

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-16/0053
of 3 August 2023

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

100 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

34-02.03-91611-0

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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 predesigned 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. Windows and exterior doors are generally part of the kit.

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

The company FingerHaus GmbH manufactures timber building kits in skeleton construction, as well. With this type of construction, point loads are carried using statically proven steel or reinforced concrete pillars.

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

The building components are prefabricated and are delivered to the building site as complete elements. Some layers of the kit, like the gypsum board of ceiling and roof elements are mounted on site. Dimensions of elements may vary. The load bearing connections between the building elements in factory production as well as at the assembling on building site are determined with structural designed fasteners as well as system connectors.

For roof coverings usually, concrete tiles according to EN 490¹/491² or clay tiles according to EN 1304³ 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 are mentioned in Annex A, standards referred to, or in 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 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.

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)

1	EN 490:2011	Concrete roofing tiles and fittings for roof covering and wall cladding - Product specifications
2	EN 491:2011	Concrete roofing tiles and fittings for roof covering and wall cladding - Test methods
3	EN 1304:2005	Clay roofing tiles and fittings - Product definitions and specifications

English translation prepared by DIBt

- 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
Resistance, stiffness and stability of wall, floor and roof elements and their connections against vertical and horizontal loads	See Annex A All building components are described with regard to their components and their structure
Shear resistance in plane direction against horizontal loads	No performance assessed (NPA)
Compression resistance - log walls	No performance assessed (NPA)
Settling of construction of log	No performance assessed (NPA)
Corrosion protection of metal fasteners	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.

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire of materials and components	The classification for reaction to fire of materials and 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
Water vapour 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 ⁴ considering relevant design climatic conditions. Particular building elements were calculated according to EN 15026 ⁵ and stated in annex A.
Watertightness	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.
Durability class/ use class	Durability class/ use class see Annex A
Content, emission and/or release of dangerous substances	No performance assessed (NPA)

3.4 Safety and accessibility in use (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.

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.
Impact sound insulation of floors	No performance assessed (NPA)
Sound absorption	No performance assessed (NPA)

⁴ 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

⁵ EN 15026:2007 Hygrothermal performance of building elements - assessment of moisture transfer by numerical simulation

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 ⁶ or EN 13829 ⁷ if necessary.
Thermal inertia	No performance assessed (NPA)

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 Commission⁸, 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 3 August 2023 by Deutsches Institut für Bautechnik

Anja Dewitt
 Head of Section

beglaubigt:
 Vössing

⁶ EN ISO 9972:2013 Thermal performance of buildings - Determination of air permeability of buildings - Fan pressurization method
⁷ EN 13829:2000 Thermal performance of buildings – Determination of air permeability of buildings - Fan pressurization method (ISO 9972:1996 modified)
⁸ Official Journal of the European Communities L 178/56-57 of 14.07.1999

Annex A – Description of the building components

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a) Specification of the technical description

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:

- construction 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.

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 takes place in dry and heated sites and the temporary storage of the components is usually below roofs.

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. Non-load-bearing internal walls can be arranged in any way inside the building. Exterior walls either get external insulation systems according to European Technical Assessments (description see Details B to D in Annex A) or have been designed in accordance with generally recognised rules of construction (description see Details E to K in Annex A). The evidence against lift of, of the wall building components with the substructure shall be provided.

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 ETA 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.

Durability class/ use class

Softwood that fulfils the needs of natural durability of solid wood according to EN 350¹ respective Table 1 is used as construction wood.

Table 1: Classes of natural durability against destructive fungi

Wood Types	Classes of natural durability ^a
Spruce and fir	4
Pine and larch	3-4

a The classes relates to heartwood.

Only technically dried timber with a moisture content up to 20 % is used.

The building components are not treated with chemical wood preservatives.

Table 2: Classification of building components according to EN 335²

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 are only found in certain limited areas in Europe. The assessment of durability in this ETA contains no information about resistance to termites. Use in areas where termites occur is not recommended without appropriate chemical wood protection.

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 1995-1-1³ under consideration of the corrosivity category according to EN ISO 12944-2⁴.

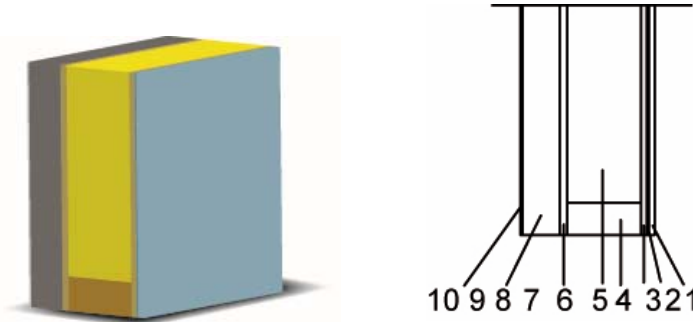
1 EN 350:2016 Durability of wood and wood-based products - Testing and classification of the durability to biological agents of wood and wood-based materials

2 EN 335:2013 Durability of wood and wood-based products - Use classes: definitions, application to solid wood and wood-based products

3 EN 1995-1-1:2004+AC2006+A1:2008+A2:2014 Eurocode 5: Design of timber structures - Part 1-1: General - Common rules and rules for buildings

4 EN ISO 12944-2:2017 Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 2: Classification of environments

b) 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 $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ⁵ (2006/673/EC) B-s1, d0 ⁵ (2006/673/EC)
2	Vapour retarder layer	$\geq 0,2$	EN 13984	E
3.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
4	Timber structure - Stud Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	- Sole plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	I-Joists	$\geq 40 / \geq 90$	ETA-06/0238; ETA-02/0026 ⁶	D-s2, d0 (2003/593/EC)
5	Mineral wool	≥ 90	EN 13162	A1
6.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
6.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
7	Glue: according to ETA	Full-surface application	the whole system ETA-11/0505 ⁷	the whole system E ⁸
8.1	Polystyrene EPS	$\geq 40, \leq 200$		
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 ⁸	A1

⁵ 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.

⁶ Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

⁷ Other ETIC-Systems with ETA in accordance with EAD 040089-00-0404, 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.

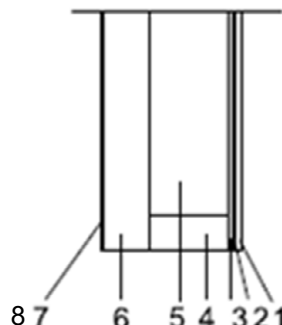
⁸ Proof through ETA.

English translation prepared by DIBt

Fixing devices:											
No.	Construction product	Type	EN-standard					Dimensions Ø / length (mm)	Spacing (mm)		
1	Gypsum board	Staple (or Drywall screw)	EN 14566/A1					1,15 / 22	≤ 150		
3.1 6.1	Particle board alternative OSB	Staple (or Drywall screw)	EN 14592/A1					1,52 / 44	ends ≤ 75 middle ≤ 150		
3.2 6.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14592/A1					1,52 / 44	ends ≤ 75 middle ≤ 150		
8.2	Rock wool	Staple	EN 14592/A1					2,46 / 110	Only for fixing		
Building physics characteristics											
Build-up	Thickness [mm] λ [W/mK]							U-Value EN ISO 6946 [W/m²K] R _{si} = 0,13 R _{se} = 0,04	Vapour diffusion EN 15026	Weighted sound reduction index R _w EN ISO 717-1 [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

c) 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 $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ⁹ (2006/673/EC) B-s1, d0 ⁹ (2006/673/EC)
2	Vapour retarder layer	$\geq 0,2$	EN 13984	E
3.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	$> 9,5$	EN 15283-2	A2-s1, d0
4	Timber structure - Stud Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	- Sole plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	I-Joists	$\geq 40 / \geq 90$	ETA-06/0238; ETA-02/0026 ¹⁰	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 ¹¹	the whole system E ¹²
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		

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.

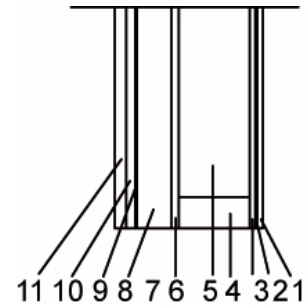
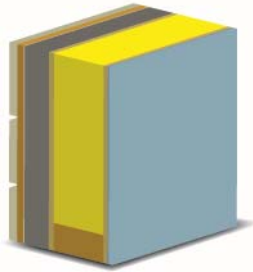
¹⁰ Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

¹¹ 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.

¹² 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			1,15 / 22	≤ 150		
3.1	Particle board alternative OSB		Staple (or Drywall screw)	EN 14592/A1			1,52 / 44	ends ≤ 75 middle ≤ 150		
3.2	Gypsum fibre board		Staple (or Drywall screw)	EN 14592/A1			1,52 / 44	ends ≤ 75 middle ≤ 150		
6	Wood-fibre insulation board		Staple	EN 14592/A1			1,55 / 110	≤ 100		
Building physics characteristics										
Build-up	Thickness [mm] λ [W/mK]						U-Value EN ISO 6946 [W/m²K] R _{si} = 0,13 R _{se} = 0,04	Vapour diffusion EN 15026	Weighted sound reduction index R _w EN ISO 717-1 [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	-	-	

d) EW_Timber façade



Construction build-up: (from the inside outwards)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ¹³ (2006/673/EC) B-s1, d0 ¹³ (2006/673/EC)
2	Vapour retarder layer	$\geq 0,2$	EN 13984	E
3.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
4	Timber structure - Stud Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
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6.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
6.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
7	Glue: according to ETA 11/0505	approx. 1	ETA-11/0505	E
8.1	Polystyrene EPS	$\geq 40, \leq 200$	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 $\geq 350 \text{ kg/m}^3$	$\geq 20 / \geq 40$	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
10	Low water vapour resistance underlay	$\geq 0,5$	EN 13859	E
11	Wooden cladding Density $\geq 350 \text{ kg/m}^3$	≥ 15	EN 338 EN 14081	D-s2, d0 (2003/593/EC)

¹³ 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.

