.2	Gypsum fibre board	Drywall screw (or Staple)	EN 14566/A1	3,9 / 30	≤ 170

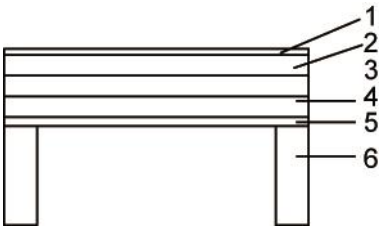
Building physics characteristics

Build-up	**Thickness [mm] λ [W/mK]**						**U-Value** EN ISO 6946 **[W/m²K]**	**Vapour diffusion** EN 15026	**Weighted sound reduction index R_w [dB]**
Layer No.	**1**	**2**	**3**	**4**	**5**	**6.1**			
External ceiling 240	22 0,13	240 0,13	240 0,035	0,2 -	22 0,13	12,5 0,25	0,193	*	-

* The calculation has been done under the following conditions:
- Outside climate: hourly climate data of the hygrothermal reference year for Holzkirchen
- Inside climate: derivation of the outside climate according to EN 15026 for the living room with ordinary allocation
- Possible shadowing has not been taken into account

d) FC_Open wooden joist floor/ceiling





Construction build-up:
(from the top down)

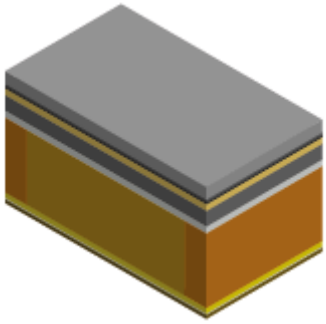
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Flooring as chosen by owner*[43]	--		
2.1	Cementitious screed	≥ 30	EN 13813	E(2010/85/EG)
2.2	Anhydrite screed	≥ 30	EN 13813	E(2010/85/EG)
3	Separating sheeting	approx. 0,2	EN 13859	E
4.1	Polystyrene rigid foam board (multi-layered)	≥ 30	EN 13163	E
4.2	Rockwool	≥ 30	EN 13163	E
4.3	Wood fibre	≥ 30	EN 13171	E
5.1	Particle board, alternative: OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
5.2	Matchboards Density ≥ 350 kg/m^3	≥ 15	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
6	Timber structure - Beam Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)

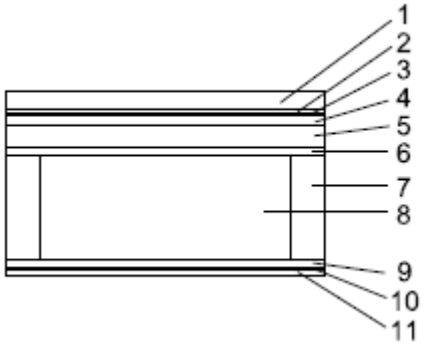
Fixing devices

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
5.1	Particle board, alternative: OSB board	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
5.2	Matchboards	Staple (or Nails)	EN 14592/A1	1,55 / 45	-

[43] With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

e) FC_Ceiling under balcony (over heated room)





Construction build-up:

(from the top down)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Balcony flooring*[44]	--		
2	Substructure*[43]	--		
3	Waterproofing sheet	approx. 2	EN 13859	E
4	Rough tongue & groove boards	≥ 18 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5.1	Timber sloped wedges Density ≥ 350 kg/m^3	≥ 1 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5.2	Sloped insulation (then without layer 4 and 5.1)	≥ 1 / ≥ 90	EN 13162	A1
6	Particle board, alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
7	Timber structure - Beam Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
8	Mineral wool	≥ 90	EN 13162	A1
9	Timber structure Density ≥ 350 kg/m^3	≥ 20 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
10	Vapour barrier sheet	≥ 0.2	EN 13984	E
11.1	Gypsum board Density ≥ 600 kg/m^3	≥ 9.5	EN 520	A2-s1, d0[45] (2006/673/EC) B-s1, d0[45](2006/673/EC)
11.2	Gypsum fibre board	≥ 9.5	ETA 03/0050	A2-s1, d0[46]

44 With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

45 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.

46 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.
Proof through ETA.

Fixing devices:

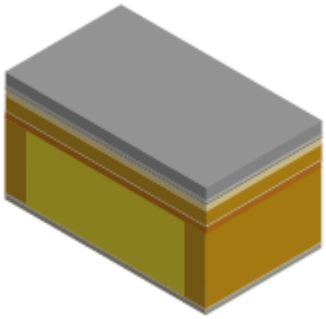
No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
4	Rough tongue & groove boards	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
5.1	Timber sloped wedges	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
6	Particle board, alternative OSB board	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
9	Timber structure	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
11.1	Gypsum board	Drywall screw (or Staple)	EN 14566/A1	3,9 / 30	≤ 170
11.2	Gypsum fibre board	Drywall screw (or Staple)	EN 14566/A1	3,9 / 30	≤ 170

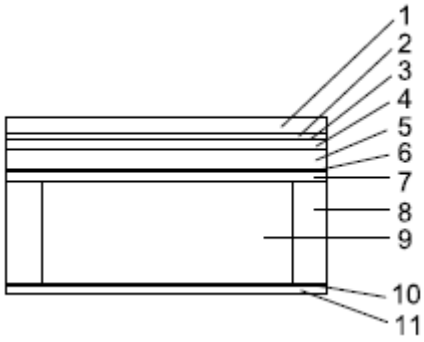
Building physics characteristics

Build-up	**Thickness [mm] λ [W/mK]**									**U-Value** EN ISO 6946 **[W/m²K]**	**Vapour diffusion** EN 15026	**Weighted sound reduction index R_w [dB]**
Layer No.	**3**	**4**	**5.1**	**6**	**7**	**8**	**9**	**10**	**11.1**			
Balcony over heated room 240	>0,1 -	22 0,13	-	22 0,13	240 0,13	240 0,035	22 0,13	0,2 -	12,5 0,25	0,191	*	-

* The calculation has been done under the following conditions:
- Outside climate: hourly climate data of the hygrothermal reference year for Holzkirchen
- Inside climate: derivation of the outside climate according to EN 15026 for the living room with ordinary allocation
- Possible shadowing has not been taken into account

f) C_Ceiling under balcony (cantilever)





Construction build-up:
(from the top down)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Flooring *[47]	--		
2	Substructure*[47]	--		
3	Sheets for waterproofing	approx. 0.2	EN 13859	E
4	Rough tongue & groove boards	≥ 18 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5.1	Timber slope wedges Density ≥ 350 kg/m^3	≥ 1 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2007/348/EC)
5.2	Sloped insulation (then without layer 4 and 5.1)	≥ 1 / ≥ 90	EN 13162	A1
6	Underlay	--	EN13859	E
7	Particle board, alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
8	Timber structure Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN338 EN14081	D-s2, d0 (2003/593/EG)
9	Mineral wool	≥ 40	EN 13162	A1
10	Underlay	--	EN13859	E
11.1	Matchboards Density ≥ 350 kg/m^3	≥ 15	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
11.2	Lightweight concrete boards	≥ 12,5	ETA-07/0087[48]	A1

[47] With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

[48] Other lightweight concrete boards, which are intended for use of timber frame building ceilings, may as well be used. These lightweight concrete boards shall be suitable for the present building kit. Further regulations might have to be met.

Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
4	Rough tongue & groove boards	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
5.1	Timber slope wedges Density ≥ 350 kg/m^3	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
7	Particle board, alternative OSB board	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
11.1	Matchboards	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
11.2	Lightweight concrete boards	Drywall screw (or Staple)	-	-	-

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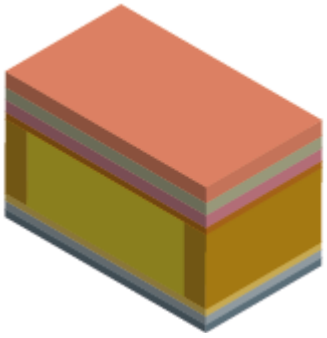
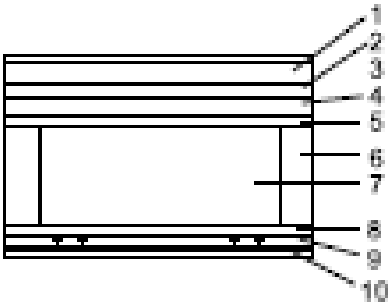
g) FC_Ceiling or floor with spring rods (resilient bars)





Konstruktionsaufbau:

(von oben nach unten)

Nr.	Bauprodukt	Abmessungen [mm]	EN-Standard	Brandverhalten
1	Flooring as chosen by owner*[49]	--		
2.1	Cementitious screed	≥ 30	EN 13813	E(2010/85/EG)
2.2	Anhydrite screed	≥ 30	EN 13813	E(2010/85/EG)
3	Separating sheeting	approx. 0.2	EN 13859	E
4.1	Polystyrene rigid foam board (multi-layered)	≥ 30	EN 13163	E
4.2	Rockwool	≥ 30	EN 13163	E
4.3	Wood fibre	≥ 30	EN 13171	E
5	Particle board, alternative OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EG)
6	Timber structure - Beam Density ≥ 350 kg/m^3	≥ 40 / ≥ 200	EN 338 EN 14081-1	D-s2, d0 (2003/593/EG)
7	Mineral wool	≥ 40	EN 13162	A1
8	Open formwork Density ≥ 350 kg/m^3	≥ 20 / ≥ 50	EN 338 EN 14081-1	D-s2, d0 (2003/593/EG
9	Spring rods	27 (60/70)	EN 14195	A2-s1, d0[50] (2006/673/EG) B-s1, d0[50] (2006/673/EG)
10.1	2x Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	
10.2	2x Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[51]

[49] With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

[50] The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.

[51] Proof through ETA.

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Fixing devices

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
5	Particle board, alternative OSB board	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
8	Open formwork	Staple (or Nails)	EN 14592/A1	1,55 / 45	-
9	Spring rods	TPS-Fedserclip	EN 13964	4,2 / 35	-
10.1	Gypsum board	Drywall screw (or staple)	EN 14566/A1	3,9 / 30	≤ 170
10.2	Gypsum fibre board	Drywall screw (or staple)	EN 14566/A1	3,9 / 30	≤ 170

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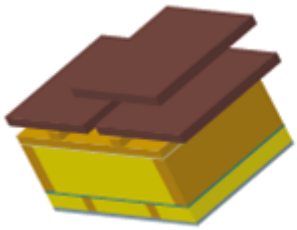
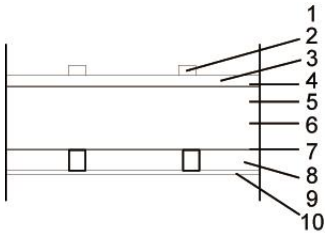
3) Roof (RF)

a) RF_FingerHaus current standard roof





Construction build-up:
(from the top down)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Roofing*[52]	--		
2	Cross joists	≥ 30/ ≥ 50	EN 338	D-s2, d0 (2003/593/EC)
3	Counter lathing	≥ 20/ ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
4	Underlay	--	EN 13859	E
5	Timber substructure Density ≥ 350 kg/m^3	≥ 60/ ≥ 180	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
6	Mineral wool	>180	EN 13162	A1
7	Vapour retarder sheet	0.2	EN 13984	E
8	Timber structure Density ≥ 350 kg/m^3	≥ 47/ ≥ 60	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
9	Mineral wool	≥ 60	EN 13162	A1
10.1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[53] (2006/673/EC) B-s1, d0[53] (2006/673/EC)
10.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[54]

[52] With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

[53] The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.

[54] Proof through ETA

Fixing devices:

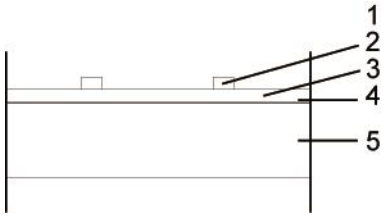
No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
2	Cross joists	Drywall screw or nails	EN 14592/A1	2,5 x 65	2 each support
3	Counter lathing	Drywall screw or nails	EN 14592/A1	2,5 x 65	≤ 200
8	Timber substructure	Drywall screw or nails	EN 14592/A1	3,1 x 90	2 each rafter
10.1	Gypsum board	Drywall screw (or staple)	EN 14566/A1	3,9 / 30	≤ 170
10.2	Gypsum fibre	Drywall screw (or staple)	EN 14566/A1	3,9 / 30	≤ 170

Building physics characteristics

Build-up	**Thickness [mm]** **λ [W/mK]**						**U-Value** EN ISO 6946 **[W/m²K]**	**Vapour diffusion** EN 15026	**Weighted sound reduction index R_w [dB]**
Layer No.	**5**	**6**	**7**	**8**	**9**	**10**			
RF-18	180 0,13	180 0,035	0,2 -	60 0,13	60 0,035	12,5 0,25	0,178	*	-
RF-20	200 0,13	200 0,035	0,2 -	60 0,13	60 0,035	12,5 0,25	0,167	*	-
RF-22	220 0,13	220 0,035	0,2 -	60 0,13	60 0,035	12,5 0,25	0,156	*	
RF-24	240 0,13	240 0,035	0,2 -	60 0,13	60 0,035	12,5 0,25	0,147	*	-
RF-26	260 0,13	260 0,035	0,2 -	60 0,13	60 0,035	12,5 0,25	0,139	*	-

* The calculation has been done under the following conditions:
- Outside climate: hourly climate data of the hygrothermal reference year for Holzkirchen
- Inside climate: derivation of the outside climate according to EN 15026 for the living room with ordinary allocation
- Possible shadowing has not been taken into account

b) RF_Non-habitable space



Construction build-up:
(from the top down)

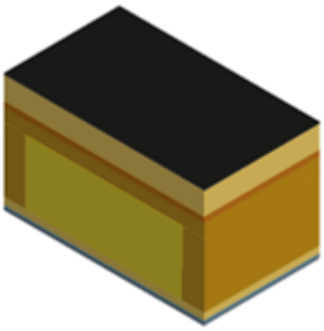
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Roofing*[55]	--		
2	Cross joists	≥ 20 / ≥ 30	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
3	Counter lathing	≥ 20 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
4	Underlay	--	EN 13859	E
5	Timber structure - Beam Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)

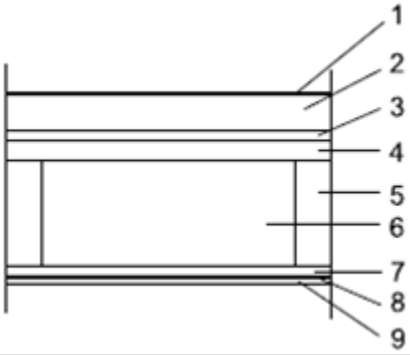
Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
2	Cross joists	Nails (or Drywall screw)	EN 14592/A1	2,5 x 65	2 each support
3	Counter lathing	Nails (or Drywall screw)	EN 14592/A1	2,5 x 65	≤ 200
5	Timber structure	Drywall screw or nails	EN 14592/A1	3,1 x 90	2 each rafter

55 With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

c) RF flat roof





Construction build-up:

(from the top down)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Roof waterproofing	1.5	EN 13956	E
2	Sloped insulation	40 – 200	EN 13163	B1
3	Particle board, alternative: OSB board Density ≥ 600 kg/m^3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
4	Timber structure - Beam Density ≥ 350 kg/m^3 (ventilation)	≥ 40 / ≥ 60	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
5	Timber structure - Beam Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
6	Mineral wool	≥ 20	EN 13162	A1
7	Timber structure - support for planking	≥ 20 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EC)
8	Vapour retarder sheet	0.2	EN 13984	E
9.1	Gypsum board Density ≥ 600 kg/m^3	≥ 9.5	EN 520	A2-s1, d0[56] (2006/673/EC) B-s1, d0[56](2006/673/EC)
9.2	Gypsum fibre board	≥ 9.5	ETA 03/0050	A2-s1, d0[57]

56 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.