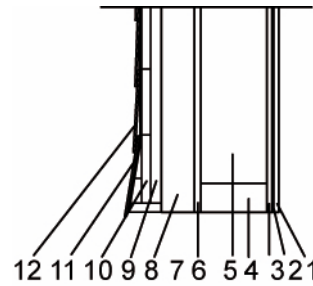
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No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)					
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3.1 6.1	Particle board alternative OSB	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150					
3.2 6.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	Ends ≤ 75 middle ≤ 150					
8.2	Wood-fibre insulation board	Staple (or Drywall screw)	EN 14592/A1	1,55 / 110	≤ 100					
8.3	Rock wool	Staple	EN 14592/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] R _{si} = 0,13 R _{se} = 0,04	Vapour diffusion EN 15026	Weighted sound reduction index R _w EN ISO 717-1 [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

e) EW_Slate



Construction build-up: (from the inside outwards)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ¹⁵ (2006/673/EC) B-s1, d0 ¹⁵ (2006/673/EC)
2	Vapour retarder layer	$\geq 0,2$	EN 13984	E
3.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
4	Timber structure - Stud, Head/ Sole plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	I-Joists	$\geq 40 / \geq 90$	ETA-06/0238; ETA-02/0026 ¹⁶	D-s2, d0 (2003/593/EC)
5	Mineral wool	≥ 90	EN 13162	A1
6.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
6.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
7	Glue: according to ETA 11/0505	Full-surface application	ETA-11/0505	E
8.1	Polystyrene EPS	$\geq 40, \leq 200$	EN 13163	E
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 $\geq 350 \text{ kg/m}^3$	$\geq 20 / \geq 40$	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
10	Wooden cladding Density $\geq 350 \text{ kg/m}^3$	≥ 15	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
11	Bitumen sheet	-	EN 13707	E
12	Slate cladding* ¹⁷	-	EN 492	see product specification

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 Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

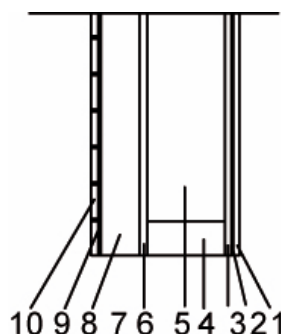
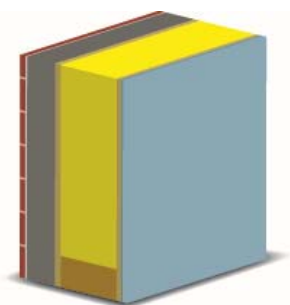
¹⁷ With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

English translation prepared by DIBt

Fixing devices:										
No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)					
1	Gypsum board	Staple (or Drywall screw)	EN 14566/A1	1,15 / 22	≤ 150					
3.1 6.1	Particle board alternative OSB	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150					
3.2 6.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150					
8.2	Wood-fibre insulation board	Staple	EN 14592/A1	1,55 / 110	≤ 100					
8.3	Rock wool	Staple	EN 14592/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] R _{si} = 0,13 R _{se} = 0,04	Vapour diffusion EN 15026	Weighted sound reduction index R _w EN ISO 717-1 [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

f) EW_Brick slips



Construction build-up: (from the inside outwards)				
No.	Construction product	Dimensions [mm]	EN-standard	Reaction to fire
1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ¹⁸ (2006/673/EC) B-s1, d0 ¹⁸ (2006/673/EC)
2	Vapour retarder sheet	$\geq 0,2$	EN 13984	E
3.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A A2-s1, d0
4	Timber structure - Stud Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	- Sole plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	I-Joists	$\geq 40 / \geq 90$	ETA-06/0238; ETA-02/0026 ¹⁹	D-s2, d0 (2003/593/EC)
5	Mineral wool	≥ 90	EN 13162	A1
6.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
6.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A A2-s1, d0
7	Glue	Full-surface application	the whole system Z-33.47-1529	the whole system E
8	Polystyrene EPS	$\geq 40, \leq 200$		
9	Plaster with reinforcement	1,8 up to 3,5		
10.1	Adhesive for brick slips* ²⁰	Approx. 3	EN 12004	see product specification
10.2	Brick slips* ²⁰	Approx. 15	EN 14411	

¹⁸ 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.

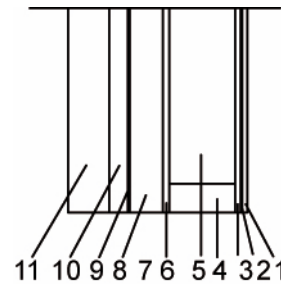
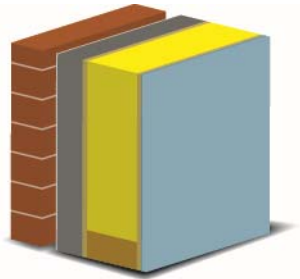
¹⁹ Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

²⁰ 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	1,15 / 22	≤ 150					
3.1 6.1	Particle board alternative OSB	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150					
3.2 6.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150					
Building physics characteristics										
Build-up	Thickness [mm] λ [W/mK]							U-Value EN ISO 6946 [W/m²K] R _{si} = 0,13 R _{se} = 0,04	Vapour diffusion EN 15026	Weighted sound reduction index R _w EN ISO 717-1 [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

g) 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 $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ²¹ (2006/673/EC) B-s1, d0 ²¹ (2006/673/EC)
2	Vapour retarder sheet	$\geq 0,2$	EN 13984	E
3.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986; EN 312; EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
4	Timber structure - Stud Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	- Sole plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	I-Joists	$\geq 40 / \geq 90$	ETA-06/0238; ETA-02/0026 ²²	D-s2, d0 (2003/593/EC)
5	Mineral wool	≥ 90	EN 13162	A1
6.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
6.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
7	Glue	Full-surface application	ETA-11/0505	E
8.1	Polystyrene EPS	$\geq 40, \leq 200$		
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)	$\geq 0,5$	EN 13859	E
10	Air gap ^{*23}	≥ 30	EN 711-1	see product specification
11	Clinker ^{*23}	≥ 90		

²¹ 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.

²² Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

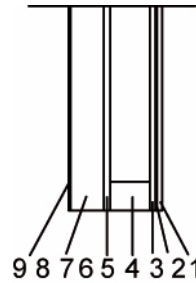
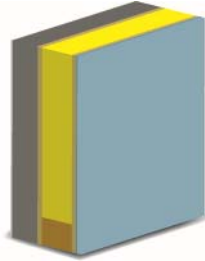
²³ With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

English translation prepared by DIBt

Fixing devices:										
No.	Construction product		Type		EN-standard		Dimensions Ø / length (mm)		Spacing (mm)	
1	Gypsum board		Staple (or Drywall screw)		EN 14566/A1		1,15 / 22		≤ 150	
3.1 6.1	Particle board alternative OSB		Staple (or Drywall screw)		EN 14592/A1		1,52 / 44		ends ≤ 75 middle ≤ 150	
3.2 6.1	Gypsum fibre board		Staple (or Drywall screw)		EN 14592/A1		1,52 / 44		ends ≤ 75 middle ≤ 150	
8.2	Wood-fibre insulation board		Staple		EN 14592/A1		1,55 / 110		≤ 100	
8.3	Rock wool		Staple		EN 14592/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] R _{si} = 0,13 R _{se} = 0,04	Vapour diffusion EN 15026	Weighted sound reduction index R _w EN ISO 717-1 [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:
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 - 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

h) EW_Free standing garage



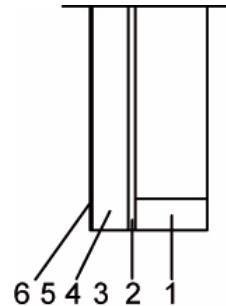
Construction build-up: (from the inside outwards)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Gypsum fibre board	≥ 9,5	EN 15283-2	A2-s1, d0
2	Vapour retarder sheet	≥ 0,2	EN 13984	E
3.1	Particle board alternative OSB Density ≥ 600 kg/m ³	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	≥ 9,5	EN 15283-2	A2-s1, d0
4	Timber structure - Stud Density ≥ 350 kg/m ³	≥ 40 / ≥ 90	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m ³	≥ 40 / ≥ 90		
	- Sole plate Density ≥ 350 kg/m ³	≥ 40 / ≥ 90		
	I-Joists	≥ 40 / ≥ 90	ETA-06/0238; ETA-02/0026 ²⁴	D-s2, d0 (2003/593/EC)
5.1	Particle board alternative OSB 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	EN 15283-2	A2-s1, d0
6	Glue in accordance with the respective ETA	Full-surface application	the whole system ETA-11/0505 ²⁵	the whole system C-s2, d0
7.1	Polystyrene 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 ²⁵	the whole system C-s1, d0; B-s1, d0
7.3	Rock wool	≥ 40	the whole system ETA-07/0088 ²⁵	A1

²⁴ Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

²⁵ 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	1,15 / 22	≤ 150
3.1 5.1	Particle board alternative OSB	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150
3.2 5.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150
7.2	Wood-fibre insulation board	Staple	EN 14592/A1	1,55 / 110	≤ 100
7.3	Rock wool	Staple	EN 14592/A1	2,46 / 110	Only for fixing

i) EW_Without finishings



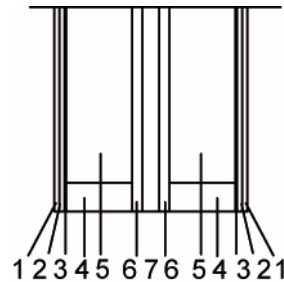
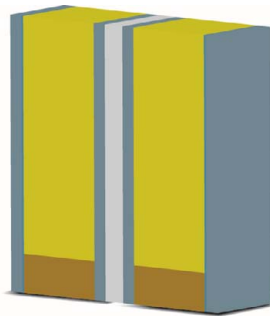
Construction build-up: (from the inside outwards)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Timber structure - Stud Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	- Sole plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	I-Joists	$\geq 40 / \geq 90$	ETA-06/0238; ETA-02/0026 ²⁶	D-s2, d0 (2003/593/EC)
2.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
3	Glue in accordance with the respective ETA	Full-surface application	the whole system ETA-11/0505 ²⁷	the whole systems C-s2, d0
4.1	Polystyrene 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 ²⁷	the whole system layers 4.2, 5 and 6 C-s1,d0
4.3	Rock wool	≥ 40	the whole system ETA-07/0088 ²⁷	A1

²⁶ Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

²⁷ 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	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150
2.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150
4.2	Wood-fibre insulation board	Staple	EN 14592/A1	1,55 / 110	≤ 100
4.3	Rock wool	Staple	EN 14592/A1	2,46 / 110	Only for fixing

j) EW_Party wall

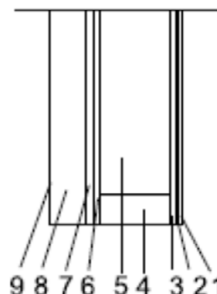
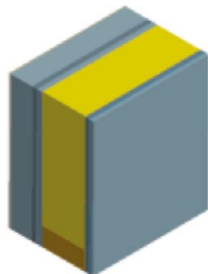


Construction build-up: (from the inside outwards)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1.1	Gypsum fibre board	≥ 9,5	EN 15283-2	A2-s1, d0
1.2	Gypsum fire protection board Density ≥ 800 kg/m ³	≥ 9,5	EN 520, Typ DF	A2-s1, d0
2	Vapour retarder sheet	≥ 0,2	EN 13984	E
3.1	Gypsum fibre board	≥ 9,5	EN 15283-2	A2-s1, d0
3.2	Gypsum fire protection board Density ≥ 800 kg/m ³	≥ 9,5	EN 520, Typ DF	A2-s1, d0
3.3	Particle board alternative OSB 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 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density ≥ 350 kg/m ³	≥ 40 / ≥ 90		
	- Sole plate Density ≥ 350 kg/m ³	≥ 40 / ≥ 90		
	I-Joists	≥ 40 / ≥ 90	ETA-06/0238; ETA-02/0026 ²⁸	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	EN 15283-2	A2-s1, d0
6.2	Gypsum fire protection board Density ≥ 800 kg/m ³	≥ 9,5	EN 520, Typ DF	A2-s1, d0
7	Air gap	-	-	-
	Further build-up mirror-inverted! Compare draft			