57 Proof through ETA.

Fixing devices:

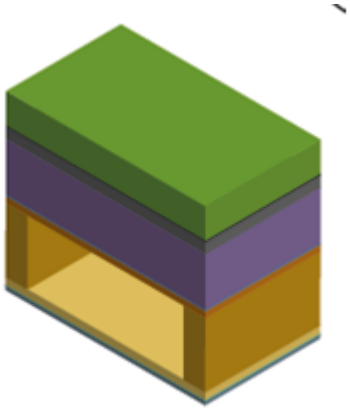
No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
3	Particle board, Alternative: OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	-
7	Timber structure - support for planking	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	-
9.1	Gypsum board	Drywall screw (or staple)	EN 14566/A1	3,9 / 30	≤ 170
9.2	Gypsum fibre board	Drywall screw (or staple)	EN 14566/A1	3,9 / 30	≤ 170

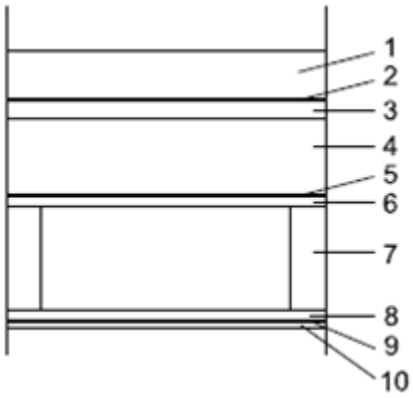
Building physics characteristics

Build-up	**Thickness [mm] λ [W/mK]**									**U-Value** EN ISO 6946 **[W/m²K]**	**Vapour diffusion** EN 15026	**Weighted sound reduction index R_w [dB]**
Layer No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9.1**			
Flat roof 240	>0,1 -	>40 0,035	22 0,13	47 -	240 0,13	240 0,035	22 0,13	0,2 -	12,5 0,25	0,191	*	-

* The calculation has been done under the following conditions:
- Outside climate: hourly climate data of the hygrothermal reference year for Holzkirchen
- Inside climate: derivation of the outside climate according to EN 15026 for the living room with ordinary allocation
- Possible shadowing has not been taken into account

d) RF flat roof with revegetation





Construction build-up:

(from the top down)

No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Composition of roof greening*[58] (Vegetation, vegetation base course, fleece, drainage, waterproofing)	approx. 100	-	-
2	Roof waterproofing	1,5	EN 13956	E
3	Sloped insulation	40 – 200	EN 13163	B1
4	Insulation on top	40 – 200	EN 13163	B1
5	Vapour retarder sheet	0,4 – 2,0	EN 13956	B2
6	Particle board, alternative: OSB board Density ≥ 600 kg/m3	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EG)
7	Timber structure - Beam Density ≥ 350 kg/m^3	≥ 40 / ≥ 90	EN 338 EN 14081-1	D-s2, d0 (2003/593/EG)
8	Timber structure - support for planking	≥ 20 / ≥ 40	EN 338 EN 14081-1	D-s2, d0 (2003/593/EG)
9	Sheets for air tightness	≥ 0,2	EN 13984	E
10.1	Gypsum board Density ≥ 600 kg/m^3	≥ 9,5	EN 520	A2-s1, d0[59] (2006/673/EG) B-s1, d0[55] (2006/673/EG)
10.2	Gypsum fibre board	≥ 9,5	ETA 03/0050	A2-s1, d0[60]

58 With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

59 The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.

60 Proof through ETA.

Fixing devices:

No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
6	Particle board, alternative: OSB board	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	-
8	Timber structure - support for planking	Staple (or Drywall screw)	EN14592/A1	1,55 / 45	-
10.1	Gypsum board	Drywall screw (or staple)	EN 14566/A1	3,9 / 30	≤ 170
10.2	Gypsum fibre board	Drywall screw (or staple)	EN 14566/A1	3,9 / 30	≤ 170

Building physics characteristics

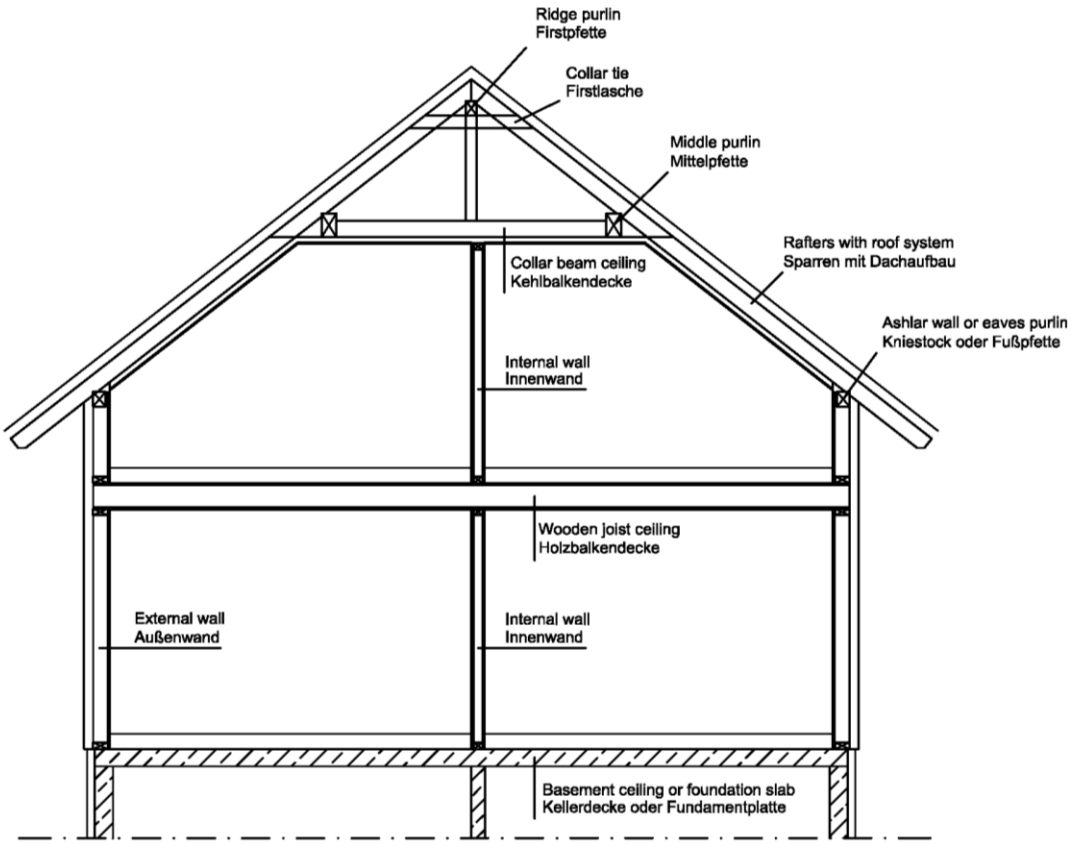
Build-up	**Thickness [mm] λ [W/mK]**									**U-Value** EN ISO 6946 **[W/m²K]**	**Vapour diffusion** EN 15026	**Weighted sound reduction index R_w [dB]**
Layer No.	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10.1**			
Flat roof+ vegation 240	>0,1 -	>40 0,035	160 0,035	>0,4	22 0,13	240 0,13	22 0,13	0,2 -	12,5 0,25	0,154	*	-

* The calculation has been done under the following conditions:
- Outside climate: hourly climate data of the hygrothermal reference year for Holzkirchen
- Inside climate: derivation of the outside climate according to EN 15026 for the living room with ordinary allocation
- Possible shadowing has not been taken into account

Deutsches Institut für Bautechnik DIBt

	FINGERHAUS	Detail-No.: / Detail-Nr.:	01
	Building cross-section Gebäudequerschnitt	Drawn by : / Erstellt von :	H.Seibert
		Drawn on : / Erstellt am :	03/08/2011

Annex B Construction details



The loadbearing connections are only shown generally. They shall be designed according to technical regulations and executed according to structural design.

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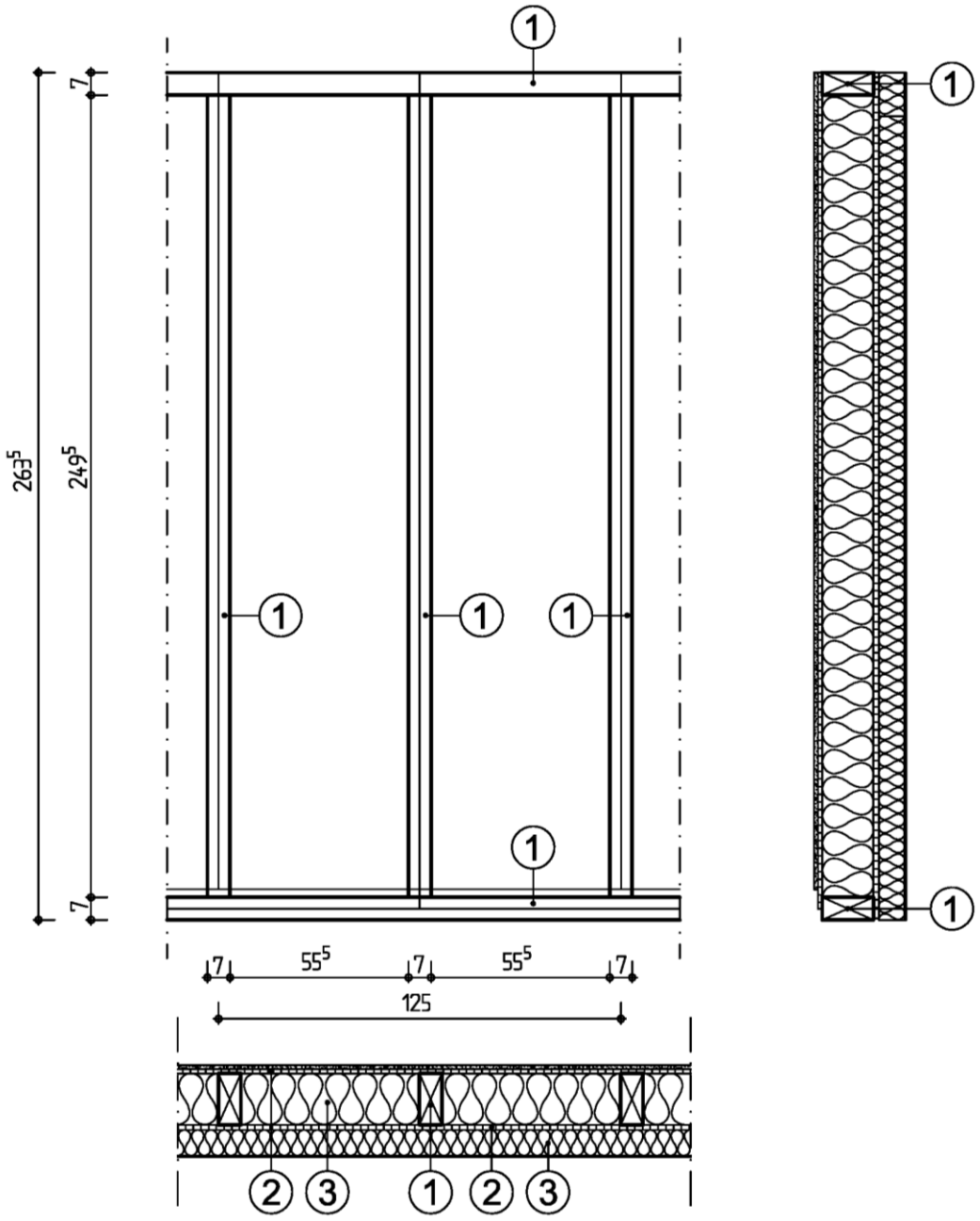
FINGERHAUS

Detail-No.: / Detail-Nr.: 02

Standard external wall element
Standard Außenwandelement

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011



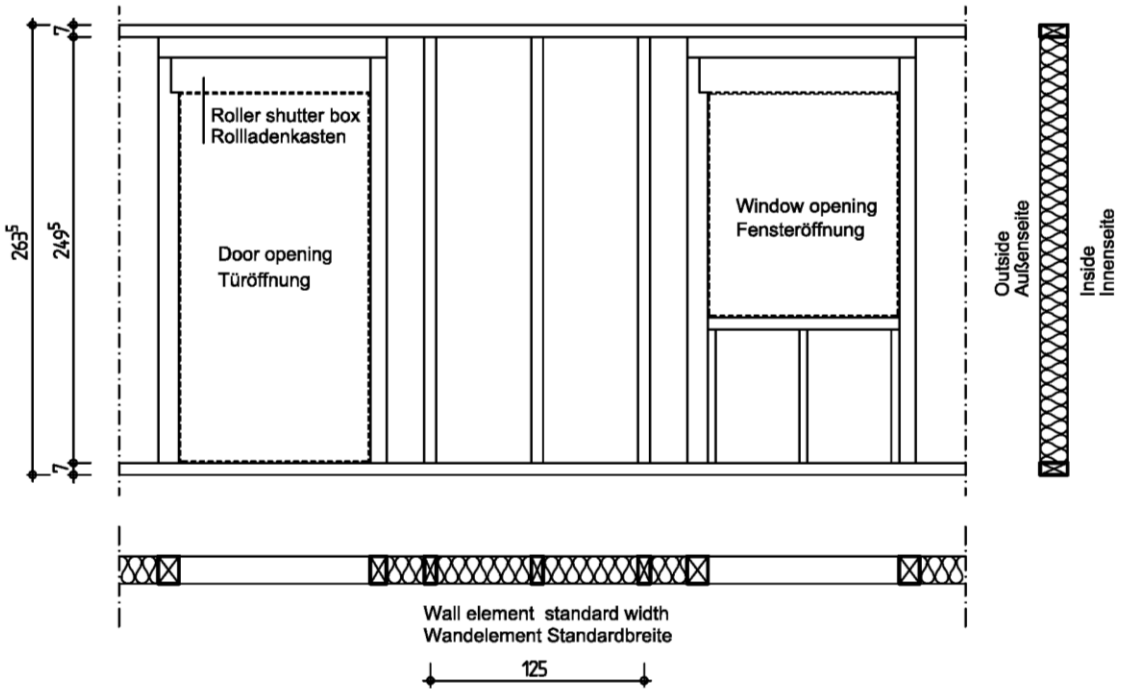
1 = Framing timber (timber studs)
Rahmenhölzer

2 = Wall panel (stiffening panel)
Aussteifungsplatte

3 = Thermal and sound insulation
Wärme- und Schalldämmung

Deutsches Institut für Bautechnik DIBt

	FINGERHAUS	Detail-No.: / Detail-Nr.:	03
	View of external wall element Ansicht Außenwandelement	Drawn by : / Erstellt von :	H.Seibert
		Drawn on : / Erstellt am :	03/08/2011