²⁸ Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

Fixing devices:										
No.	Construction product		Type	EN-standard			Dimensions Ø / length (mm)	Spacing (mm)		
1.1	Gypsum fibre board		Staple (or Drywall screw)	EN 14566/A1			1,15 / 22	≤ 150		
1.2	Gypsum fire protection board									
3.1	Gypsum fibre board		Staple (or Drywall screw)	EN 14592/A1			1,52 / 44	ends		
3.2	Gypsum fire protection board							≤ 75		
6.1	Gypsum fibre board							middle		
6.2	Gypsum fire protection board							≤ 150		
Building physics characteristics										
Build-up	Thickness [mm] λ [W/mK]						U-Value EN ISO 6946 [W/m²K] R _{si} = 0,13 R _{se} = 0,04	Vapour diffusion EN 15026	Weighted sound reduction index R _w EN ISO 717-1 [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	

k) 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 Density $\geq 800 \text{ kg/m}^3$	$\geq 9,5$	EN 520, Typ DF	A2-s1, d0
2	Vapour retarder sheet	$\geq 0,2$	EN 13984	E
3.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
3.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
4	Timber structure - Stud Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 40$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 40$		
	- Sole plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 40$		
	I-Joists	$\geq 40 / \geq 90$	ETA-06/0238; ETA-02/0026 ²⁹	D-s2, d0 (2003/593/EC)
5	Mineral wool	≥ 40	EN 13162	A1
6.1	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
6.2	Gypsum fire protection board Density $\geq 800 \text{ kg/m}^3$	≥ 18	EN 520, Typ DF	A2-s1, d0
7.1	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
7.2	Gypsum fire protection board Density $\geq 800 \text{ kg/m}^3$	≥ 18	EN 520, Typ DF	A2-s1, d0
	Glue according to	Full-surface application	the whole system ETA 07/0088 ³⁰	the whole system C-s2,d0
8	Rock wool	≥ 40		
9	Plaster with reinforcement	approx. 3,5		

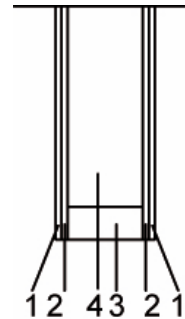
²⁹ Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

³⁰ 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	1,15 / 22			≤ 150		
3.1	Particle board alternative OSB			Staple (or Drywall screw)	EN 14592/A1	1,52 / 44			ends ≤ 75 middle ≤ 150		
3.2 6.1 7.1	Gypsum fibre board			Staple (or Drywall screw)	EN 14592/A1	1,52 / 44			ends ≤ 75 middle ≤ 150		
6.2 7.2	Gypsum fire protection board			Staple (or Drywall screw)	EN 14592/A1	1,52 / 44			ends ≤ 75 middle ≤ 150		
8	Rock wool			Staple (or Drywall screw)	EN 14592/A1	2,46 / 110			Only for fixing		
Building physics characteristics											
Build-up	Thickness [mm]								U-Value EN ISO 6946 [W/m ² K] R _{si} = 0,13 R _{se} = 0,04	Vapour diffusion EN 15026	Weighted sound reduction index R _w EN ISO 717-1 [dB]
	λ [W/mK]										
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

I) IW_FingerHaus current standard internal wall



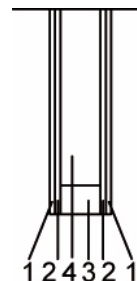
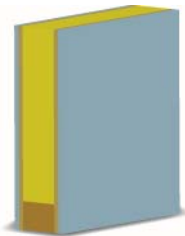
Construction build-up: (from right to left side)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	12,5	EN 520	A2-s1, d0 ³¹ (2006/673/EC) B-s1, d0 ³¹ (2006/673/EC)
2.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
3	Timber structure - Stud Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	- Sole plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	I-Joists	$\geq 40 / \geq 90$	ETA-06/0238; ETA-02/0026 ³²	D-s2, d0 (2003/593/EC)
4	Mineral wool	≥ 60	EN 13162	A1
2.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	12,5	EN 520	A2-s1, d0 ³¹ (2006/673/EC) B-s1, d0 ³¹ (2006/673/EC)

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 Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

Fixing devices:					
No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1	Gypsum board	Staple (or Drywall screw)	EN 14566/A1	1,15 / 22	≤ 150
2.1	Particle board alternative OSB	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150
2.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150

m) 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 $\geq 600 \text{ kg/m}^3$	≥ 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	EN 15283-2	A2-s1, d0
2.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
3	Timber structure - Stud Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 40$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 40$		
	- Sole plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 40$		
	I-Joists	$\geq 40 / \geq 90$	ETA-06/0238; ETA-02/0026 ³⁴	D-s2, d0 (2003/593/EC)
4	Mineral wool	≥ 30	EN 13162	A1
2.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
1.1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ³³ (2006/673/EC) B-s1, d0 ³³ (2006/673/EC)
1.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0

³³

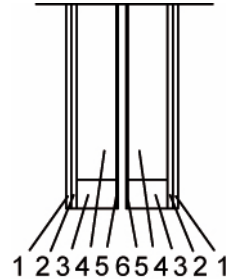
The reaction to fire of the gypsum board depends on the paper weight. The reaction to fire of the gypsum core is Euro class A1.

³⁴

Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

Fixing devices:					
No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
1.1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	Staple (or Drywall screw)	EN 14566/A1	1,15 / 22	≤ 150
1.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14566/A1	1,15 / 22	≤ 150
2.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150
2.1	Particle board alternative OSB	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150

n) IW_Apartment party wall



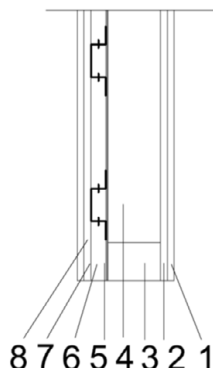
Construction build-up: (from the inside outwards)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1.1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ³⁵ (2006/673/EC) B-s1, d0 ³⁵ (2006/673/EC)
1.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
2.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
3	Timber structure - Stud Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	- Sole plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$		
	I-Joists	$\geq 40 / \geq 90$	ETA-06/0238; ETA-02/0026 ³⁶	D-s2, d0 (2003/593/EC)
4	Mineral wool	≥ 90	EN 13162	A1
5	Low water vapour resistance underlay	$\geq 0,5$	EN 13859	E
6	Air	approx. 20	--	--
	Further build-up mirror- inverted! Compare draft			

³⁵ 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.

³⁶ Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

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	1,15 / 22		≤ 150
1.2	Gypsum fibre board		Staple (or Drywall screw)		EN 14566/A1	1,15 / 22		≤ 150
2.1	Particle board alternative OSB		Staple (or Drywall screw)		EN 14592/A1	1,52 / 44		ends ≤ 75 middle ≤ 150
2.2	Gypsum fibre board		Staple (or Drywall screw)		EN 14592/A1	1,52 / 44		ends ≤ 75 middle ≤ 150
Building physics characteristics								
Build-up	Thickness [mm] λ [W/mK]							Weighted sound reduction index R_w EN ISO 717-1 [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

o) 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 $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ³⁷ (2006/673/EC) B-s1, d0 ³⁷ (2006/673/EC)
1.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
2.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
3	Timber structure - Stud Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 40$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 40$		
	- Sole plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 40$		
	I-Joists	$\geq 40 / \geq 90$	ETA-06/0238; ETA-02/0026 ³⁸	D-s2, d0 (2003/593/EC)
4	Mineral wool	≥ 30	EN 13162	A1
5	Low water vapour resistance underlay	$\geq 0,5$	EN 13859	E
6	Resilient bars	$\geq 20 / \geq 50$	EN 14195	A2
7.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
7.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
8.1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ³⁷ (2006/673/EC) B-s1, d0 ³⁷ (2006/673/EC)
8.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0

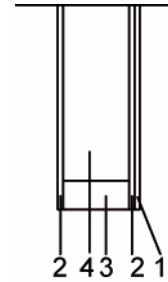
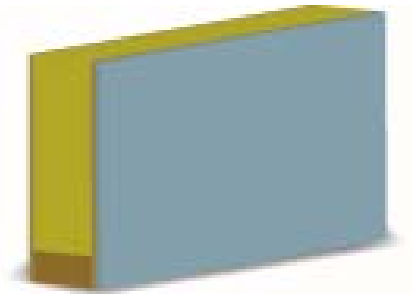
³⁷

³⁸

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. Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

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	1,15 / 22			≤ 150	
1.2	Gypsum fibre board		Staple (or Drywall screw)	EN 14566/A1	1,15 / 22			≤ 150	
2.1	Particle board alternative OSB		Staple (or Drywall screw)	EN 14592/A1	1,52 / 44			ends ≤ 75 middle ≤ 150	
2.2	Gypsum fibre board		Staple (or Drywall screw)	EN 14592/A1	1,52 / 44			ends ≤ 75 middle ≤ 150	
6	Resilient bars		Drywall screw	EN 14566/A1	3,9 / 30			2 items ≤ 625	
7.1	Particle board alternative OSB		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 EN ISO 717-1 [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

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



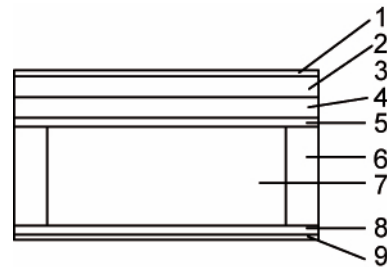
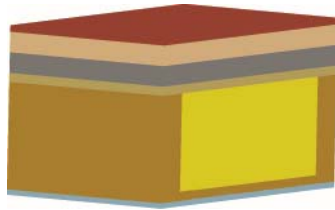
Construction build-up: (from the inside outwards)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1.1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ³⁹ (2006/673/EC) B-s1, d0 ³⁹ (2006/673/EC)
1.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
2.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0
3	Timber structure - Stud Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 40$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	- Head plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 40$		
	- Sole plate Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 40$		
	I-Joists	$\geq 40 / \geq 90$		
4	Mineral wool	≥ 30	EN 13162	A1
2.1	Particle board alternative OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
2.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0

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 Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

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	1,15 / 22	≤ 150
1.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14566/A1	1,15 / 22	≤ 150
2.2	Gypsum fibre board	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150
2.1	Particle board alternative OSB	Staple (or Drywall screw)	EN 14592/A1	1,52 / 44	ends ≤ 75 middle ≤ 150

q) 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* ⁴¹	--		
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 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 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
	I-Joists	≥ 40 / ≥ 240	ETA-06/0238; ETA-02/0026 ⁴²	D-s2, d0 (2003/593/EC)
7	Mineral wool	≥ 120	EN 13162	A1
8	Timber structure	≥ 21 / 70	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
9.1	gypsum fire protection board Density ≥ 800 kg/m ³	≥ 12,5	EN 520, Typ DF	A2-s1, d0 ⁴³ (2006/673/EC) B-s1, d0 ⁴³ (2006/673/EC)
9.2	Gypsum fibre board	≥ 9,5	EN 15283-2	A2-s1, d0

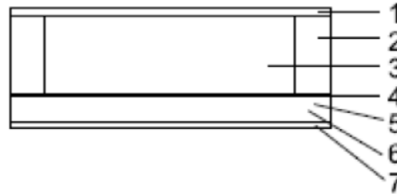
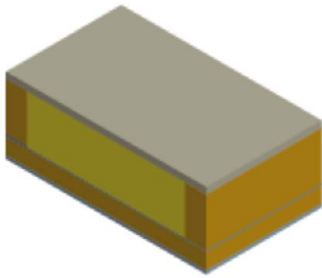
⁴¹ With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

⁴² Other I-Joists with ETA in accordance with EAD 130367-00-0304, may as well be used. These I-Joists shall be suitable for the present building kit.

⁴³ 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.

Fixing devices:					
No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
5	Particle board alternative OSB	Staple (or nail)	EN 14592/A1	1,52 / 44	-
8	Timber structure - support for planking	Staple (or nail)	EN 14592/A1	1,52 / 44	-
9.1	Gypsum fire protection 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

r) FC_External ceiling or floor / collar beam ceiling

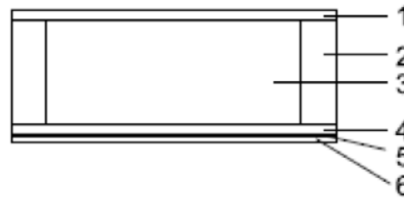
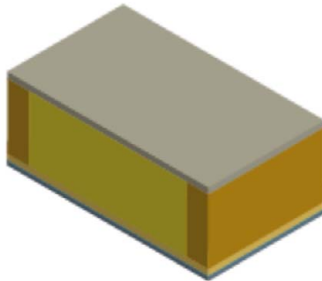


Construction build-up: (from the top down)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Timber cladding Density $\geq 350 \text{ kg/m}^3$	$\geq 20 / \geq 80$	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
2	Timber structure - Beam Density $\geq 350 \text{ kg/m}^3$	$\geq 20 / \geq 180$	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
3	Mineral wool	≥ 40	EN 13162	A1
4	Vapour retarder sheet	$\geq 0,2$	EN 13984	E
5	Timber substructure Density $\geq 350 \text{ kg/m}^3$	$\geq 20 / \geq 40$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
6	Mineral wool	≥ 40	EN 13162	A1
7.1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ⁴⁴ (2006/673/EC) B-s1, d0 ⁴⁴ (2006/673/EC)
7.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0

Fixing devices:										
No.	Construction product	Type	EN-standard					Dimensions Ø / length (mm)	Spacing (mm)	
1	Timber	Staple (or Nails)	EN 14592/A1					1,52 / 44	-	
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/m ² K] R_{si} = 0,13 R_{se} = 0,04	Vapour diffusion EN 15026	Weighted sound reduction index R _w EN ISO 717-1 [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

s) FC_External ceiling or floor

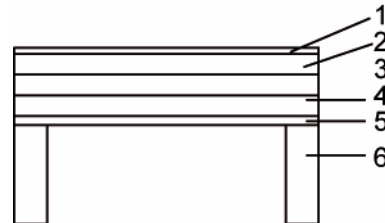
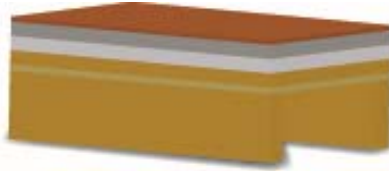


Construction build-up: (from the top down)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Timber cladding Density $\geq 350 \text{ kg/m}^3$	$\geq 20 / \geq 80$	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
2	Timber structure - Beam Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 180$	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	D-s2, d0 (2003/593/EC)
3	Mineral wool	≥ 40	EN 13162	A1
4	Open formwork Density $\geq 350 \text{ kg/m}^3$	$\geq 20 / \geq 50$	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
5	Vapour retarder sheet	$\geq 0,2$	EN 13984	E
6.1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ⁴⁵ (2006/673/EC) B-s1, d0 ⁴⁵ (2006/673/EC)
6.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0

Fixing devices										
No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)						Spacing (mm)
1	Timber cladding	Staple (or Nails)	EN 14592/A1	1,52 / 44						-
4	Open formwork	Staple (or Nails)	EN 14592/A1	1,52 / 44						-
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/m ² K] $R_{si} = 0,13$ $R_{se} = 0,04$	Vapour diffusion EN 15026	Weighted sound reduction index R_w EN ISO 717-1 [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

t) FC_Open wooden joist floor/ceiling

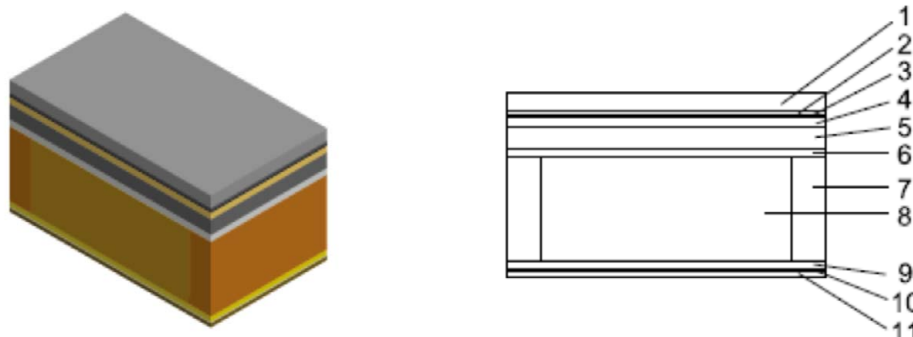


Construction build-up: (from the top down)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Flooring as chosen by owner* ⁴⁶	--		
2.1	Cementitious screed	≥ 30	EN 13813	E(2010/85/EG)
2.2	Anhydrite screed	≥ 30	EN 13813	E(2010/85/EG)
3	Separating sheeting	approx. 0,2	EN 13859	E
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 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	D-s2, d0 (2003/593/EC)
6	Timber structure - Beam Density ≥ 350 kg/m ³	≥ 40 / ≥ 90	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	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	Staple (or Nails)	EN 14592/A1	1,52 / 44	-
5.2	Matchboards	Staple (or Nails)	EN 14592/A1	1,52 / 44	-

⁴⁶ 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).

u) 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* ⁴⁷	--		
2	Substructure* ⁴⁷	--		
3	Waterproofing sheet	approx. 2	EN 13859	E
4	Rough tongue & groove boards	≥ 18 / ≥ 90	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
5.1	Timber sloped wedges Density ≥ 350 kg/m ³	≥ 1 / ≥ 90	EN 338 EN 14081	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 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	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 14374; EN 14080; EN 14081; EN 15497	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 ⁴⁸ (2006/673/EC) B-s1, d0 ⁴⁸ (2006/673/EC)
11.2	Gypsum fibre board	≥ 9.5	EN 15283-2	A2-s1, d0

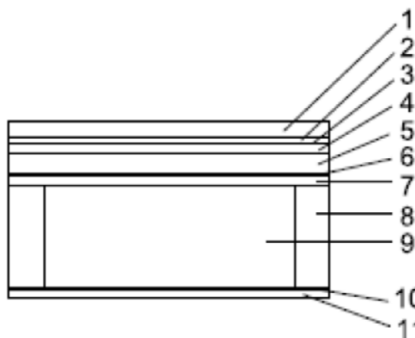
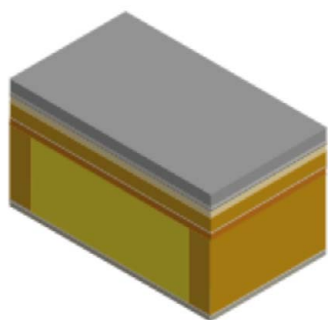
⁴⁷ With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

⁴⁸ 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.

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	1,52 / 44			-			
5.1	Timber sloped wedges			Staple (or Nails)	EN 14592/A1	1,52 / 44			-			
6	Particle board, alternative OSB			Staple (or Nails)	EN 14592/A1	1,52 / 44			-			
9	Timber structure			Staple (or Nails)	EN 14592/A1	1,52 / 44			-			
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/m ² K] $R_{si} = 0,13$ $R_{se} = 0,04$	Vapour diffusion EN 15026	Weighted sound reduction index R_w EN ISO 717-1 [dB]
Layer No.	3	4	5.1	6	7	8	9	10	11.1			
Balcony over heated room 240	>0,1 -	22 0,1 3	-	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

v) C Ceiling under balcony (cantilever)



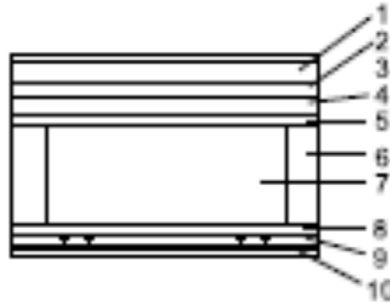
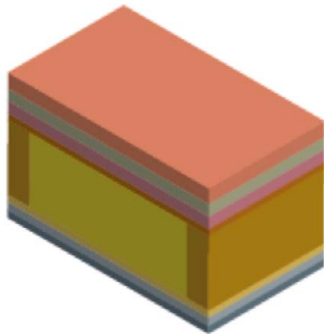
Construction build-up: (from the top down)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Flooring ^{*49}	--		
2	Substructure ^{*49}	--		
3	Sheets for waterproofing	approx. 0.2	EN 13859	E
4	Rough tongue & groove boards	≥ 18 / ≥ 90	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
5.1	Timber slope wedges Density ≥ 350 kg/m ³	≥ 1 / ≥ 90	EN 338 EN 14081	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 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	EN 338; EN 14374; EN 14080; EN 14081; EN 15497	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	D-s2, d0 (2003/593/EC)
11.2	Lightweight concrete boards	≥ 12,5	ETA-07/0087 ⁵⁰	A1

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 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	1,52 / 44	-
5.1	Timber slope wedges Density $\geq 350 \text{ kg/m}^3$	Staple (or Nails)	EN 14592/A1	1,52 / 44	-
7	Particle board, alternative OSB	Staple (or Nails)	EN 14592/A1	1,52 / 44	-
11.1	Matchboards	Staple (or Nails)	EN 14592/A1	1,52 / 44	-
11.2	Lightweight concrete boards	Drywall screw (or Staple)	-	-	-

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



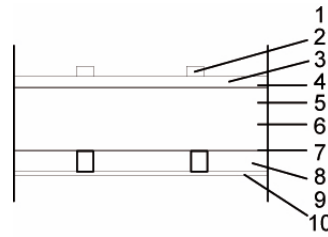
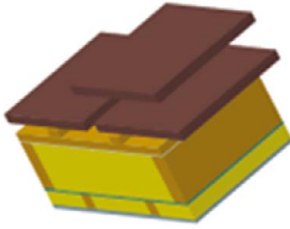
Construction build-up: (from the top down)				
No.	Construction product	Construction product	EN-Standard	Reaction to fire
1	Flooring as chosen by owner* ⁵¹	--		
2.1	Cementitious screed	≥ 30	EN 13813	E(2010/85/EG)
2.2	Anhydrite screed	≥ 30	EN 13813	E(2010/85/EG)
3	Separating sheeting	approx. 0.2	EN 13859	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 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 14374; EN 14080; EN 14081; EN 15497	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	D-s2, d0 (2003/593/EG)
9	Spring rods	27 (60/70)	EN 14195	A1 (96/603/EC)
10.1	2x Gypsum board Density ≥ 600 kg/m ³	≥ 9,5	EN 520	A2-s1, d0 ⁵² (2006/673/EG) B-s1, d0 ⁵² (2006/673/EC)
10.2	2x Gypsum fibre board	≥ 9,5	EN 15283-2	A2-s1, d0

⁵¹ 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).

⁵² 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.