Deutsches Institut für Bautechnik DIBt

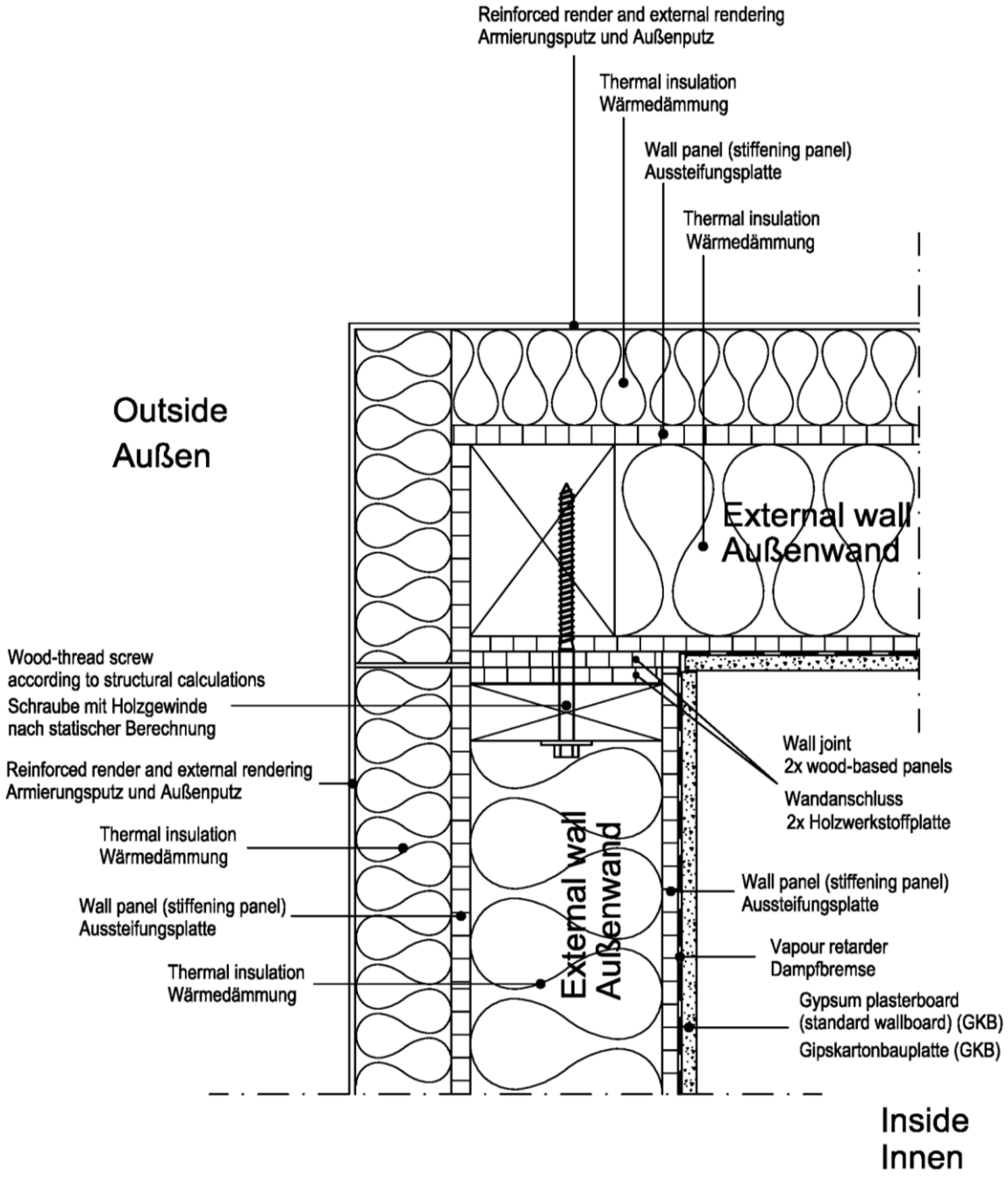
FINGERHAUS

Detail-No.: / Detail-Nr.: 04

Wall joint: external wall outside corner
Wandanschluss: Außenwand Außenecke

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011



Horizontal section
Schnitt horizontal

Deutsches Institut für Bautechnik DIBt

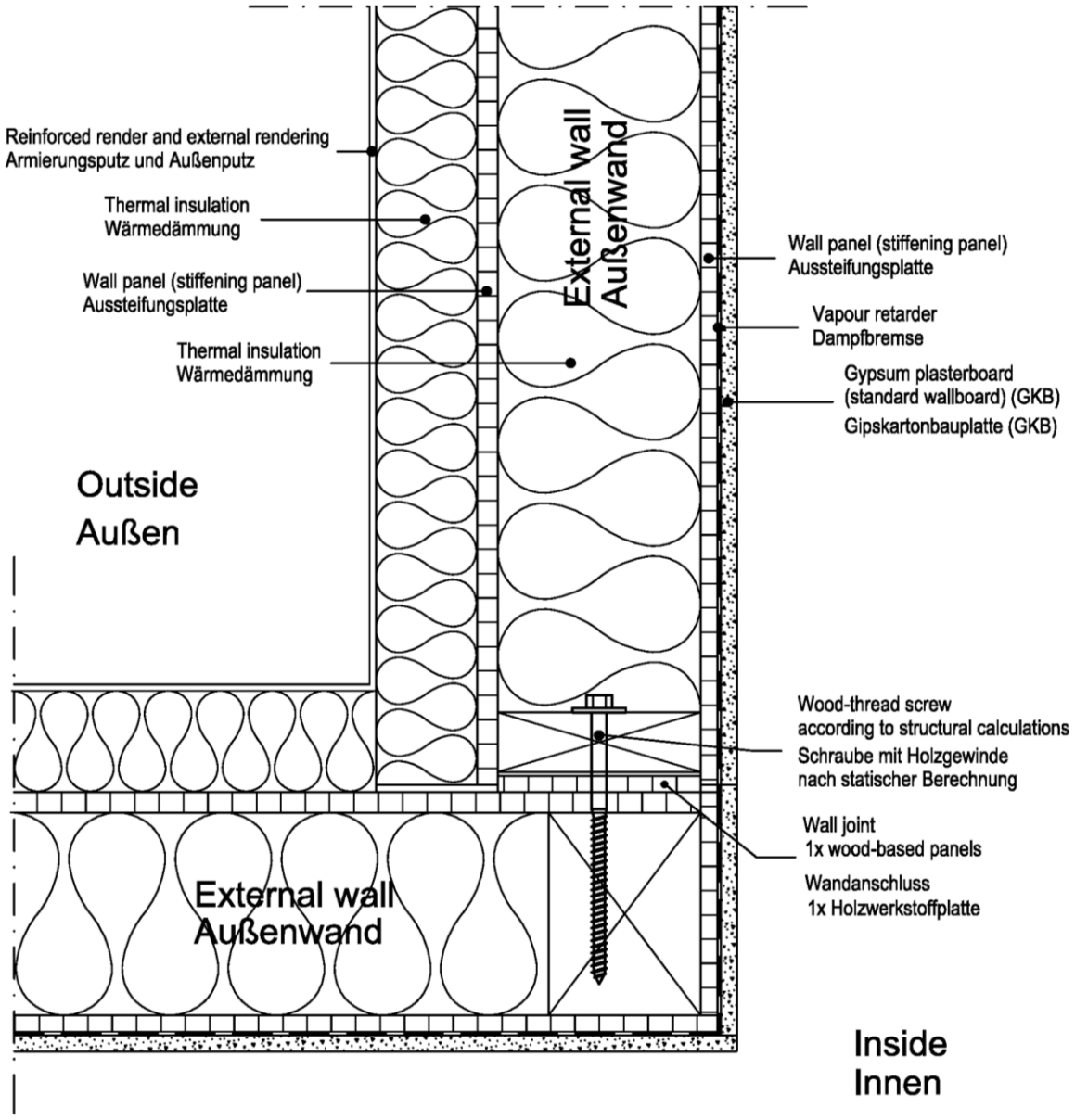
FINGERHAUS

Detail-No.: / Detail-Nr.: 05

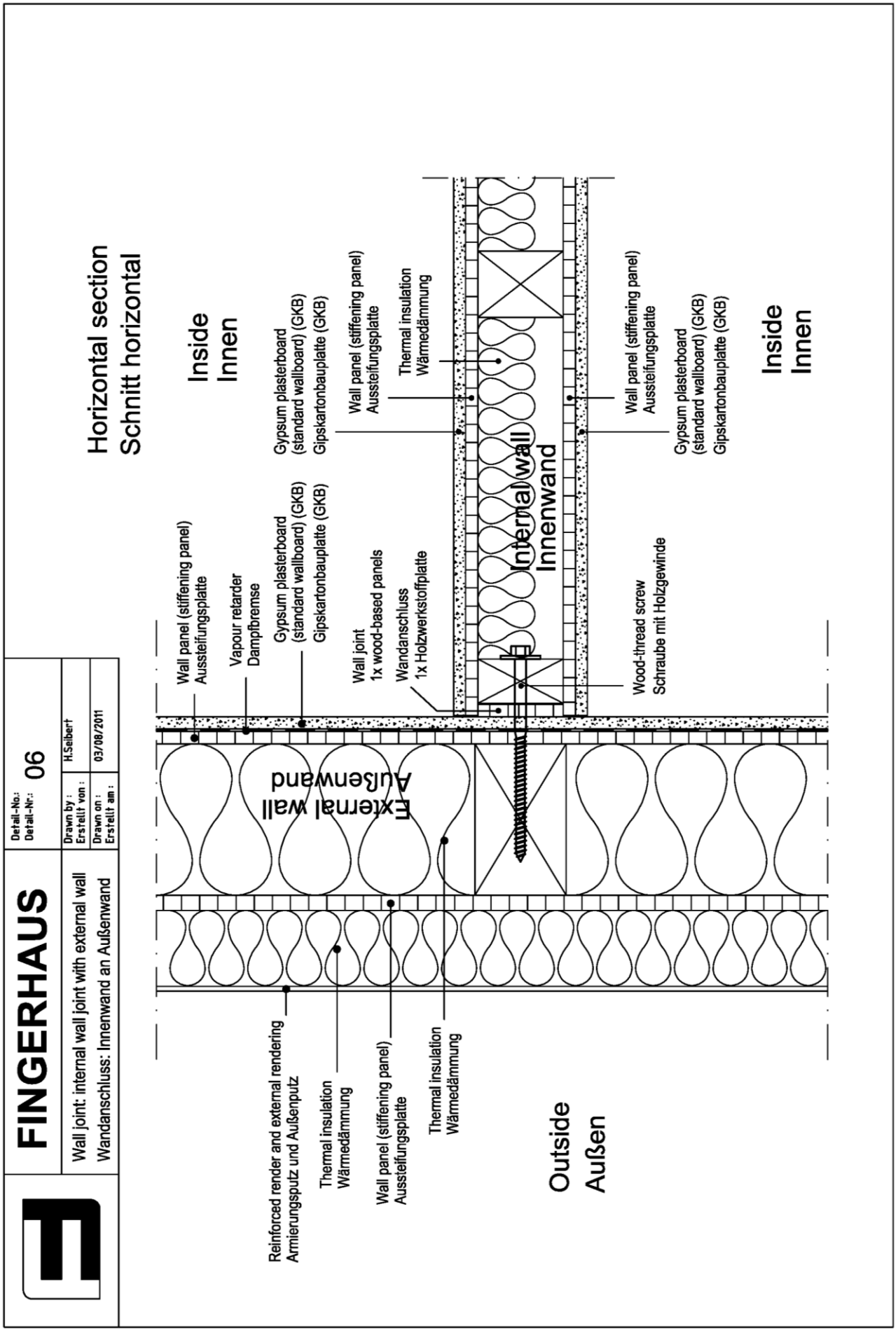
Wall joint: external wall inside corner
Wandanschluss: Außenwand Innenecke