Fixing devices					
No.	Construction product	Type	EN-standard	Dimensions Ø / length (mm)	Spacing (mm)
5	Particle board, alternative OSB	Staple (or Nails)	EN 14592/A1	1,52 / 44	-
8	Open formwork	Staple (or Nails)	EN 14592/A1	1,52 / 44	-
9	Spring rods	TPS-Federclip	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

x) RF_FingerHaus current standard roof



Construction build-up: (from the top down)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Roofing* ⁵³	--		
2	Cross joists	≥ 30/ ≥ 50	EN 338	D-s2, d0 (2003/593/EC)
3	Counter lathing	≥ 20/ ≥ 40	EN 338 EN 14081	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	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	≥ 40/ ≥ 60	EN 338 EN 14081	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 ⁵⁴ (2006/673/EC) B-s1, d0 ⁵⁴ (2006/673/EC)
10.2	Gypsum fibre board	≥ 9,5	EN 15283-2	A2-s1, d0

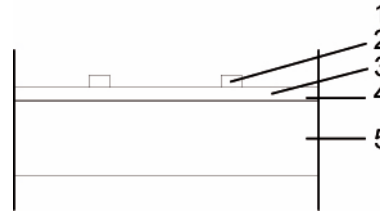
⁵³ With asterisks marked building components are not part of the kit, they are needed to complete building components and they'll be mounted on site (place of use).

⁵⁴ 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.

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/m ² K] $R_{si} = 0,13$ $R_{se} = 0,04$	Vapour diffusion EN 15026	Weighted sound reduction index R_w EN ISO 717-1 [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

y) RF_Non-habitable space

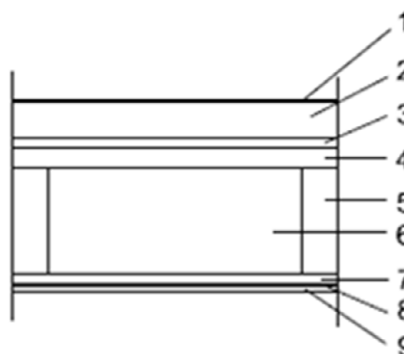
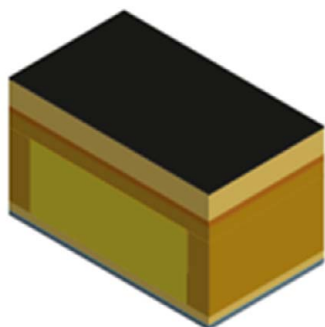


Construction build-up: (from the top down)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Roofing* ⁵⁵	--		
2	Cross joists	≥ 20 / ≥ 30	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
3	Counter lathing	≥ 20 / ≥ 40	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
4	Underlay	--	EN 13859	E
5	Timber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

z) RF_flat roof



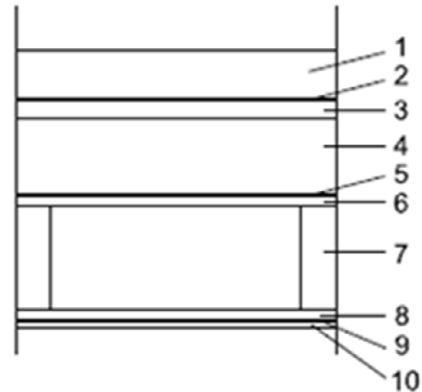
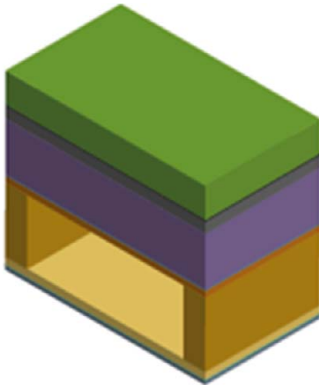
Construction build-up: (from the top down)				
No.	Construction product	Dimensions [mm]	EN standard	Reaction to fire
1	Roof waterproofing	1.5	EN 13956	E
2	Sloped insulation	40 – 200	EN 13163	B1
3	Particle board, alternative: OSB Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EC)
4	Timber structure - Beam Density $\geq 350 \text{ kg/m}^3$ (ventilation)	$\geq 40 / \geq 60$	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
5	Timber structure - Beam Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
6	Mineral wool	≥ 20	EN 13162	A1
7	Timber structure - support for planking	$\geq 20 / \geq 40$	EN 338 EN 14081	D-s2, d0 (2003/593/EC)
8	Vapour retarder sheet	0.2	EN 13984	E
9.1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	≥ 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	EN 15283-2	A2-s1, d0

English translation prepared by DIBt

Fixing devices:												
No.	Construction product			Type	EN-standard	Dimensions Ø / length (mm)		Spacing (mm)				
3	Particle board, Alternative: OSB			Staple (or Drywall screw)	EN 14592/A1	1,52 / 44		-				
7	Timber structure - support for planking			Staple (or Drywall screw)	EN 14592/A1	1,52 / 44		-				
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] R _{si} = 0,13 R _{se} = 0,04	Vapour diffusion EN 15026	Weighted sound reduction index R _w EN ISO 717-1 [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

aa) 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* ⁵⁷ (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 Density $\geq 600 \text{ kg/m}^3$	≥ 12	EN 13986 EN 312 EN 300	D-s2, d0 (2007/348/EG)
7	Timber structure - Beam Density $\geq 350 \text{ kg/m}^3$	$\geq 40 / \geq 90$	EN 338 EN 14081	D-s2, d0 (2003/593/EG)
8	Timber structure - support for planking	$\geq 20 / \geq 40$	EN 338 EN 14081	D-s2, d0 (2003/593/EG)
9	Sheets for air tightness	$\geq 0,2$	EN 13984	E
10.1	Gypsum board Density $\geq 600 \text{ kg/m}^3$	$\geq 9,5$	EN 520	A2-s1, d0 ⁵⁸ (2006/673/EG) B-s1, d0 ⁵⁸ (2006/673/EG)
10.2	Gypsum fibre board	$\geq 9,5$	EN 15283-2	A2-s1, d0

⁵⁷ 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).

⁵⁸ 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.

Fixing devices:												
No.	Construction product			Type	EN-standard			Dimensions Ø / length (mm)		Spacing (mm)		
6	Particle board, alternative: OSB			Staple (or Drywall screw)	EN 14592/A1			1,52 / 44		-		
8	Timber structure - support for planking			Staple (or Drywall screw)	EN 14592/A1			1,52 / 44		-		
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/m ² K] R_{si} = 0,13 R_{se} = 0,04	Vapour diffusion EN 15026	Weighted sound reduction index R _w EN ISO 717-1 [dB]
Layer No.	2	3	4	5	6	7	8	9	10.1			
Flat roof + vegetation 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	*	-

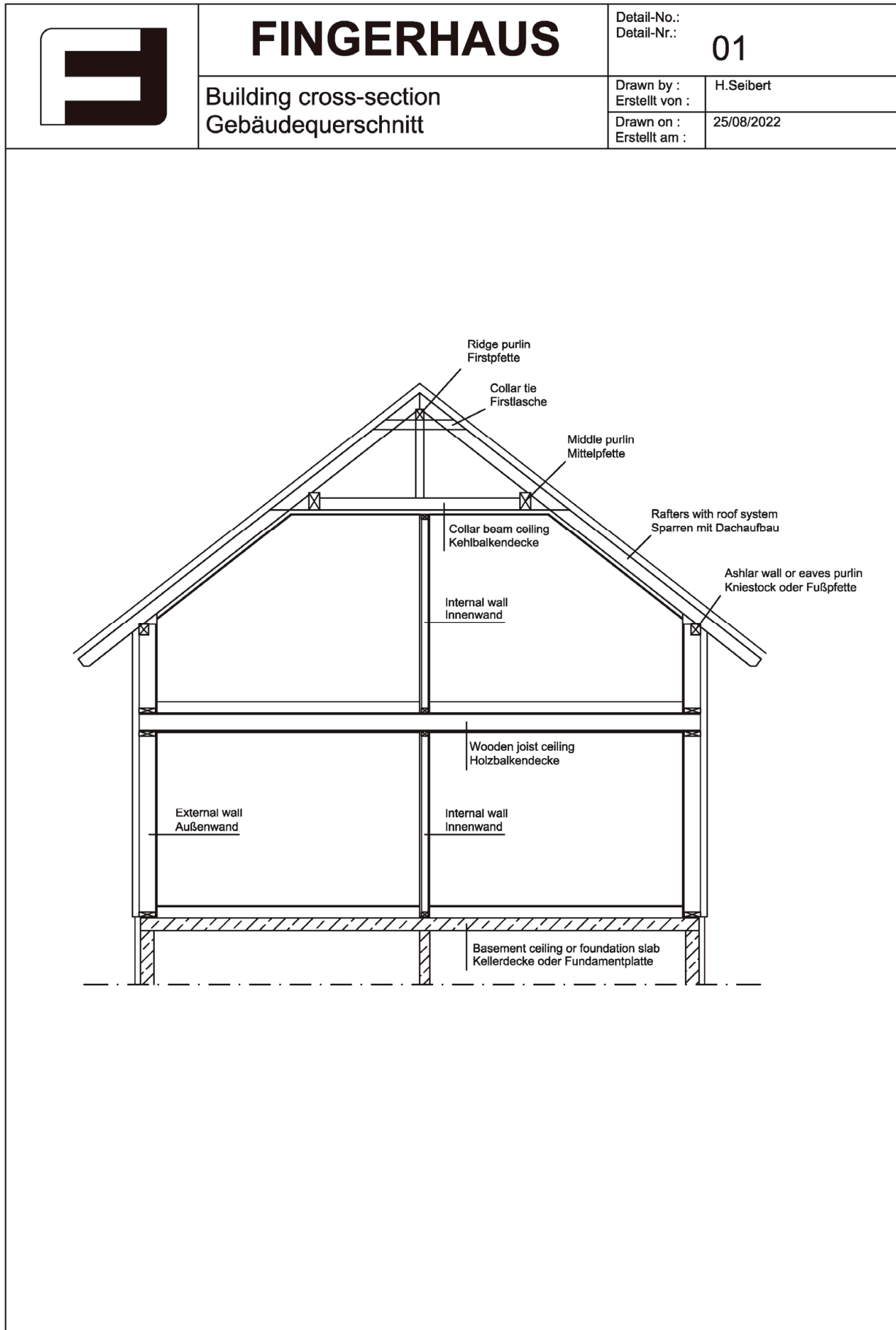
- * The calculation has been done under the following conditions:
- Outside climate: hourly climate data of the hygrothermal reference year for Holzkirchen
 - Inside climate: derivation of the outside climate according to EN 15026 for the living room with ordinary allocation
 - Possible shadowing has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

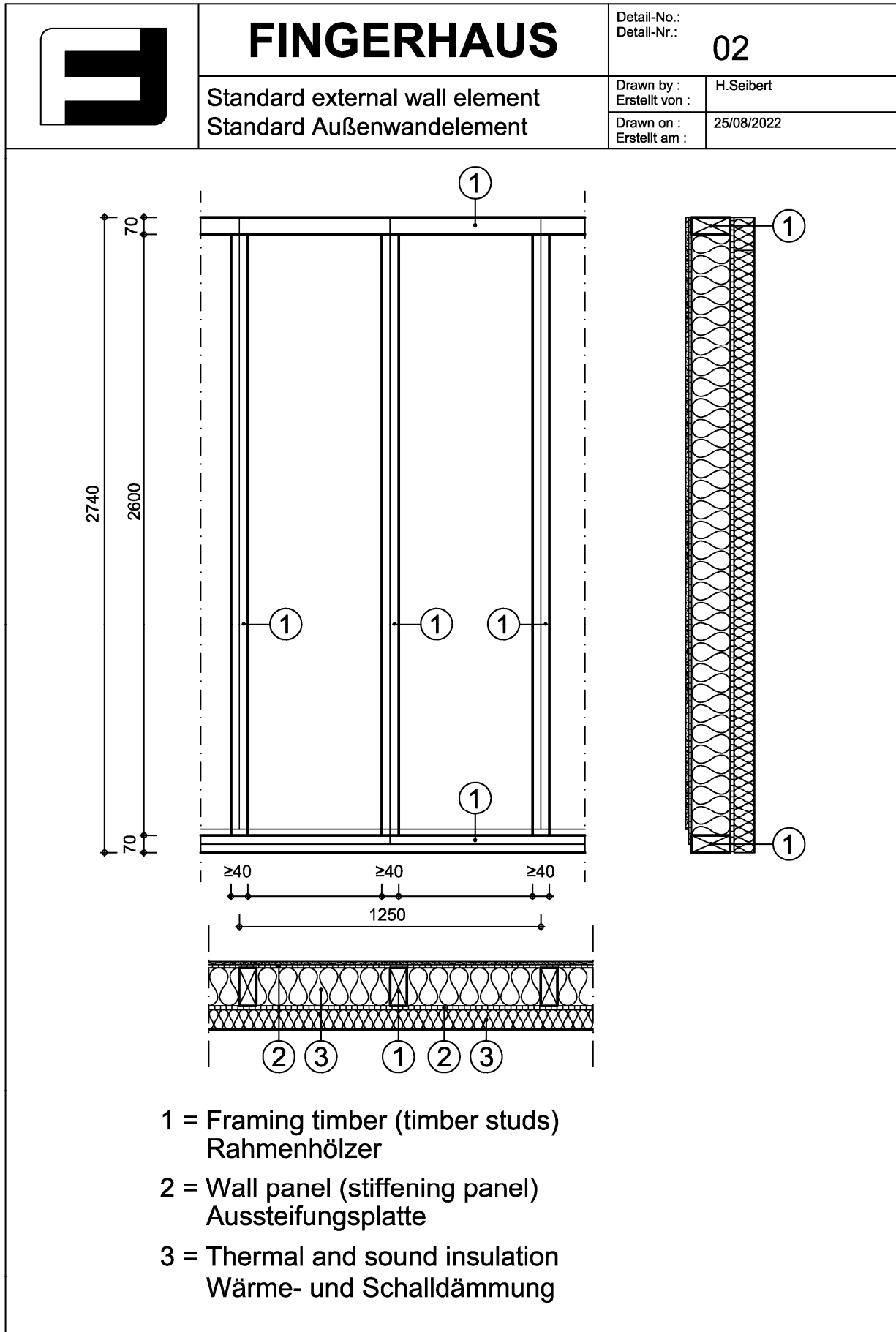
bb) Windows and Doors

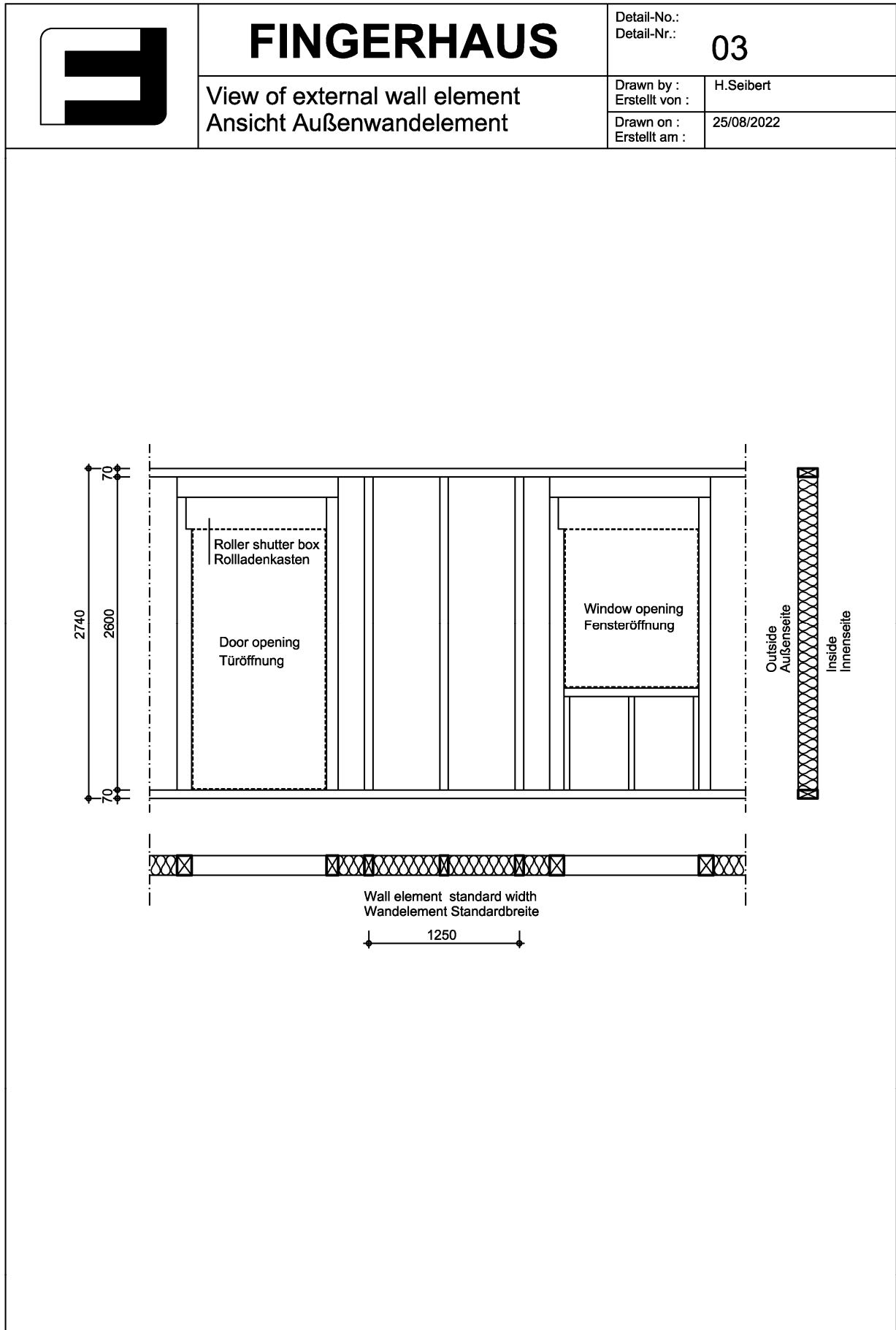
Windows and external doors have been tested according to the provisions stated in EN 14351-1. The properties are given in the following table according to that standard.

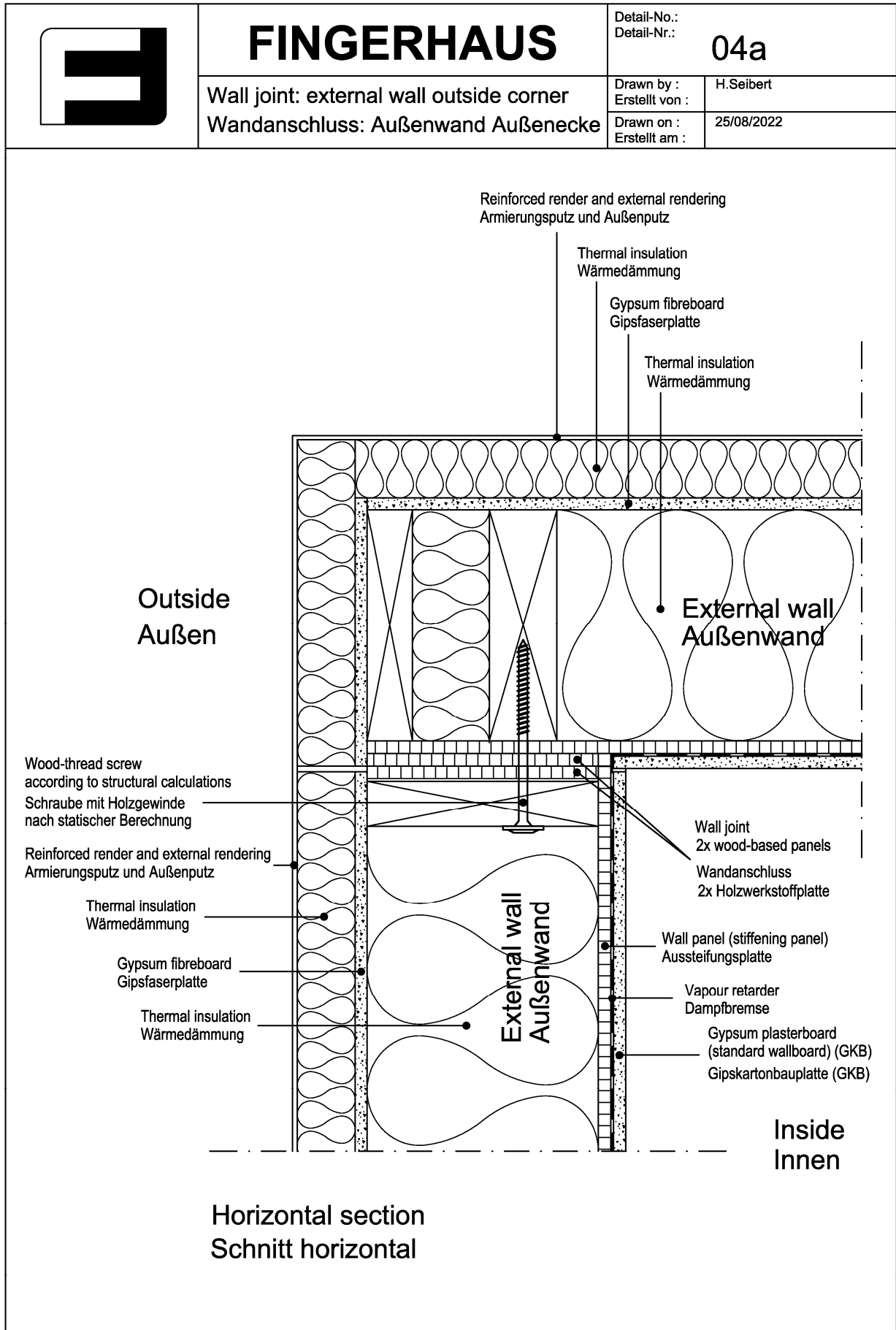
Characteristics						
Type of Windows/Doors	F1/T1 (1.1)	F2/T2 (1.2)	F3/T3 (3.1)	(3.2)	T5 (2.1)	T6 (2.2)
	Windows / doors with fixed mullions / crossbars	Windows / doors with front plate	Entrance doors	Lifting- sliding doors	PSK-doors	Folding- sash windows and doors
BWR1 Mechanical resistance and stability						
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	E	E	E	E	E	E
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 ⁵⁹	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 $R_w (C; C_{tr})$ (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