Drawn by : / Erstellt von : H.Seibert

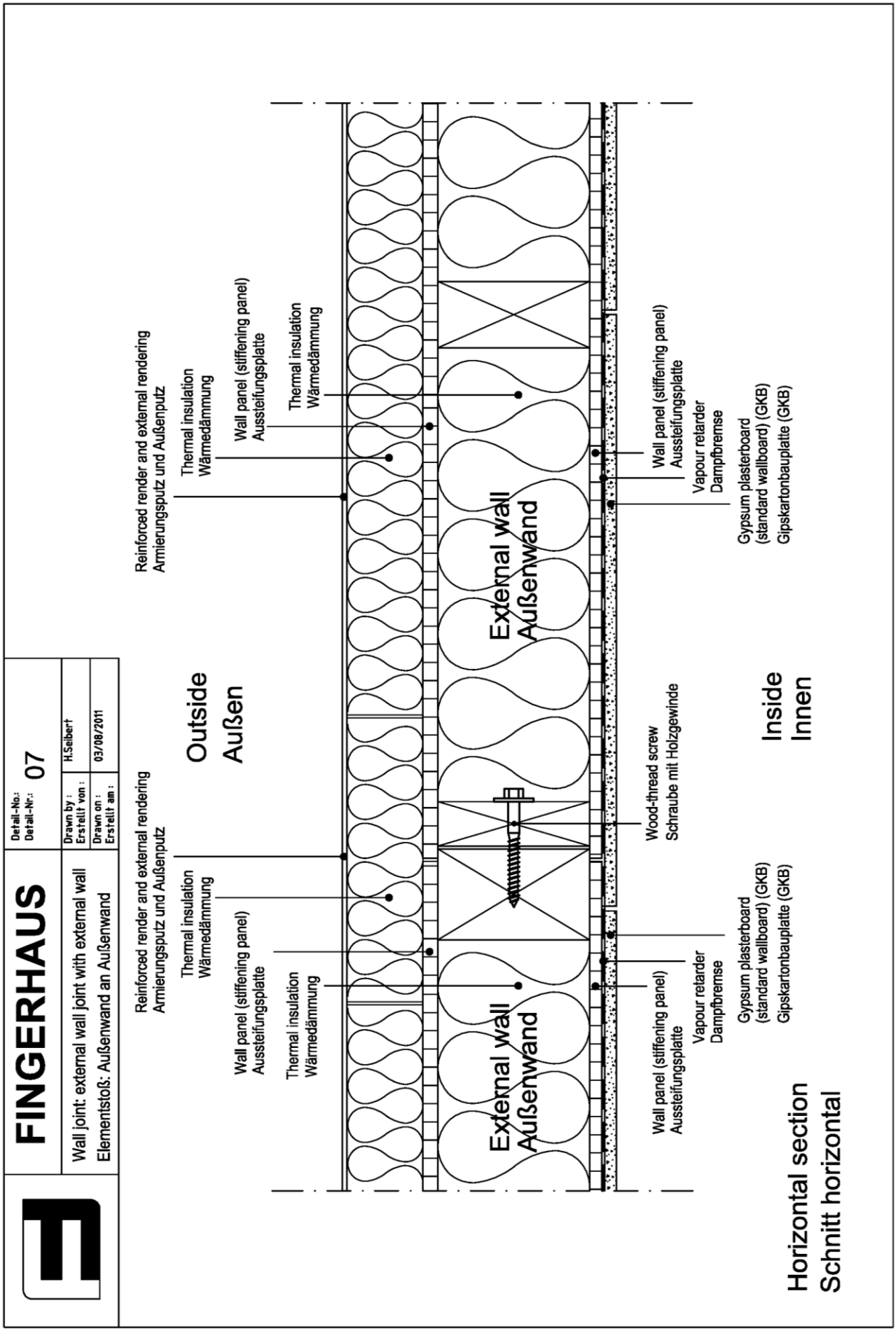
Drawn on : / Erstellt am : 03/08/2011



Horizontal section
Schnitt horizontal



Deutsches Institut für Bautechnik DIBt



Deutsches Institut für Bautechnik DIBt

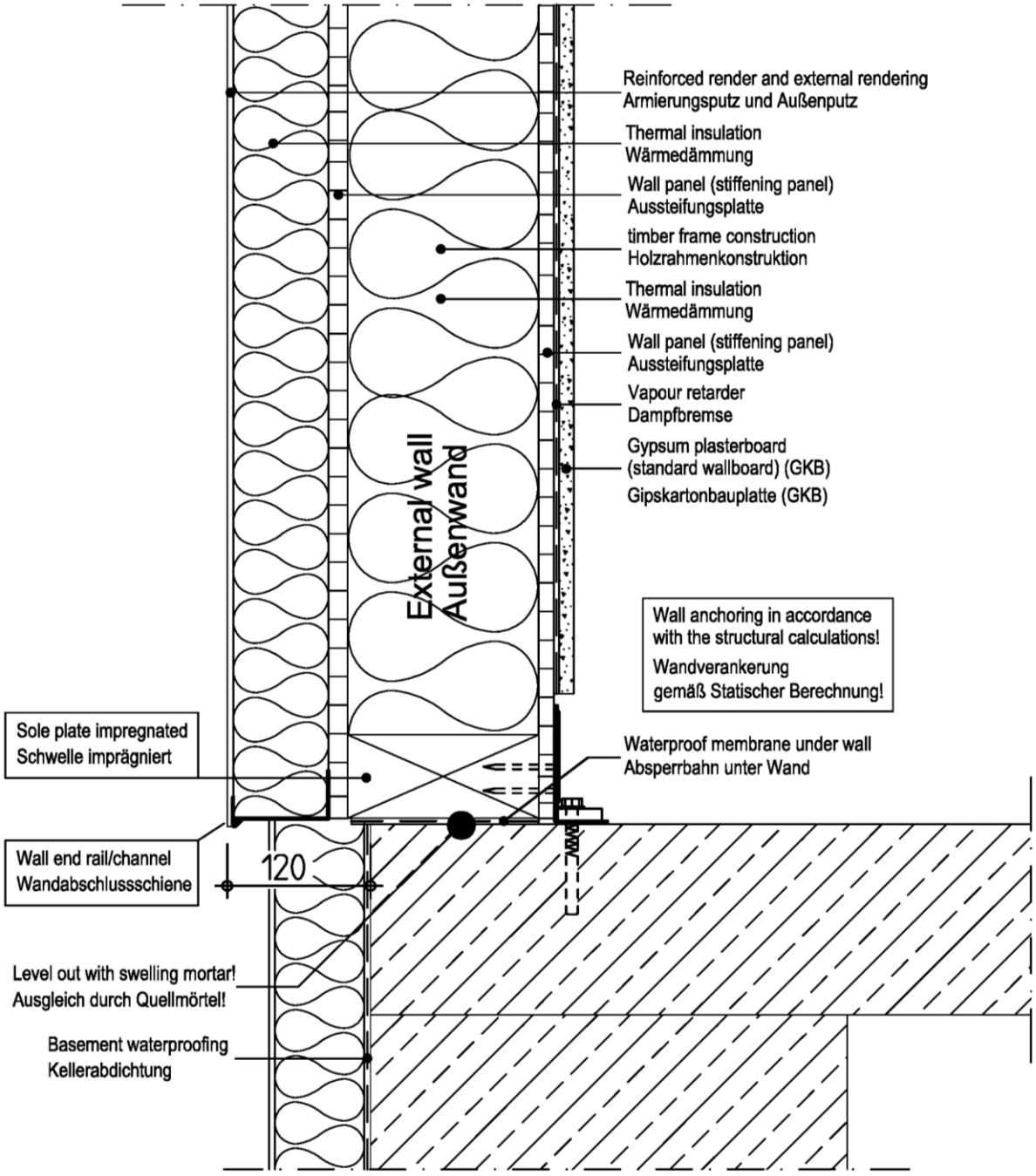
FINGERHAUS

Detail-No.: / Detail-Nr.: 08

Joint: Bottom of external wall
Sockelanschluss Außenwand

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011



Vertical section
Schnitt vertikal

Deutsches Institut für Bautechnik DIBt

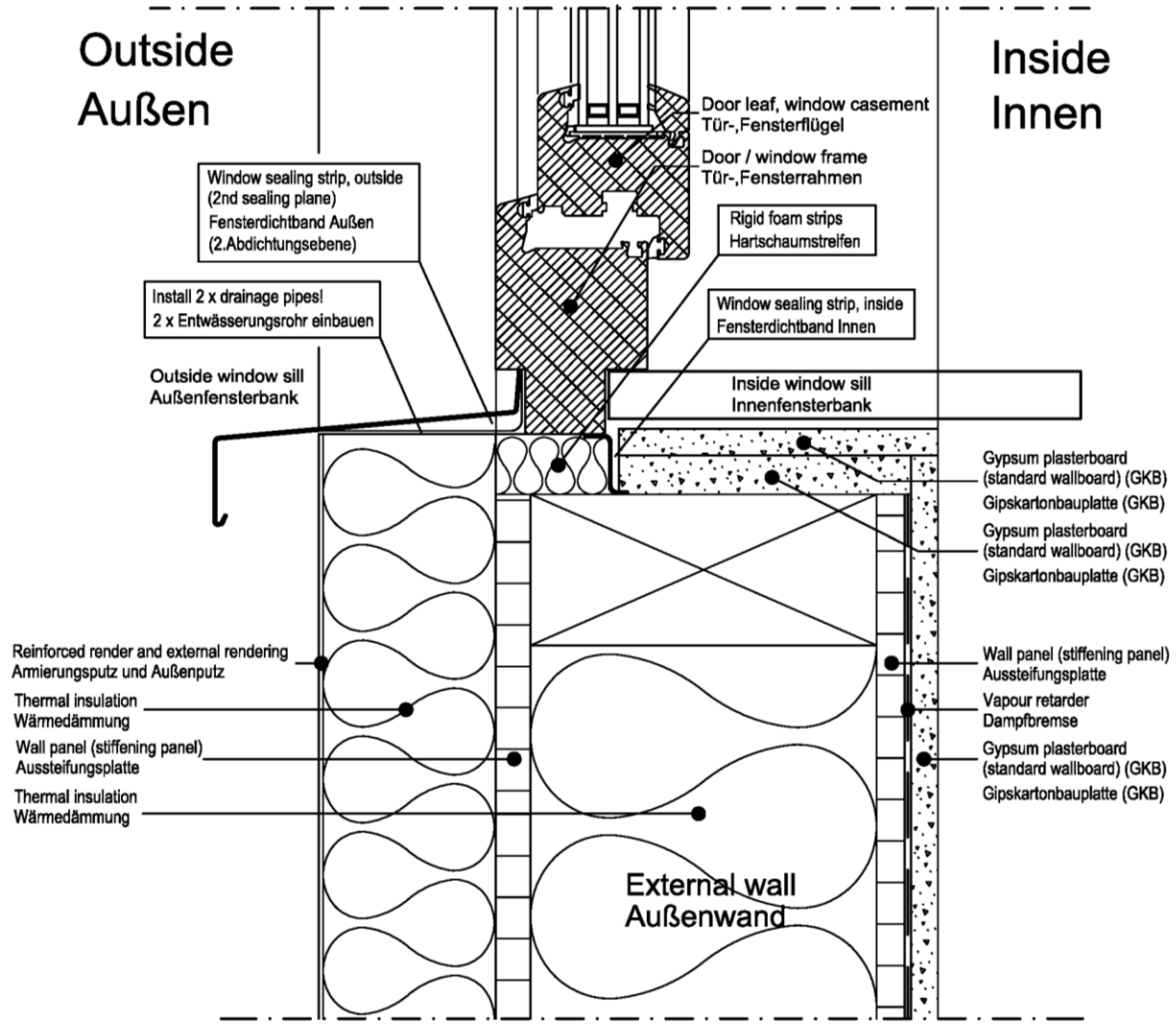
FINGERHAUS

Detail-No.: / Detail-Nr.: 09

Window sill joint
Anschluss Fensterbank

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011



Vertical section
Schnitt vertikal

Deutsches Institut für Bautechnik DIBt

FINGERHAUS

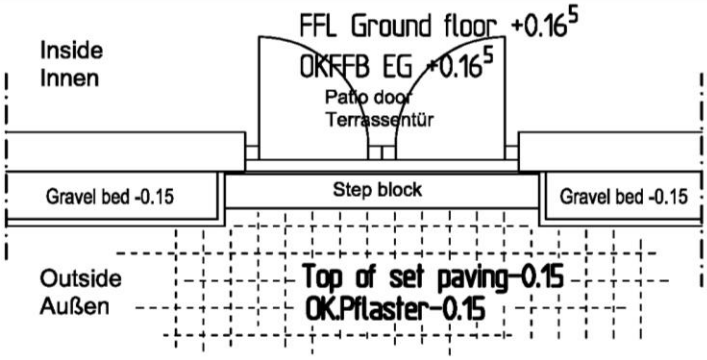
Detail-No.: / Detail-Nr.: 10

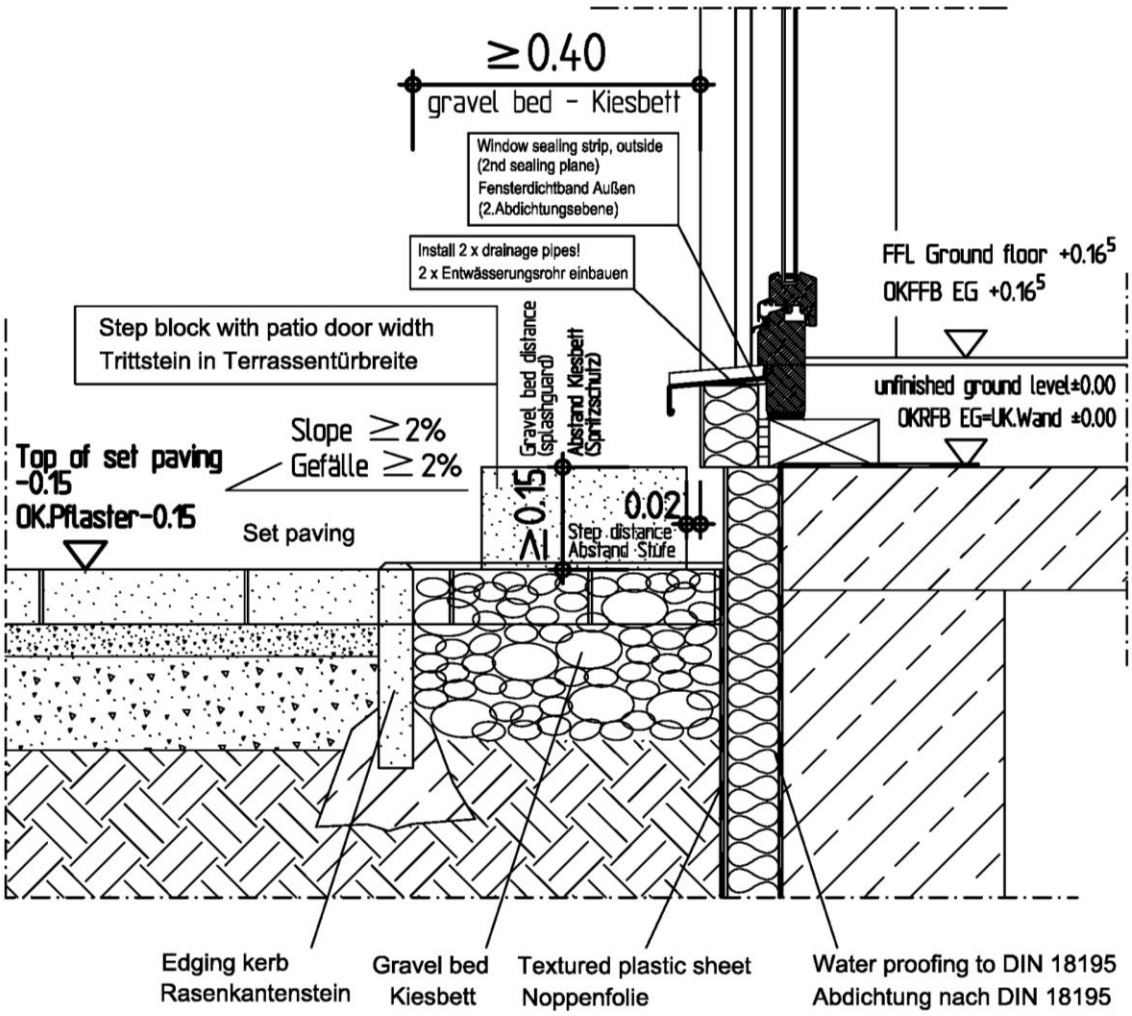
Joint: patio door step
Anschluss: Austritt Terrassentür

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011

Gravel bed to the left and right, next to the patio door!
Kiesbett links und rechts neben der Terrassentür!





Patio door joint
Terrassentüranschluss

Deutsches Institut für Bautechnik DIBt

FINGERHAUS

Detail-No.: / Detail-Nr.: 11

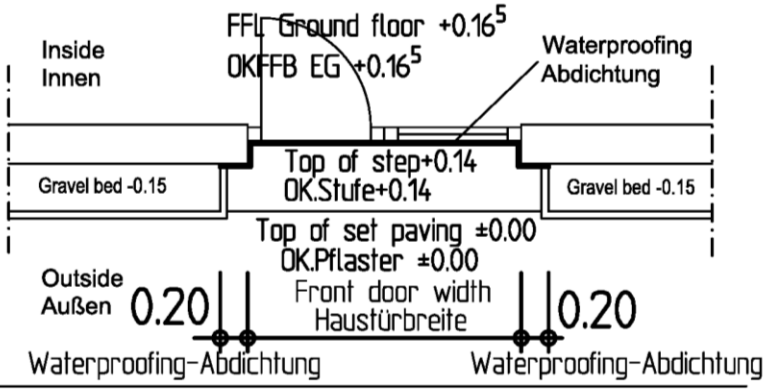
Joint: front door step
Anschluss: Austritt Haustür

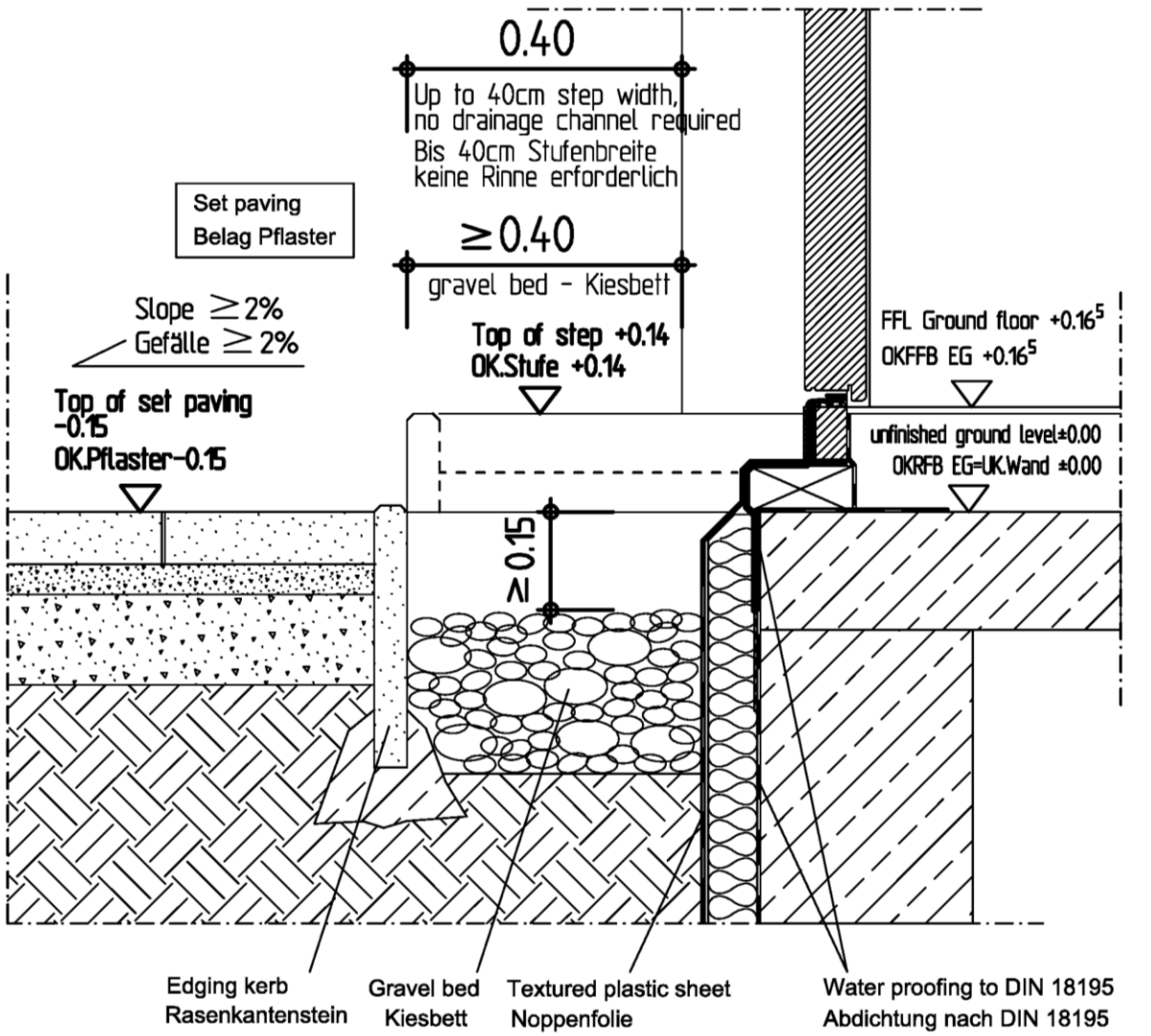
Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011

Standard waterproofing of the external wal in the entrance area, up to 20cm to the left and right next to the front door!

Standardabdichtung der Außenwand im Eingangsbereich bis 20cm links und rechts neben der Haustür!





Front door joint
Haustüranschluss

Deutsches Institut für Bautechnik DIBt

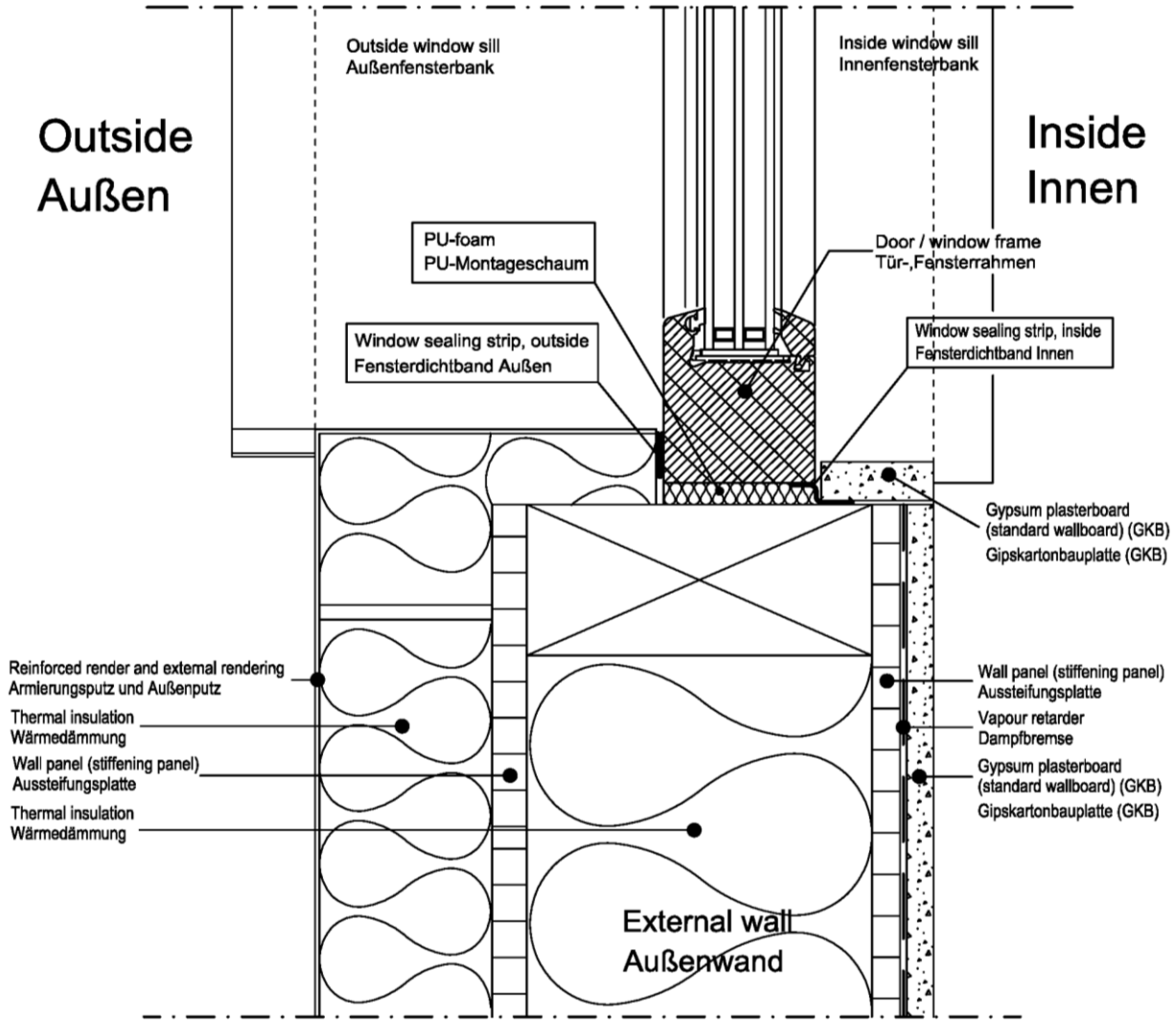
FINGERHAUS

Detail-No.: / Detail-Nr.: 12

Side joint, front door and fixed staircase window without roller shutters
Seitlicher Anschluss Haustür und feststehendesTreppenhausfenster ohne Rollladen

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011



Horizontal section
Schnitt horizontal

Deutsches Institut für Bautechnik DIBt

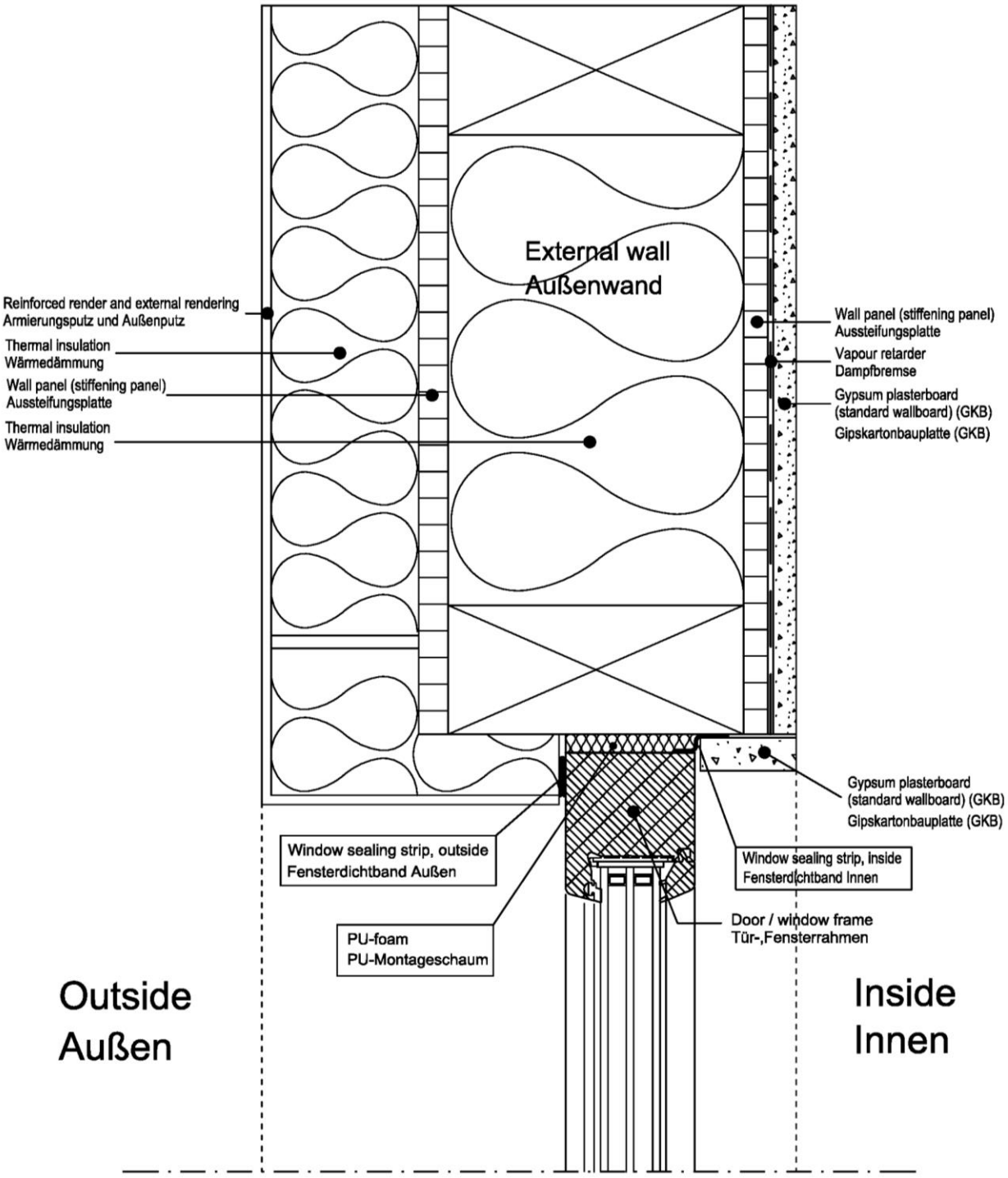
FINGERHAUS

Detail-No.: / Detail-Nr.: 13

Upper joint, front door and fixed staircase window without roller shutters
Oberer Anschluss Haustür und feststehendesTreppenhausfenster ohne Rollladen