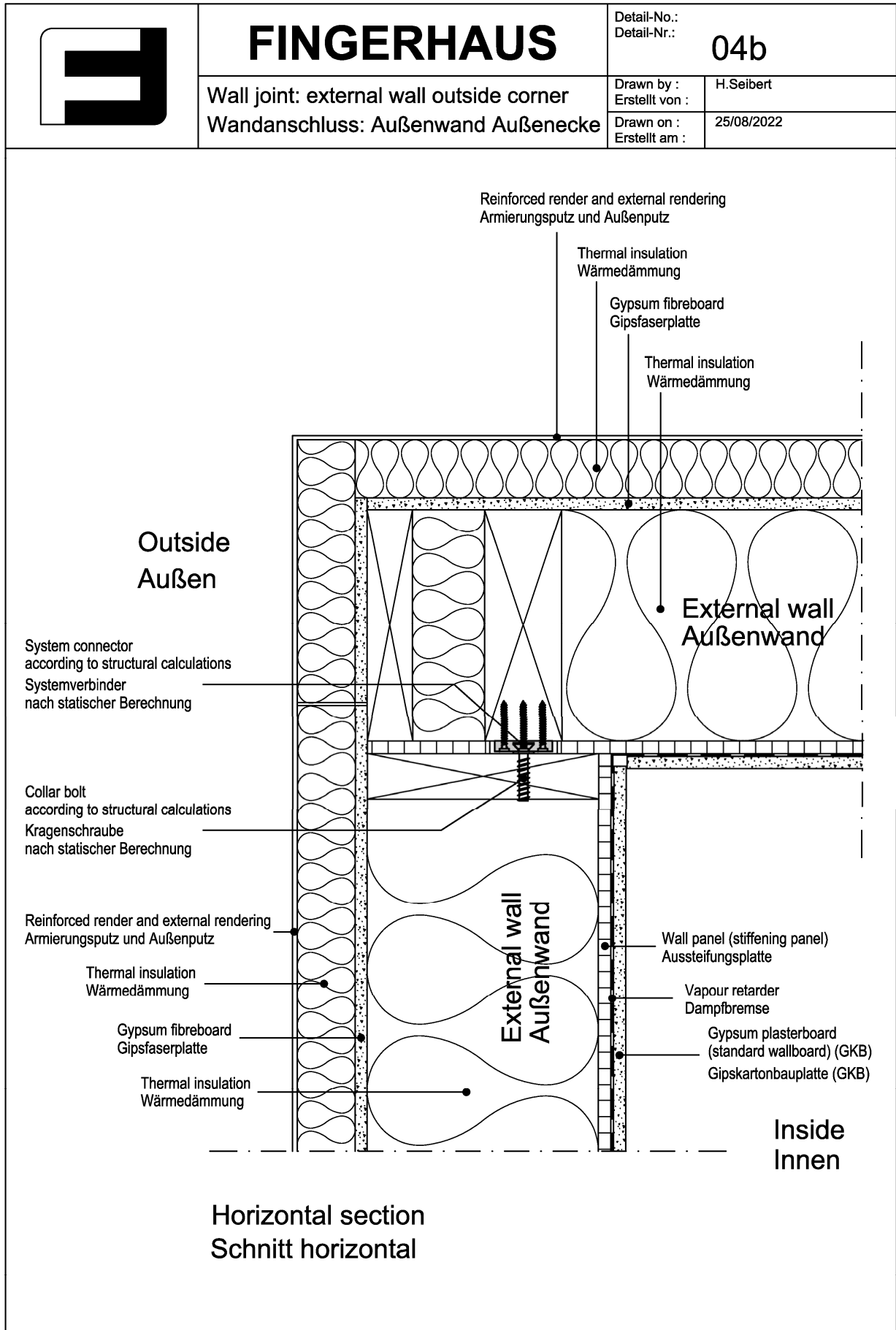
⁵⁹ Finnish regulations contain safety provisions for windows. 6 mm glass or safety glass shall be used when there is a risk for falling through the window