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011



Vertical section
Schnitt vertikal

Deutsches Institut für Bautechnik DIBt

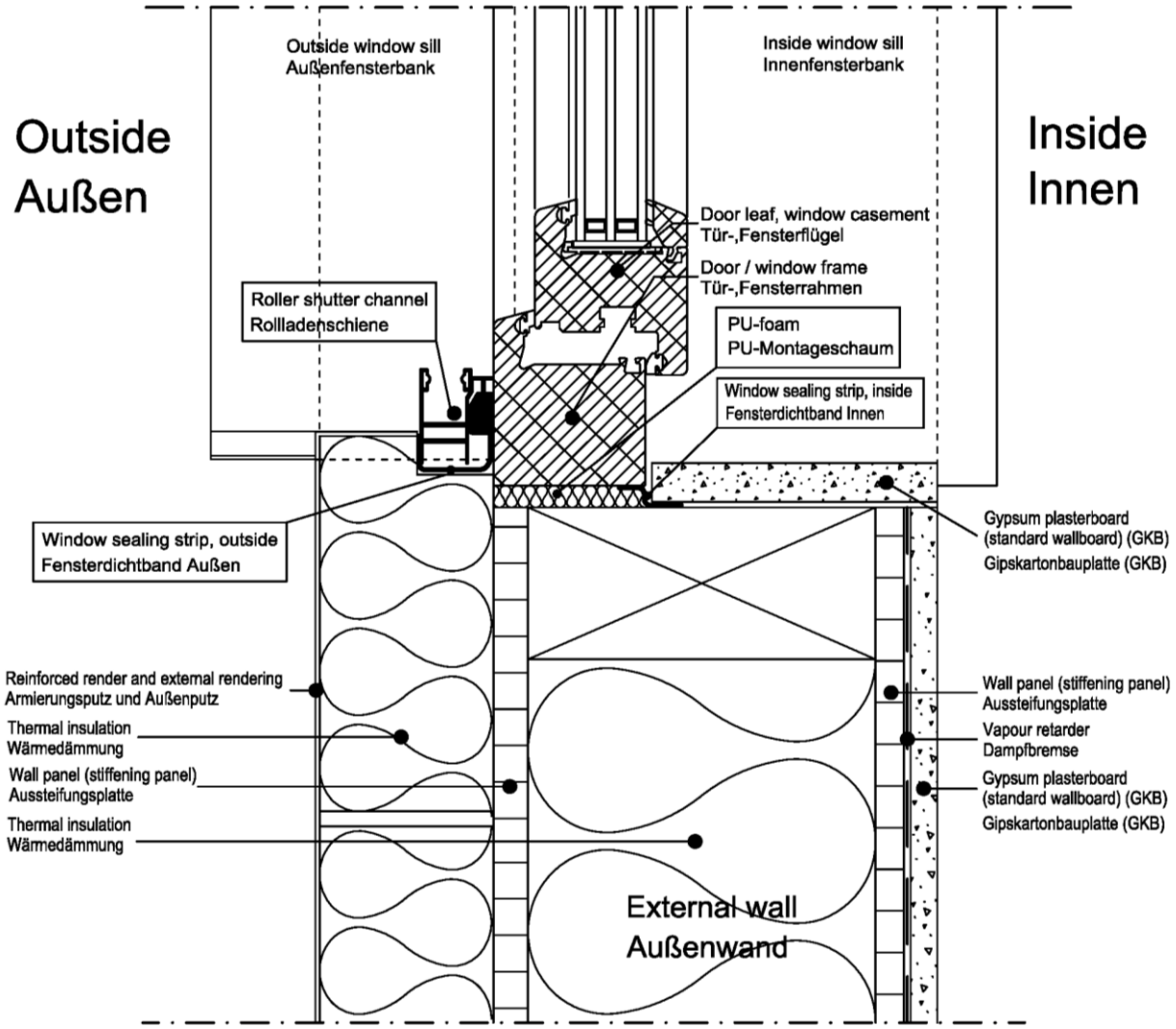
FINGERHAUS

Detail-No.: / Detail-Nr.: 14

Side joint, window and patio door with roller shutters
Seitlicher Anschluss Fenster und Terrassentür mit Rollladen

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011

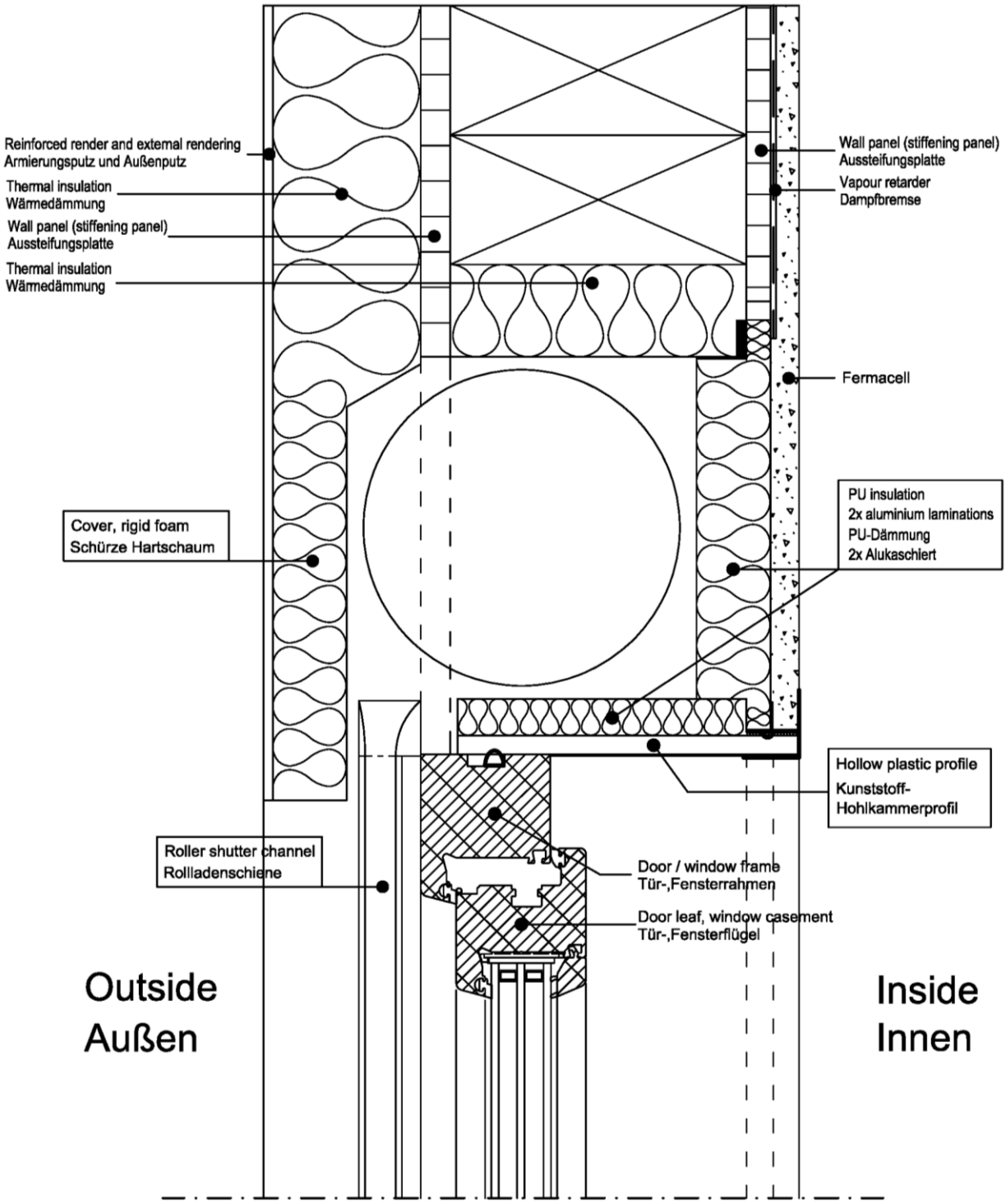


Horizontal section
Schnitt horizontal

Deutsches Institut für Bautechnik DIBt

FINGERHAUS

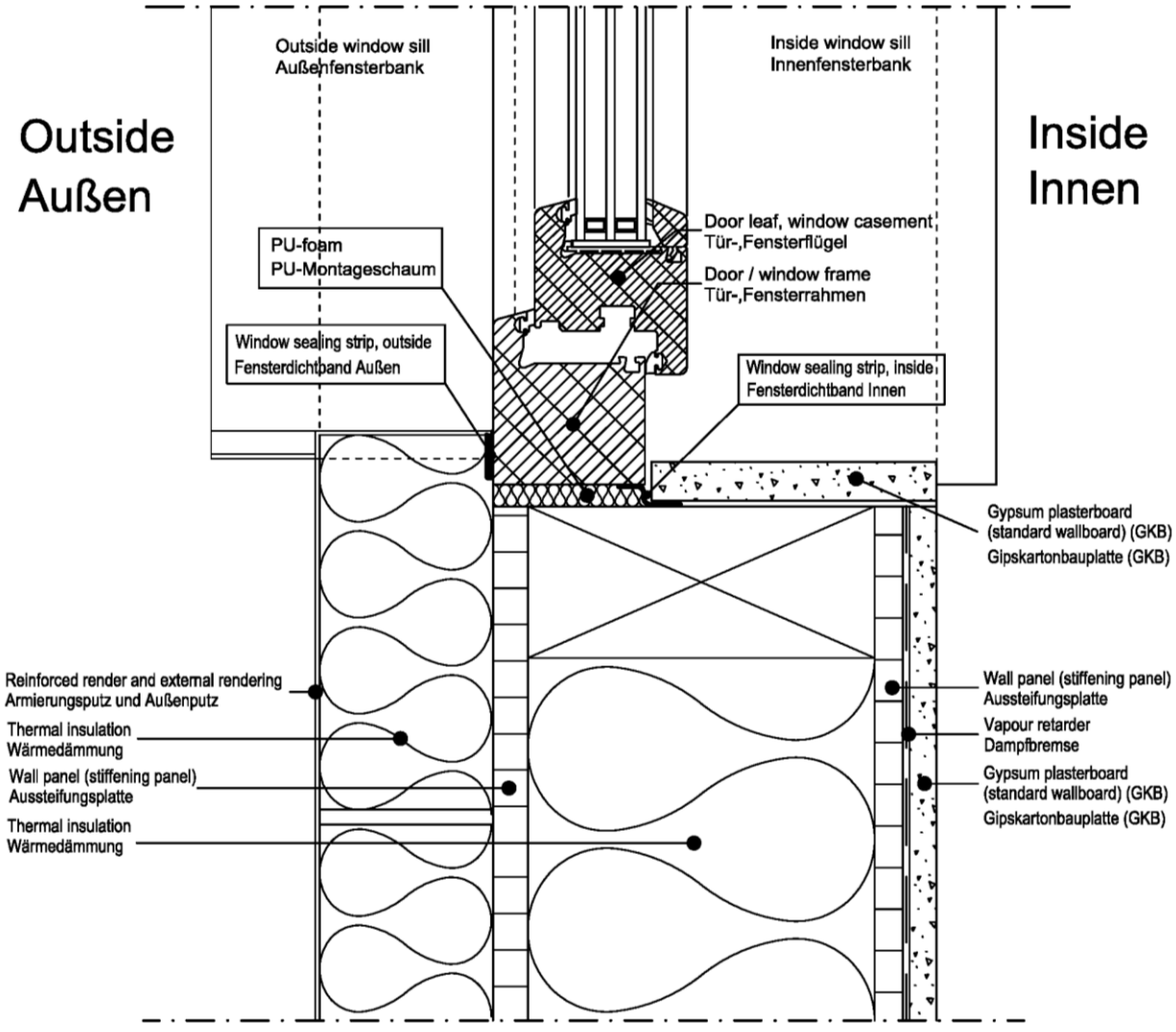
Detail-No.: Detail-Nr.:	15
Top joint, window and patio door with roller shutters Oberer Anschluss Fenster und Terrassentür mit Rollladen	Drawn by : Erstellt von : H.Seibert
	Drawn on : Erstellt am : 03/08/2011



Vertical section
Schnitt vertikal

Deutsches Institut für Bautechnik DIBt

	FINGERHAUS	Detail-No.: Detail-Nr.:	16
	Side joint, window and patio door without roller shutters Seitlicher Anschluss Fenster und Terrassentür ohne Rollladen	Drawn by : Erstellt von :	H.Seibert
		Drawn on : Erstellt am :	03/08/2011



Horizontal section
Schnitt horizontal

Deutsches Institut für Bautechnik DIBt

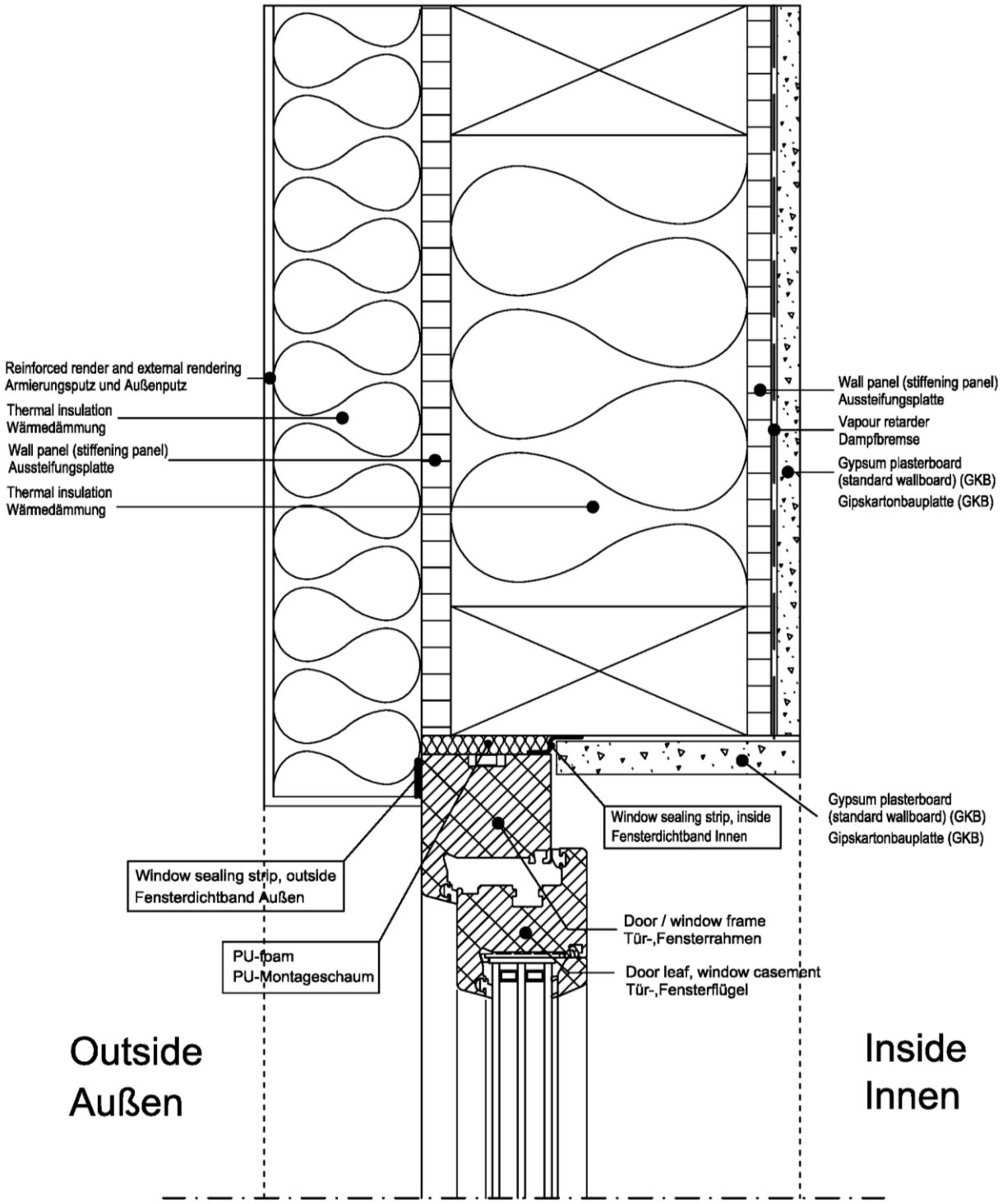
FINGERHAUS

Detail-No.: / Detail-Nr.: 17

Top joint, window and patio door without roller shutters
Oberer Anschluss Fenster und Terrassentür ohne Rollladen

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011



Vertical section
Schnitt vertikal

Deutsches Institut für Bautechnik DIBt

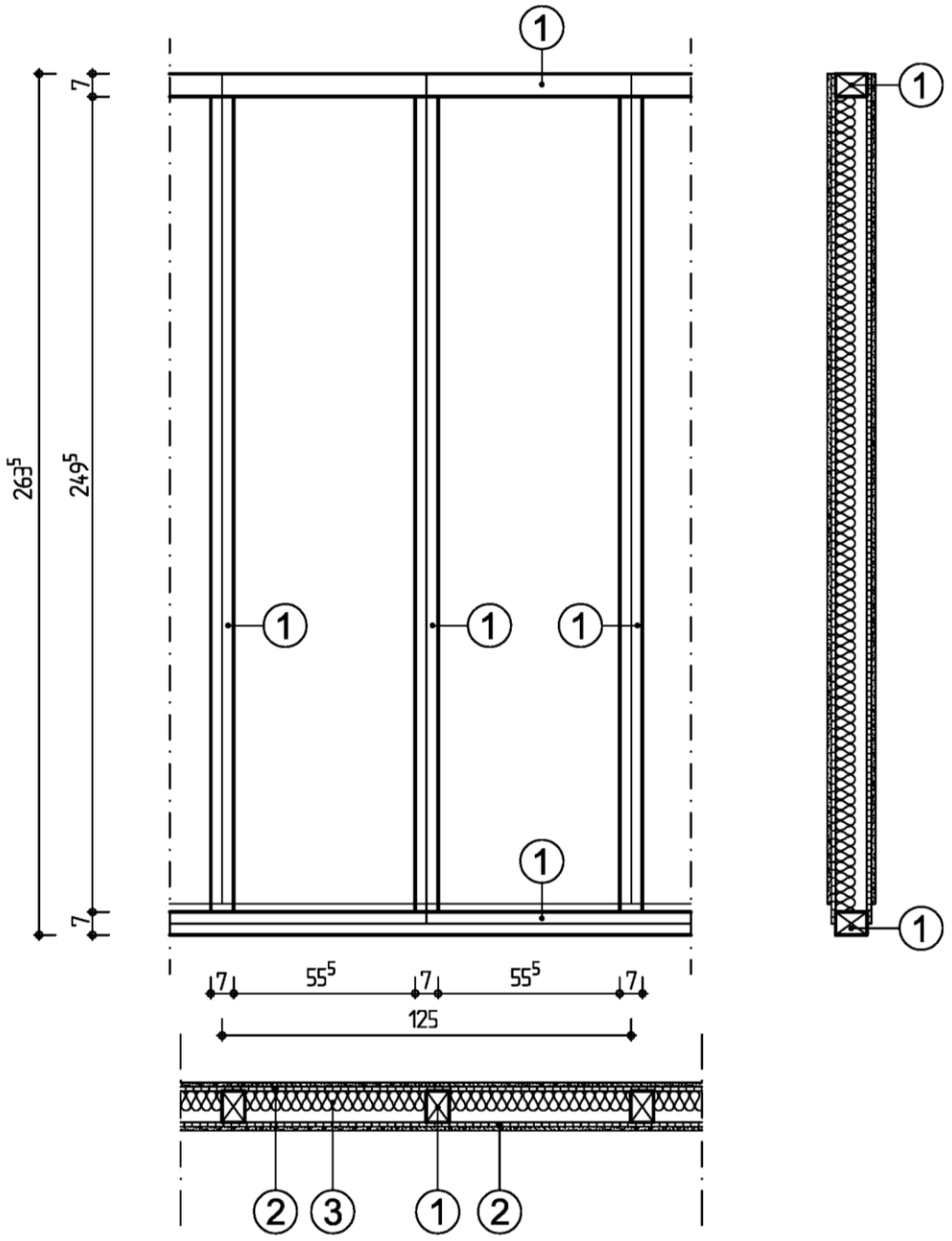
FINGERHAUS

Detail-No.: / Detail-Nr.: 18

Standard internal wall element
Standard Innenwandelement

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011



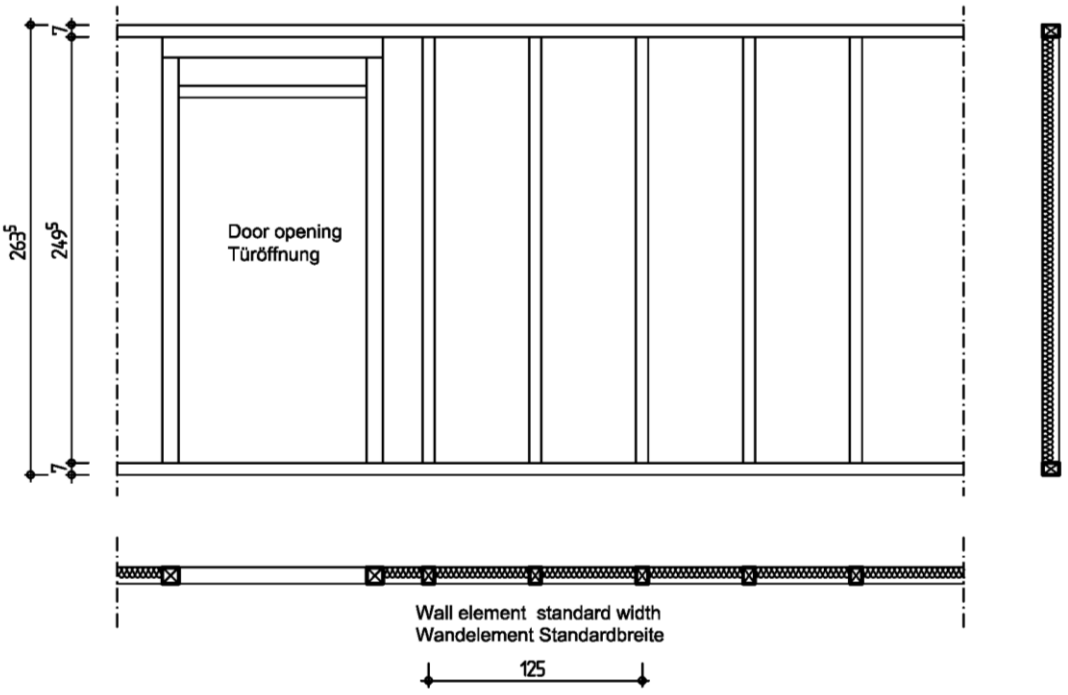
1 = Framing timber (timber studs)
Rahmenhölzer

2 = Wall panel (stiffening panel)
Aussteifungsplatte

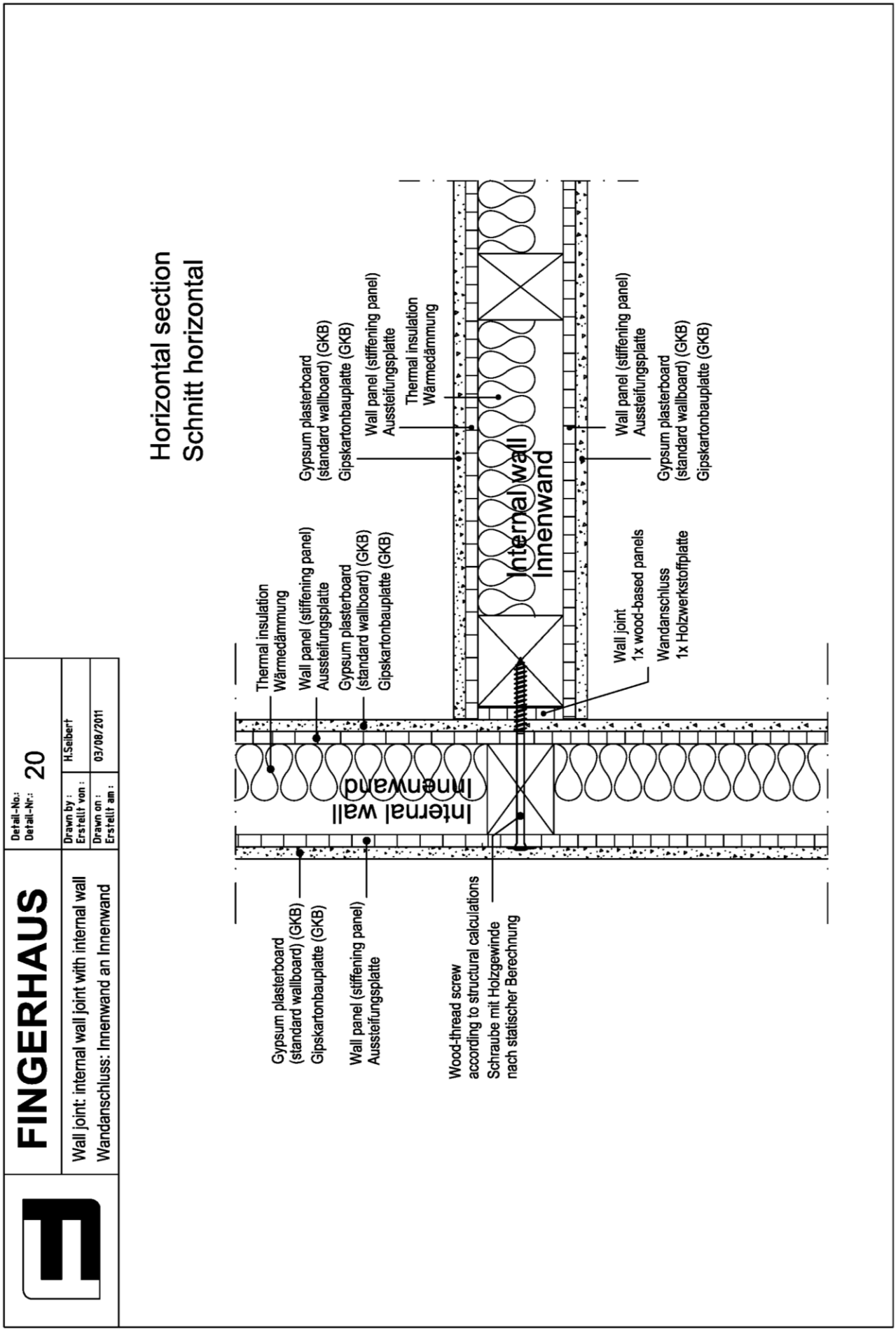
3 = Thermal and sound insulation
Wärme- und Schalldämmung

Deutsches Institut für Bautechnik DIBt

	FINGERHAUS	Detail-No.: Detail-Nr.:	19
	View of internal wall element Ansicht Innenwandelement	Drawn by : Erstellt von :	H.Seibert
		Drawn on : Erstellt am :	03/08/2011

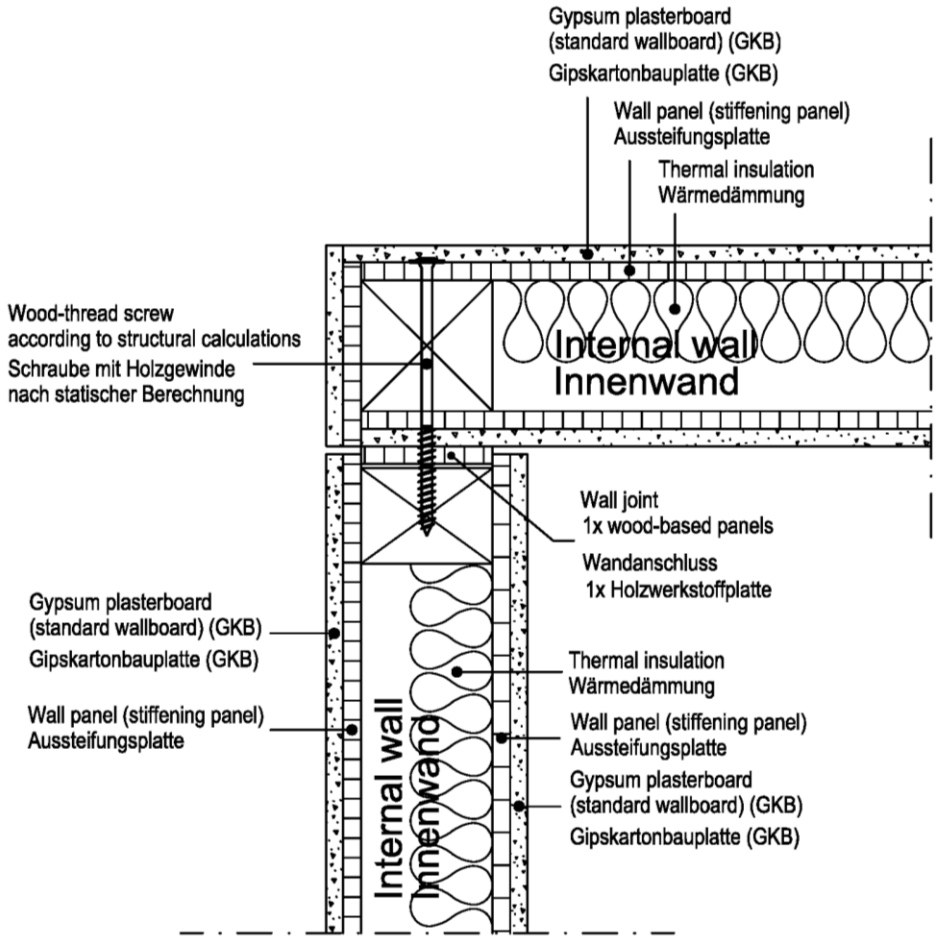


Deutsches Institut für Bautechnik DIBt



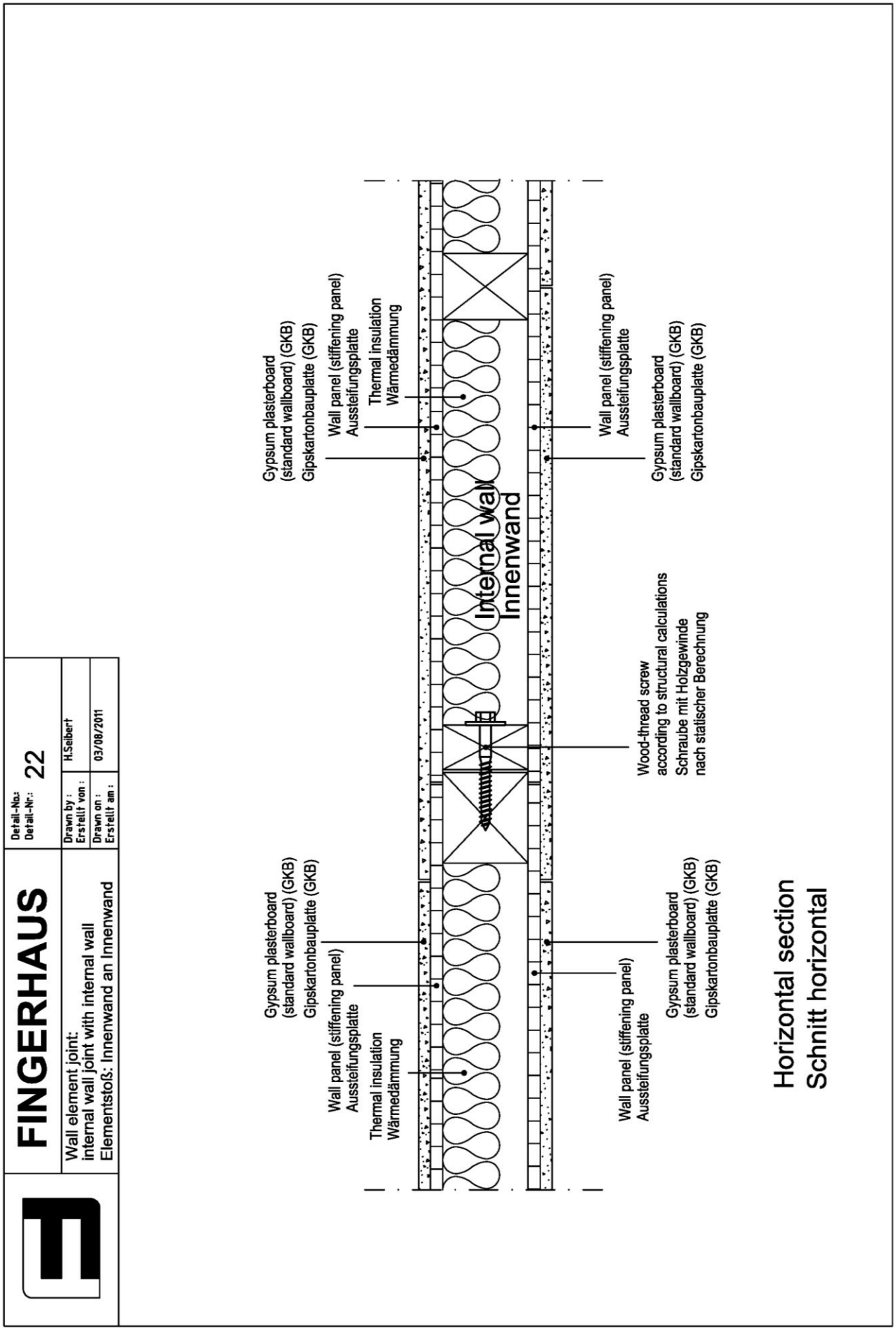
Deutsches Institut für Bautechnik DIBt

	FINGERHAUS	Detail-No.: / Detail-Nr.:	21
	Wall joint: internal wall joint with internal wall (corner) Wandanschluss: Innenwand an Innenwand (Ecke)	Drawn by : / Erstellt von :	H.Seibert
		Drawn on : / Erstellt am :	03/08/2011



Horizontal section
Schnitt horizontal

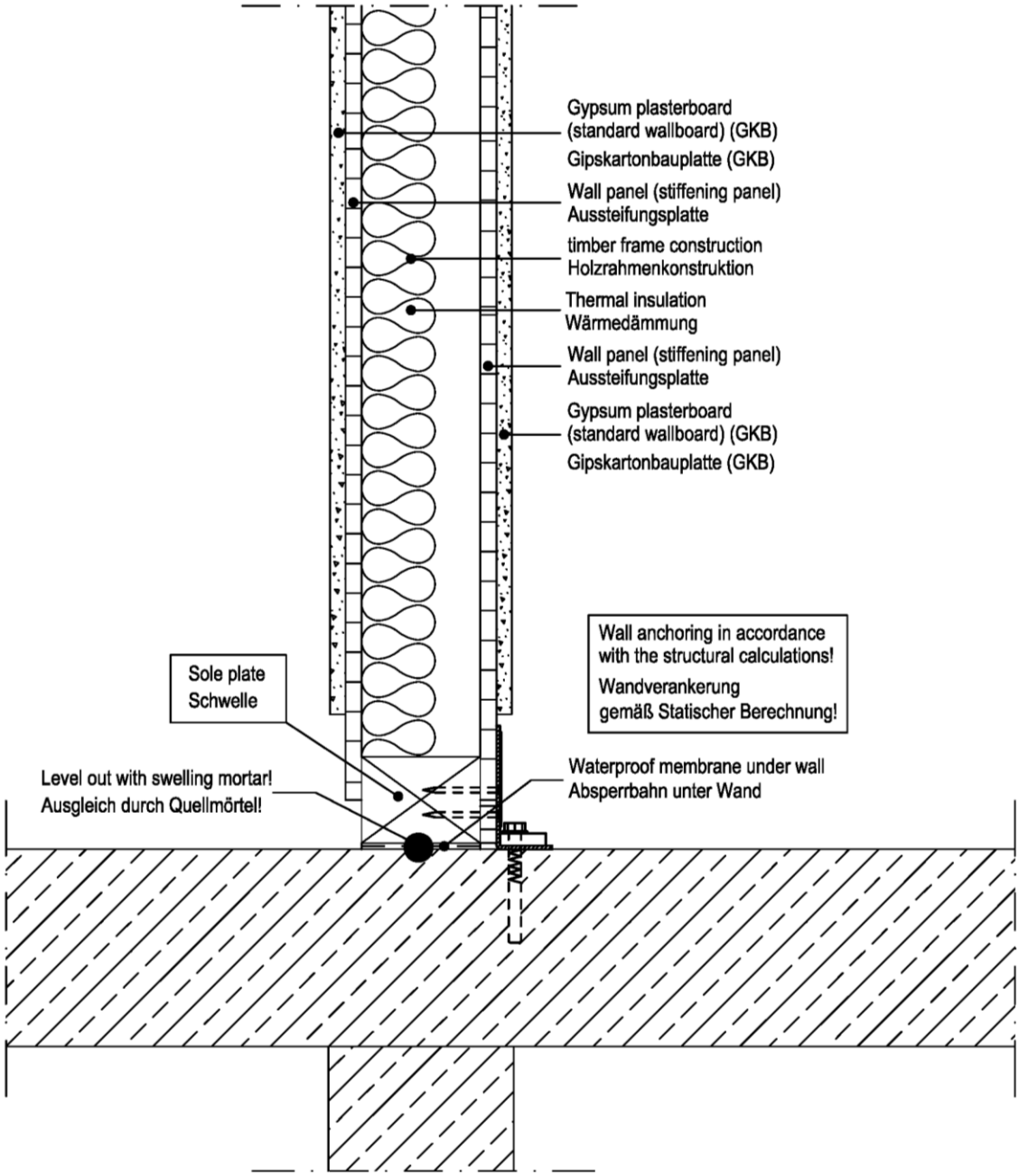
Deutsches Institut für Bautechnik DIBt



Deutsches Institut für Bautechnik DIBt

FINGERHAUS

Detail-No.: / Detail-Nr.:	23
Joint between internal wall and basement ceiling/foundation slab Anschluss Innenwand an Kellerdecke/Fundamentplatte	Drawn by : / Erstellt von : H.Seibert
	Drawn on : / Erstellt am : 03/08/2011



Vertical section
Schnitt vertikal

Deutsches Institut für Bautechnik DIBt

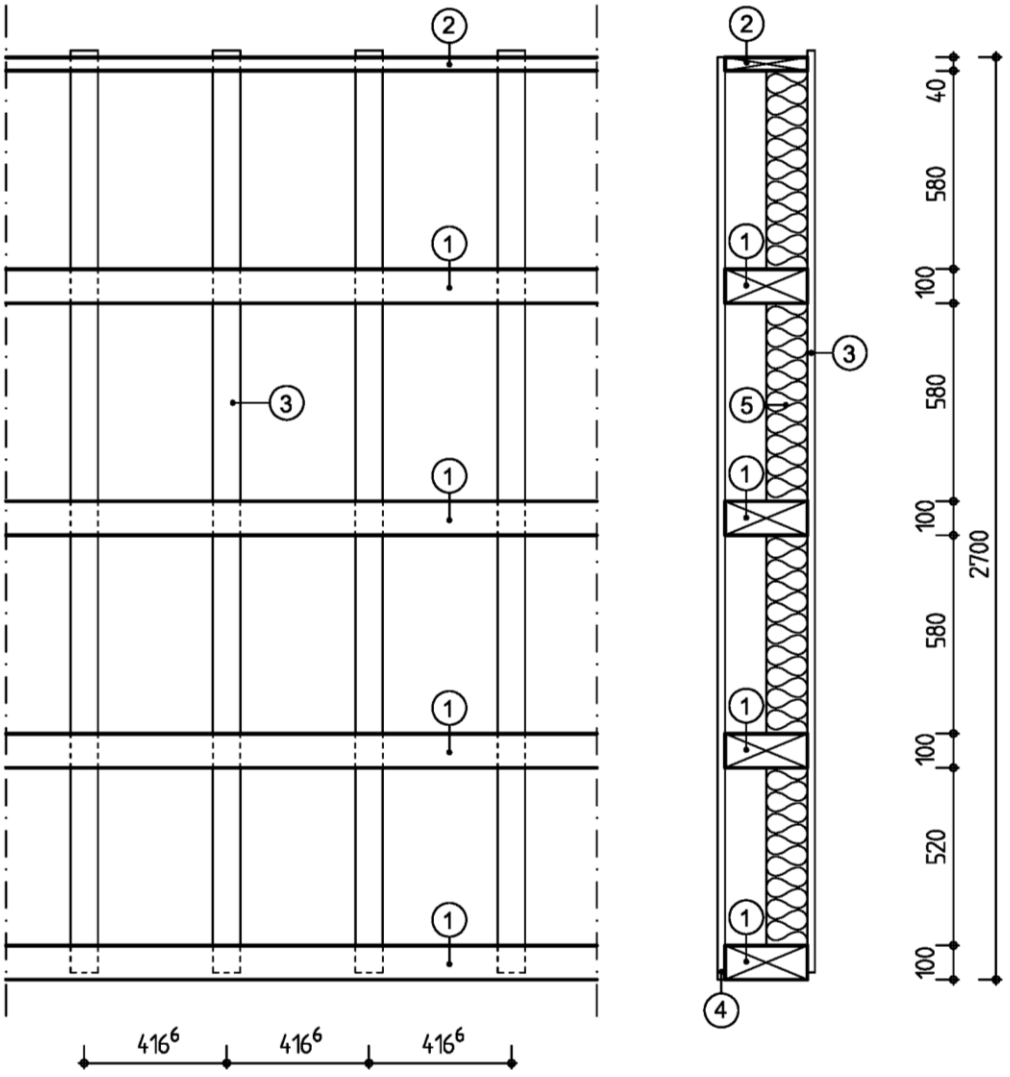
FINGERHAUS

Detail-No.: / Detail-Nr.: 24

Ceiling (floor) section through ceiling/floor element
Geschossdecke (Zwischendecke)
Schnitt durch Deckenelement

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011



1 = Ceiling joists in accordance with structural calculations
Deckenbalken gemäß Statischer Berechnung

2 = Plank
Bohle

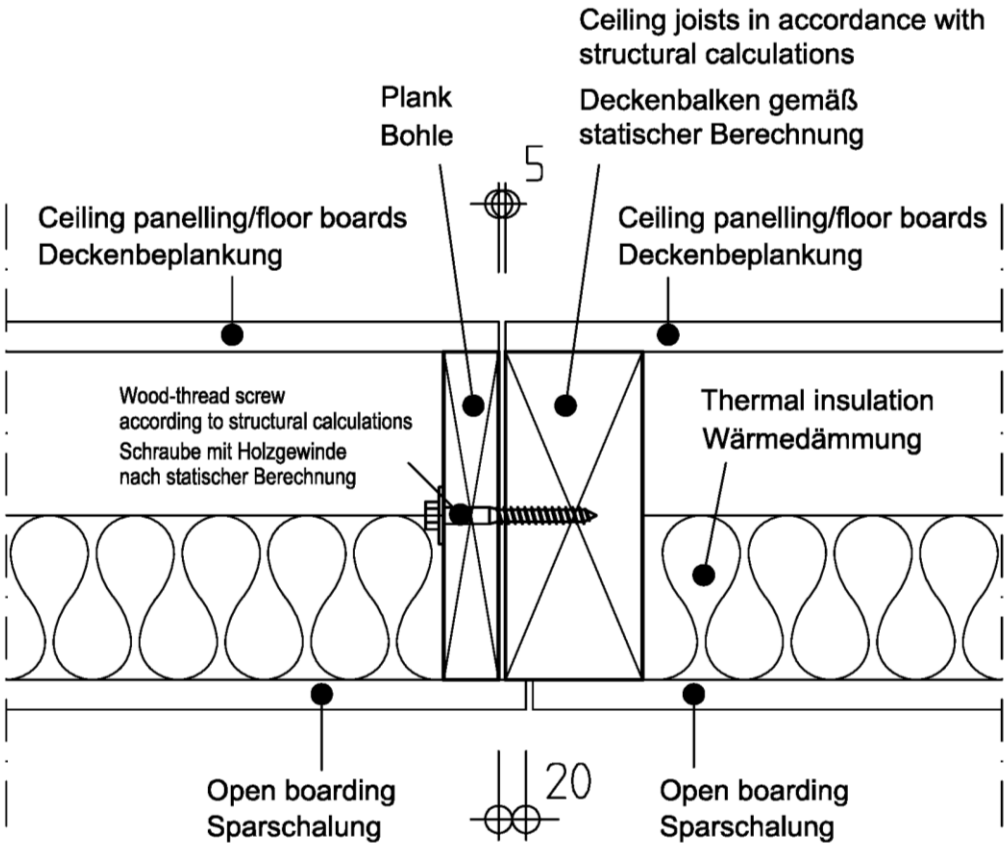
3 = Open boarding
Sparschalung

4 = Ceiling panelling/floor boards
Deckenbeplankung

5 = Thermal insulation
Wärmedämmung

Deutsches Institut für Bautechnik DIBt

	FINGERHAUS	Detail-No.: Detail-Nr.:	25
	Ceiling (floor): ceiling element joint Geschossdecke (Zwischendecke) Deckenelementstoß	Drawn by : Erstellt von :	H.Seibert
		Drawn on : Erstellt am :	03/08/2011



Vertical section
Schnitt vertikal

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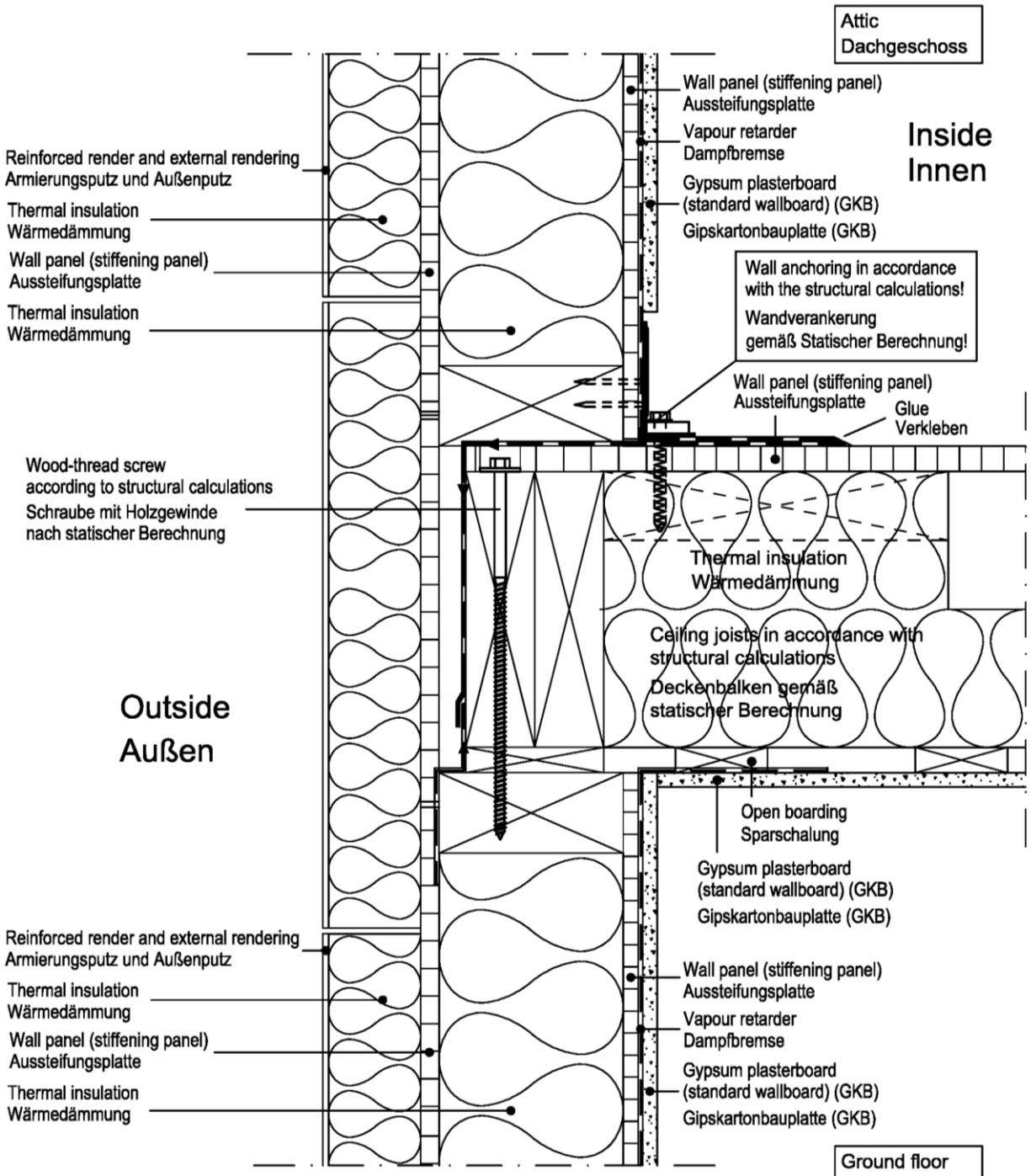
FINGERHAUS

Detail-No.: / Detail-Nr.: 26

joint: external wall with ceiling (floor)
Anschluss Außenwand an Geschossdecke (Zwischendecke)

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 21/05/2011



Vertical section
Schnitt vertikal

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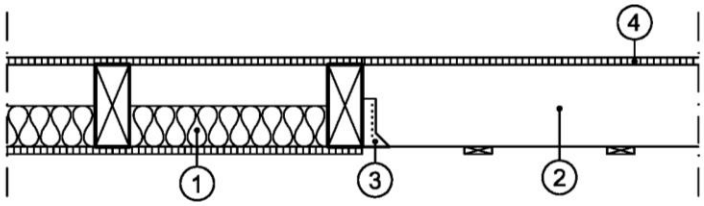
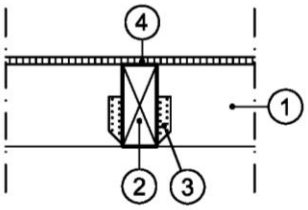
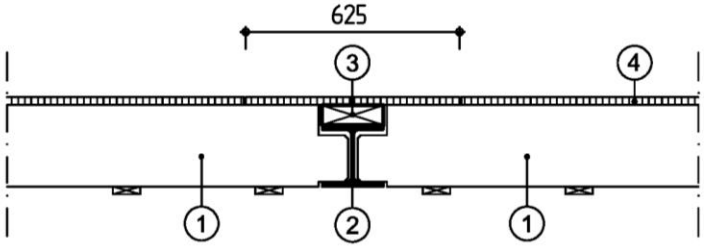
	FINGERHAUS	Detail-No.: / Detail-Nr.:	27
	Ceiling (floor): connection of the ceiling joists Geschossdecke (Zwischendecke) Verbindung der Deckenbalken	Drawn by : / Erstellt von :	H.Seibert
		Drawn on : / Erstellt am :	03/08/2011

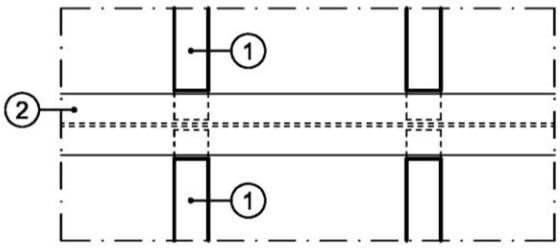




1 = Ceiling / floor element
Deckenelement
2 = Ceiling joists
Deckenbalken
3 = Joist hanger in accordance with structural calculations
Balkenschuh gemäß Statischer Berechnung
4 = Ceiling panelling / floor boards
Deckenbeplankung

Install wood-based board on construction site
Holzwerkstoffplatte auf Baustelle einbauen





Plan view of steel girder
Draufsicht Stahlträger

1 = Ceiling / floor element
Deckenelement
2 = Steel girder in accordance with structural calculations
Stahlträger gemäß statischer Berechnung
3 = Packing piece
Füllholz
4 = Ceiling panelling / floor boards
Deckenbeplankung

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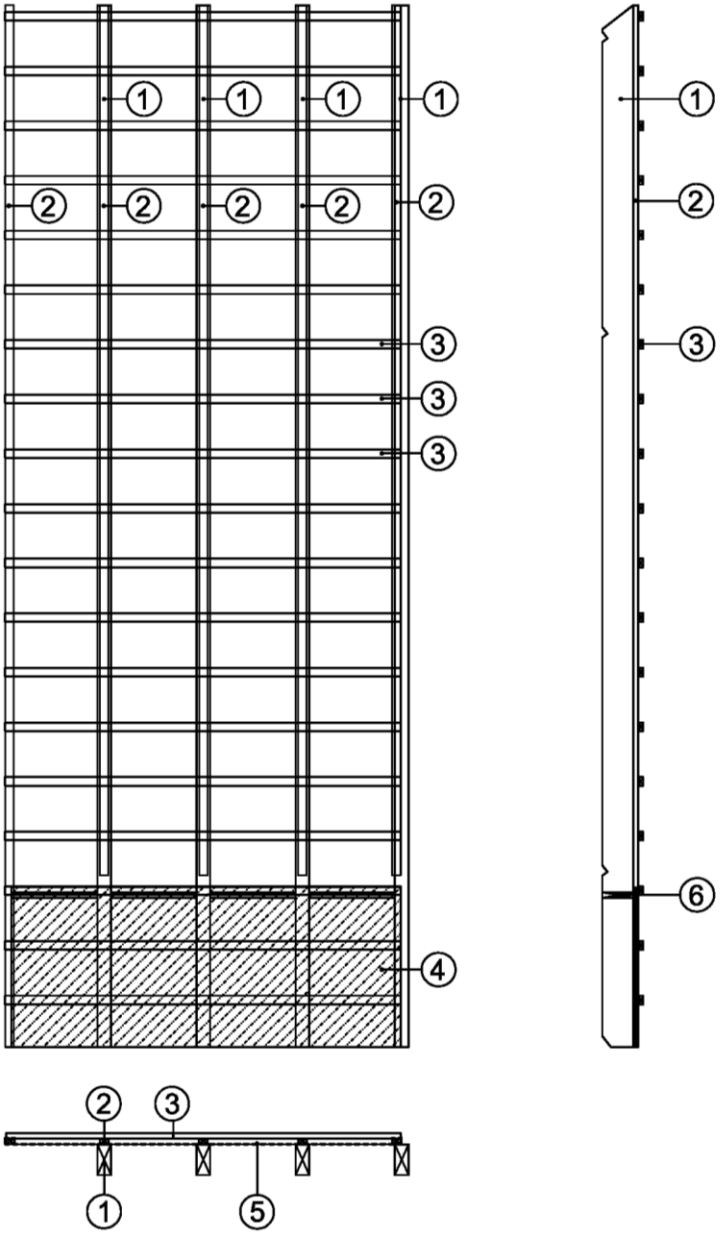
FINGERHAUS

Detail-No.: / Detail-Nr.: 28

View of roof element
Ansicht Dachelement

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011



1 = Rafters
Sparren

2 = Counter lathing
Konterlatte

3 = Cross joist
Traglatte

4 = Profile boarding in the area of the roof overhang / eaves
Profilschalung im Bereich Dachüberstand

5 = Underlay
Unterspannbahn

6 = Board
Stellbrett

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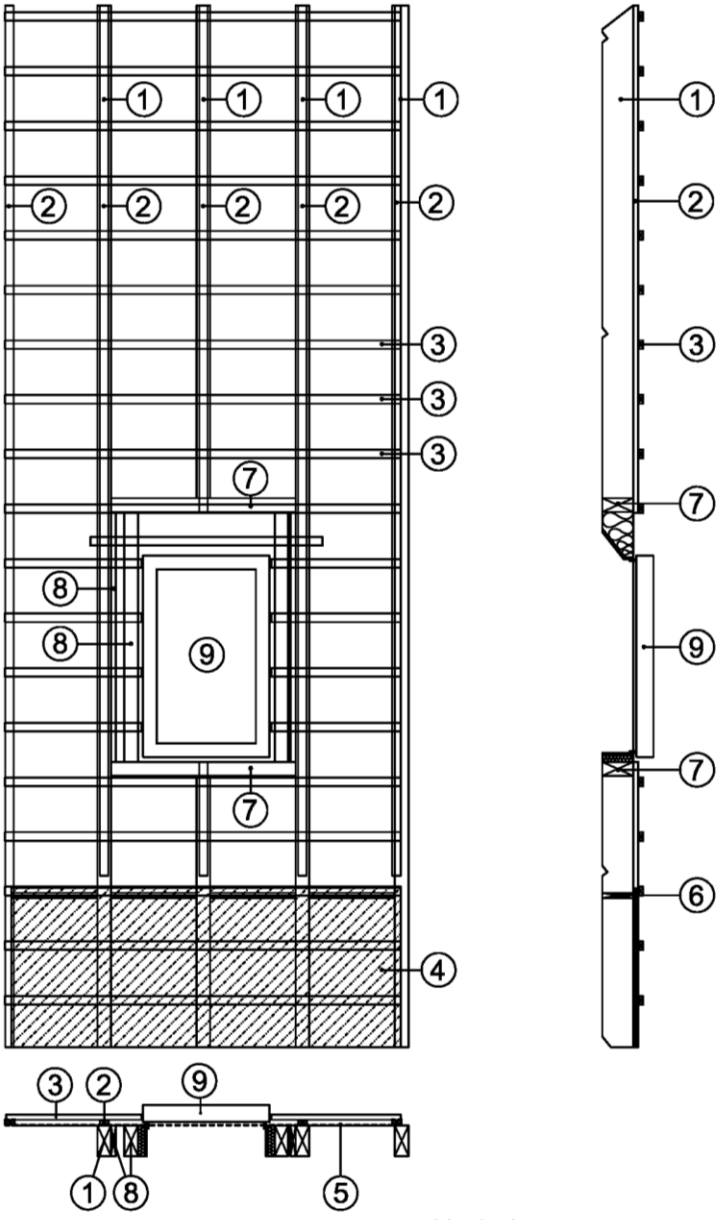
FINGERHAUS

Detail-No.: / Detail-Nr.: 29

Roof element with roof window
Dachelement mit Dachflächenfenster

Drawn by : / Erstellt von : H.Seibert

Drawn on : / Erstellt am : 03/08/2011



1 = Rafters
Sparren

2 = Counter lathing
Konterlatte

3 = Cross joist
Traglatte

4 = Profile boarding in the area of the roof overhang / eaves
Profilschalung im Bereich Dachüberstand

5 = Underlay
Unterspannbahn

6 = Board
Stellbrett

7 = Rail
Riegel

8 = Packing piece
Füllholz

9 = Roof window
Dachflächenfenster

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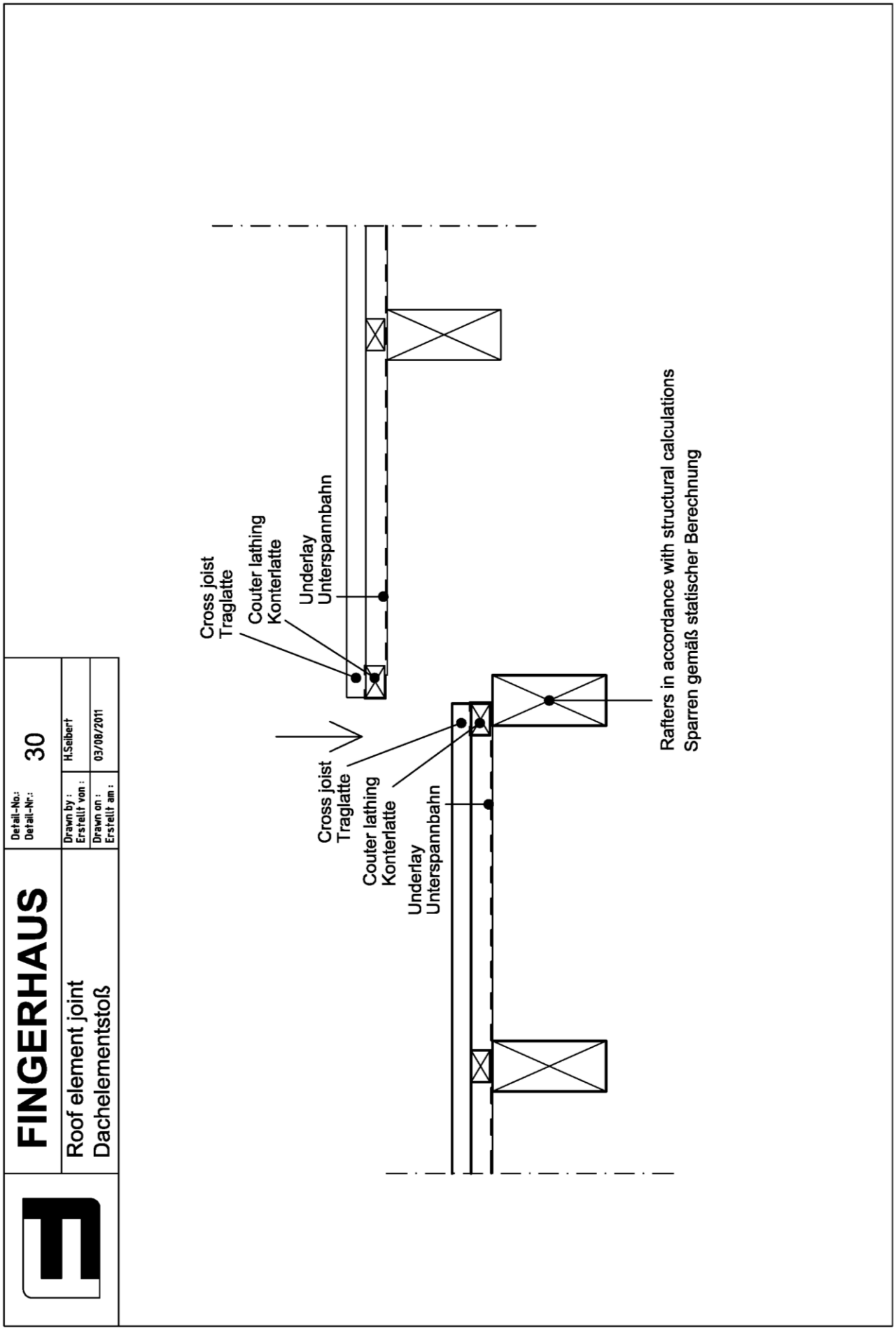

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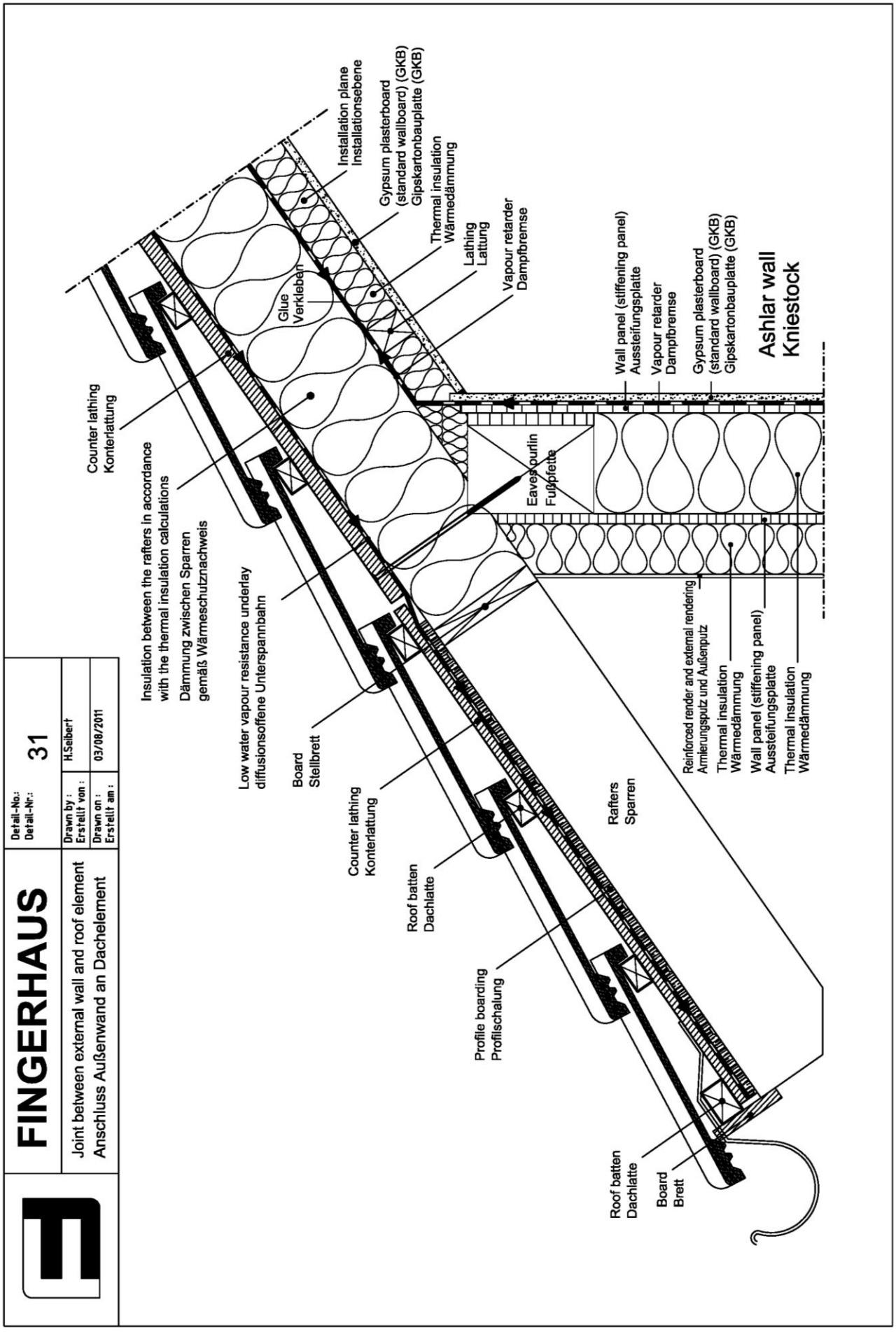

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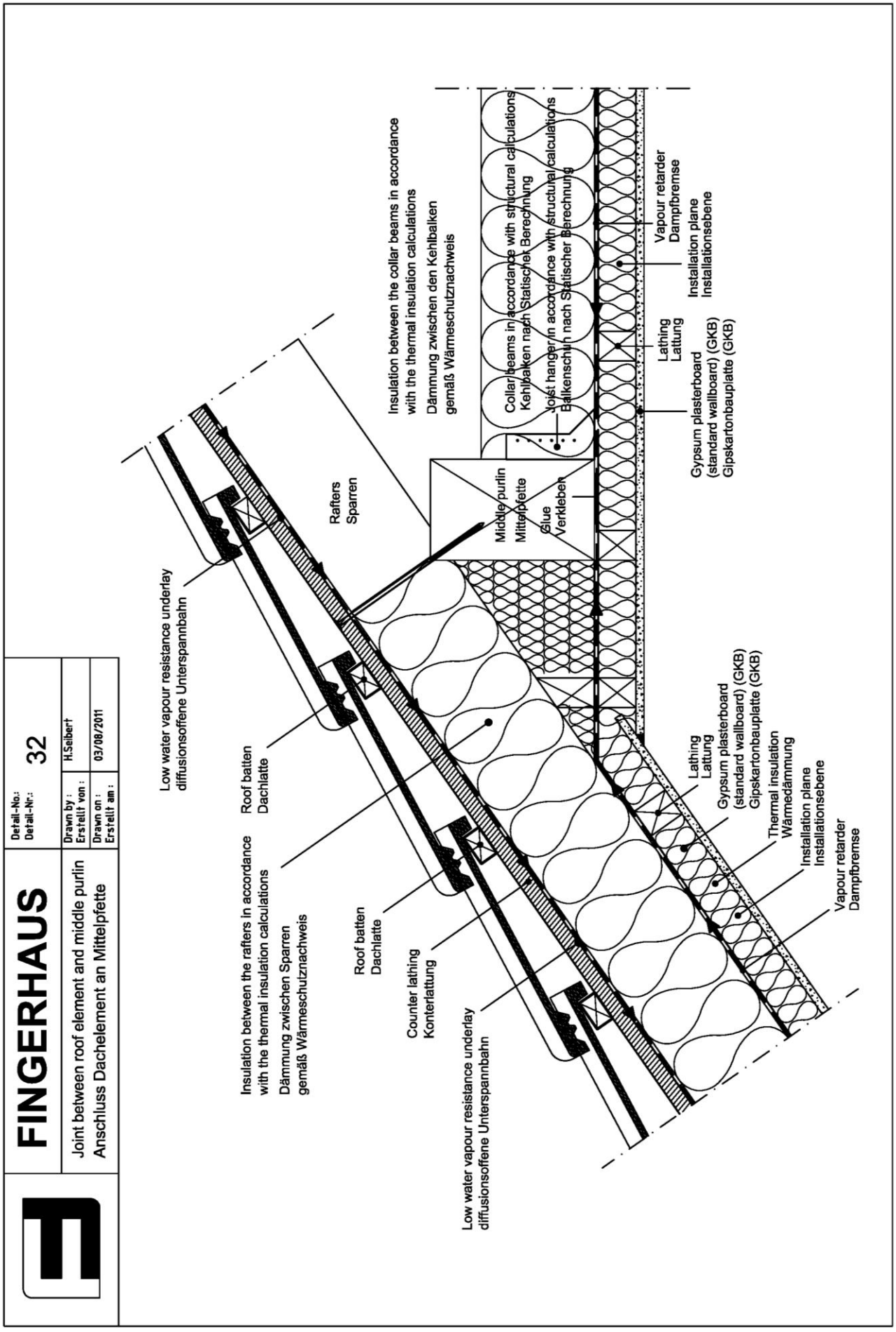

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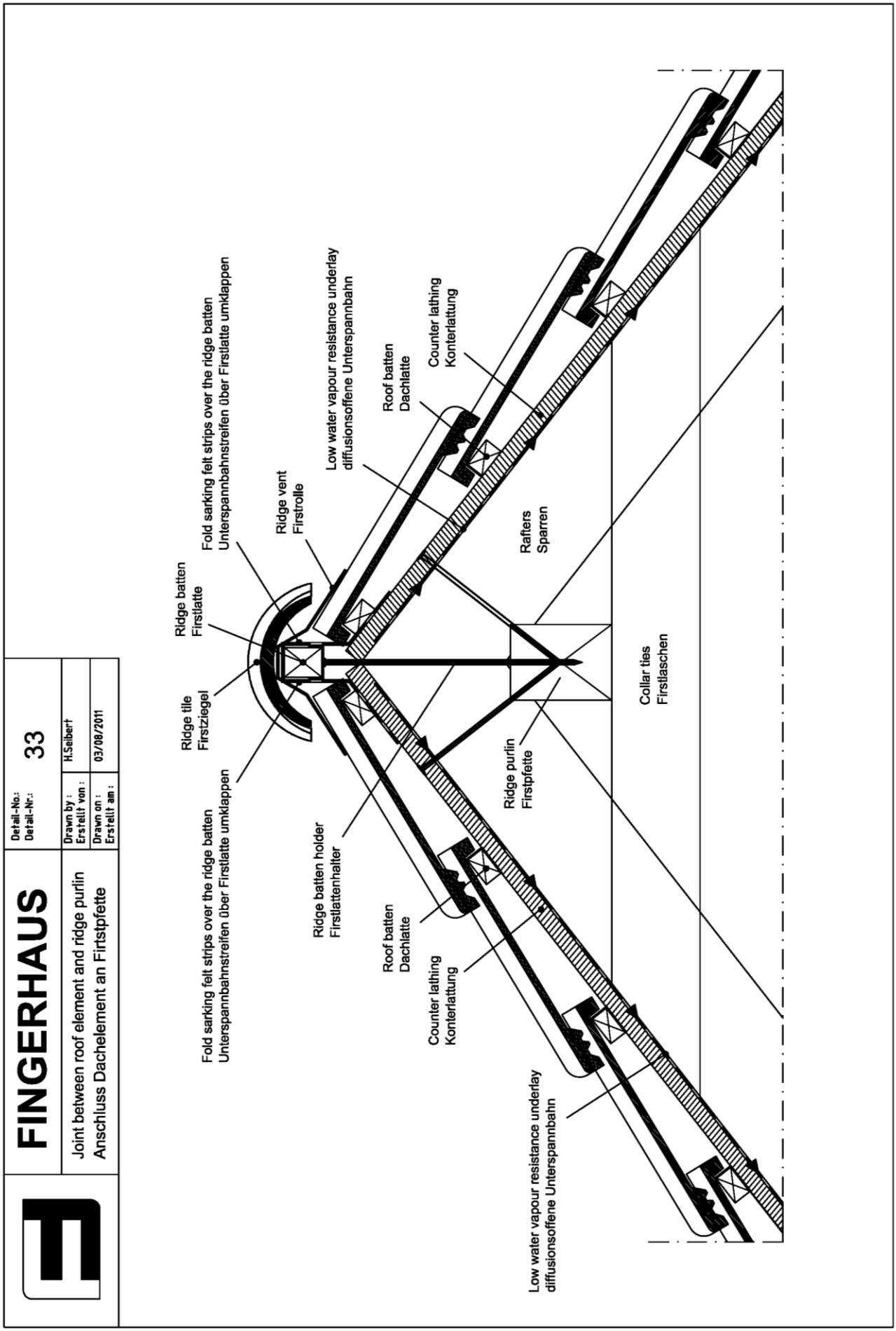

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