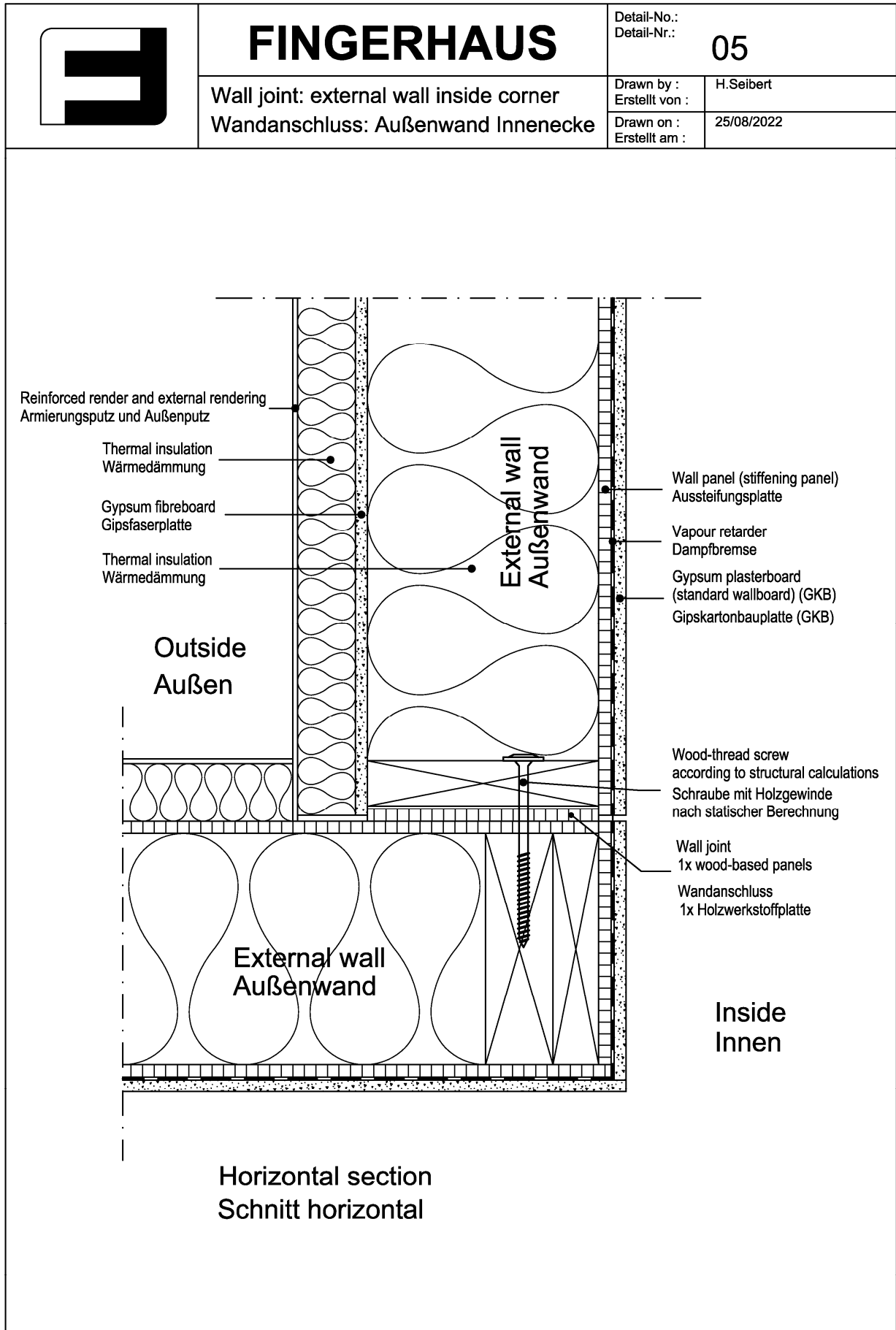


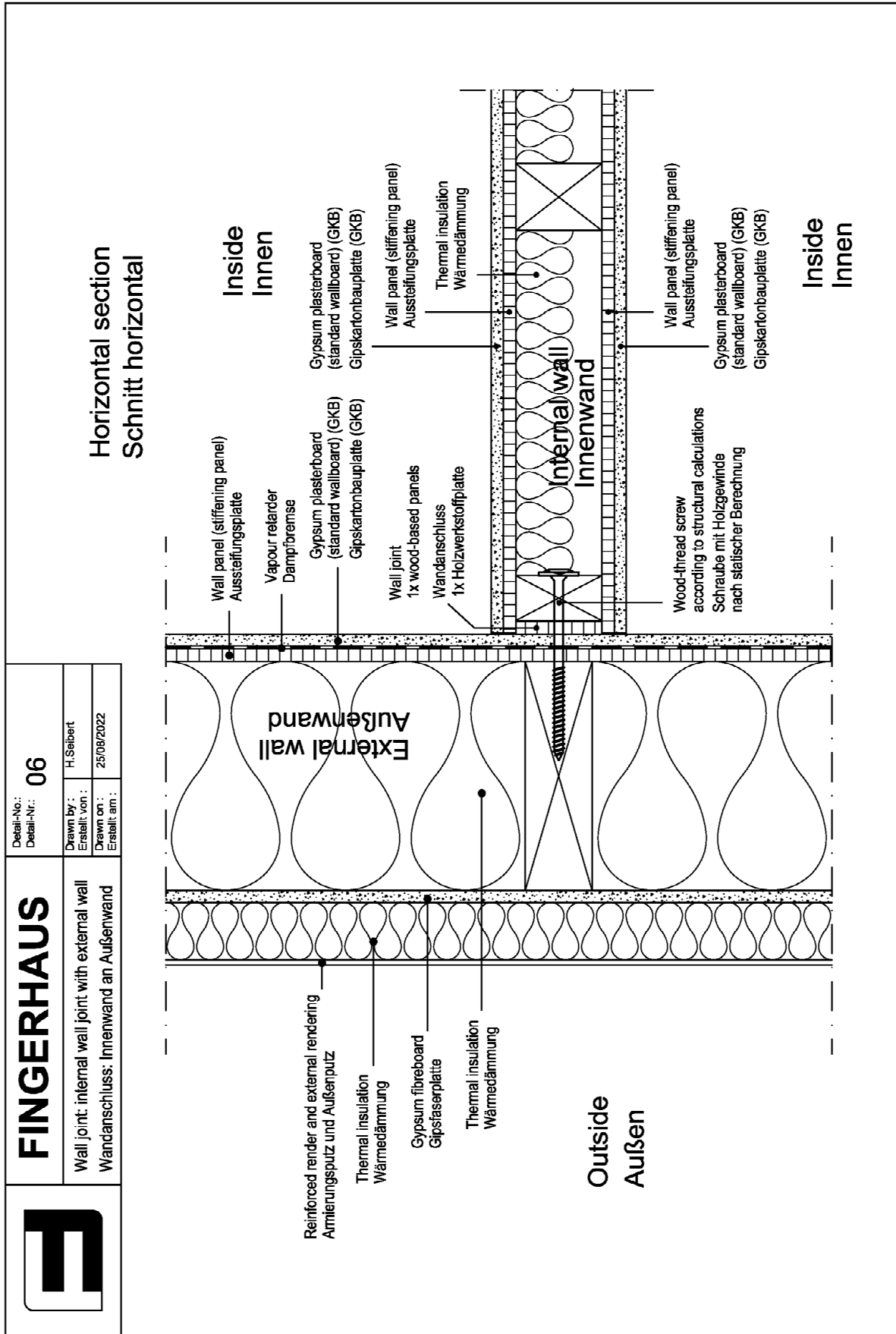


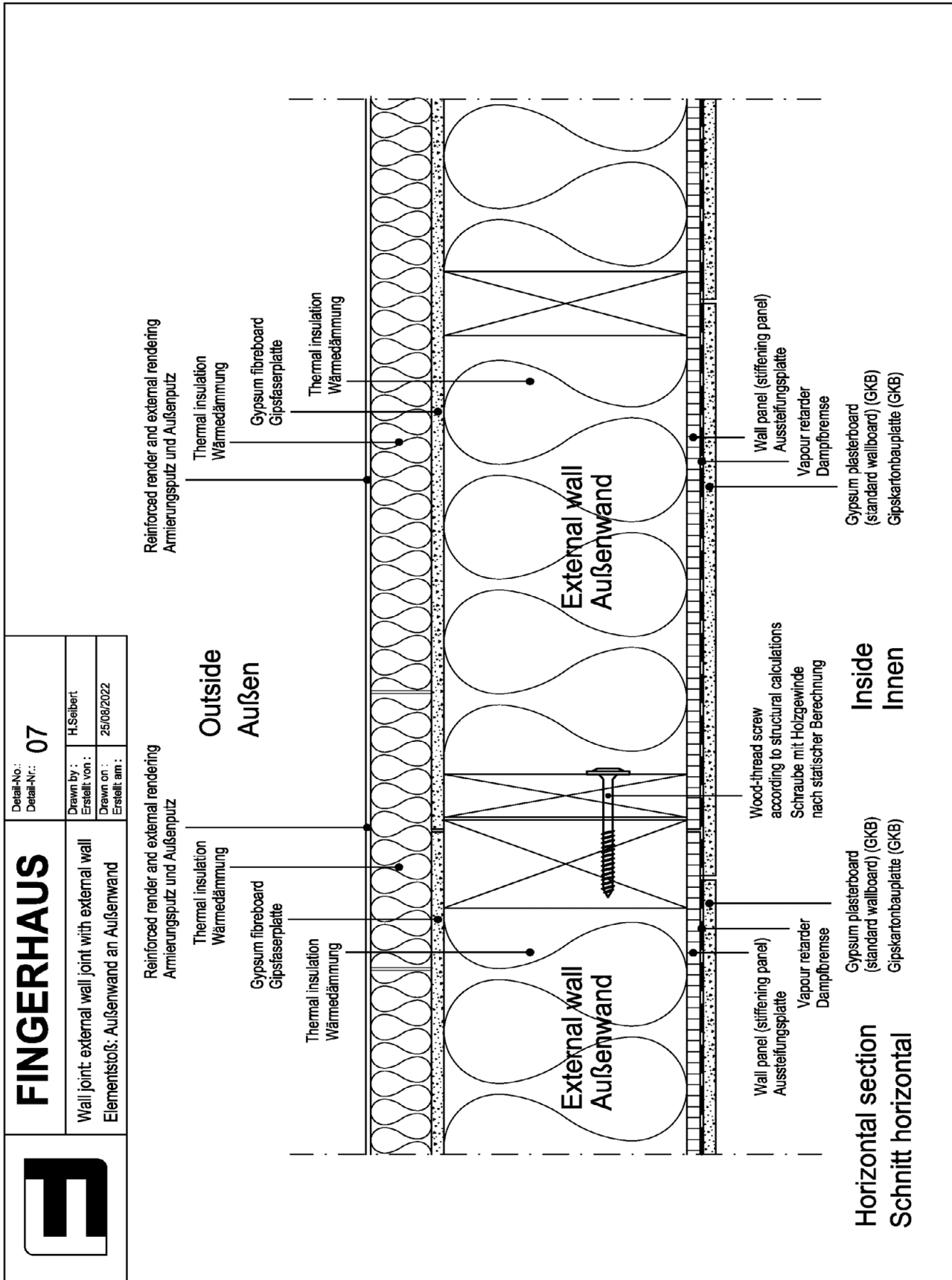


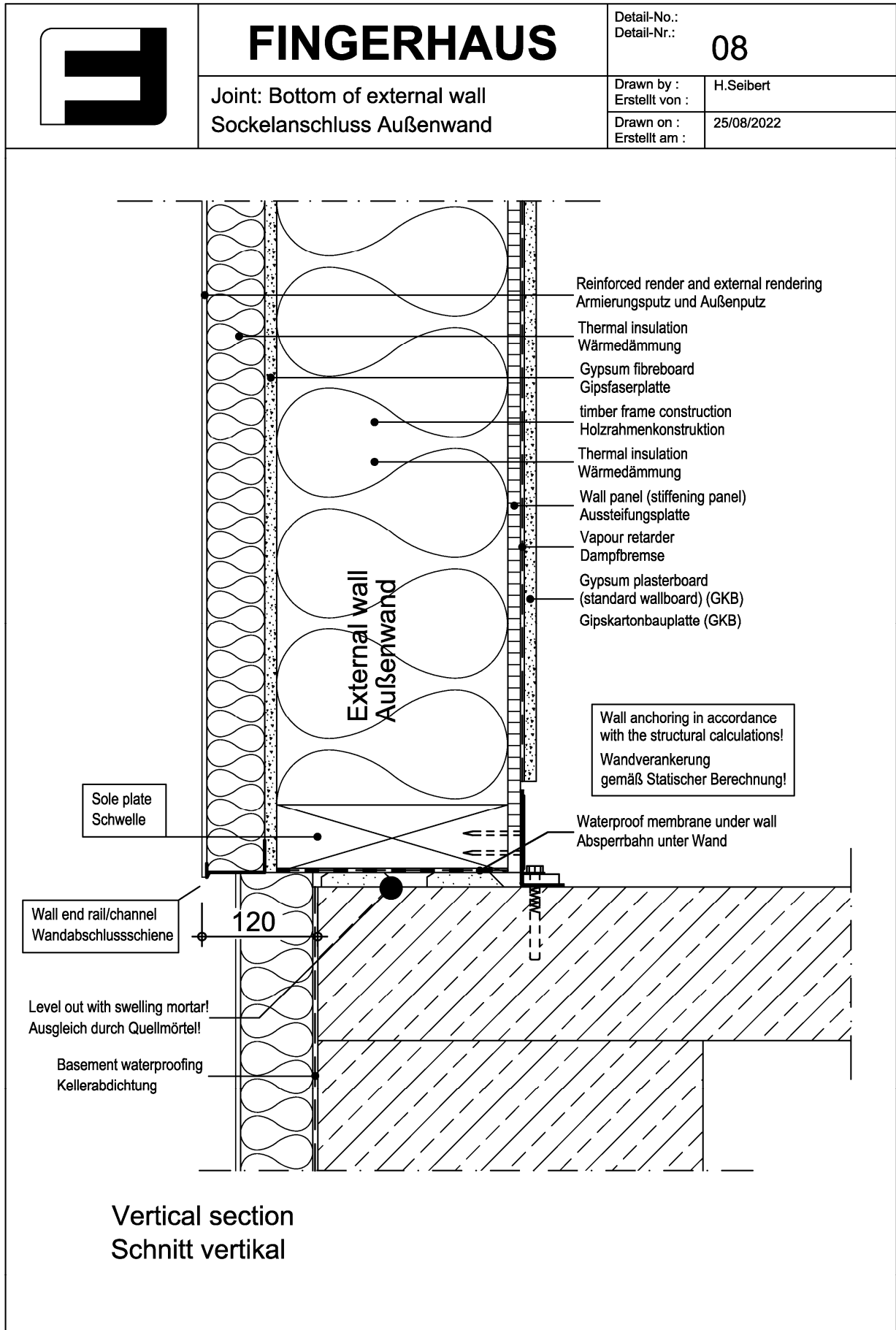


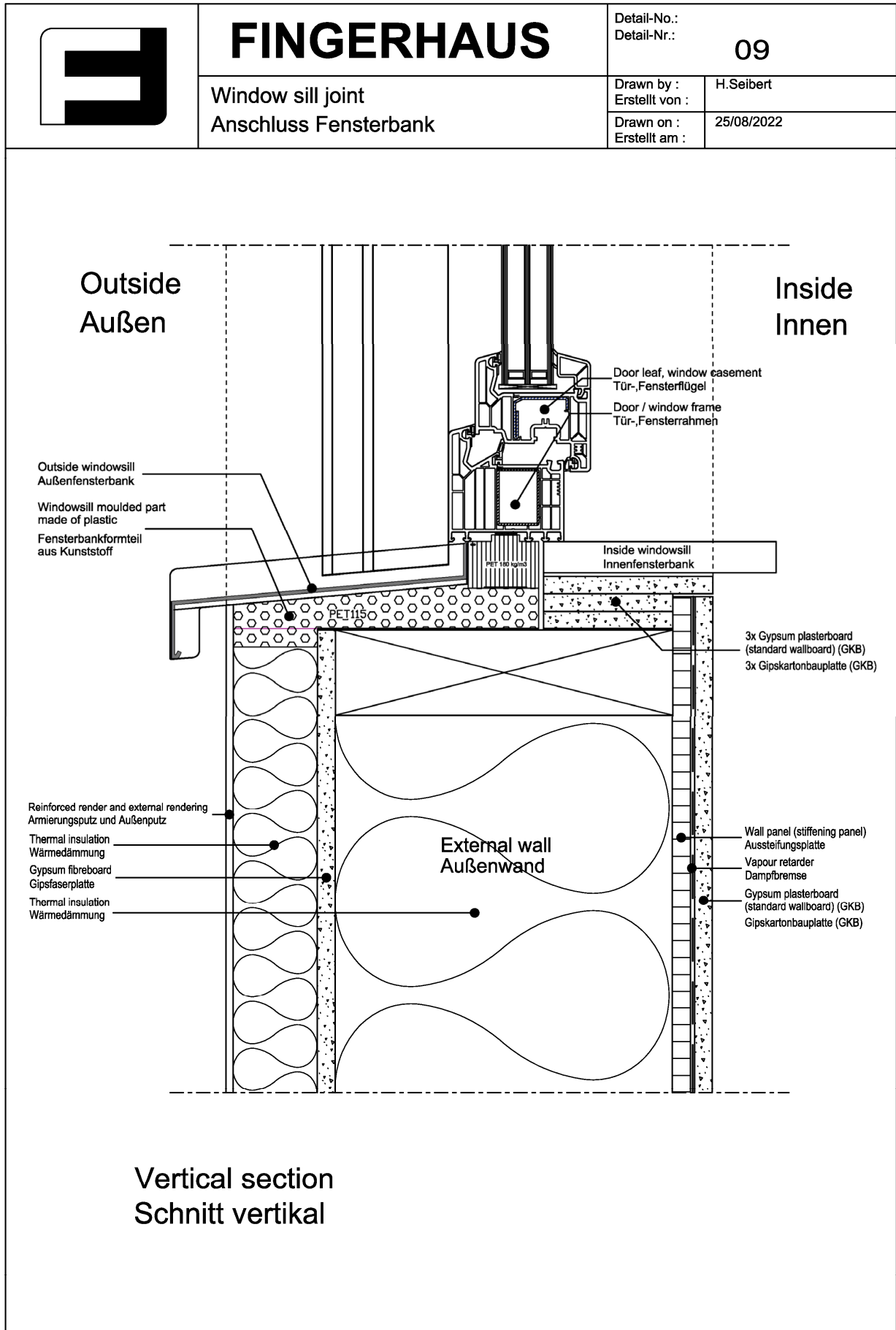


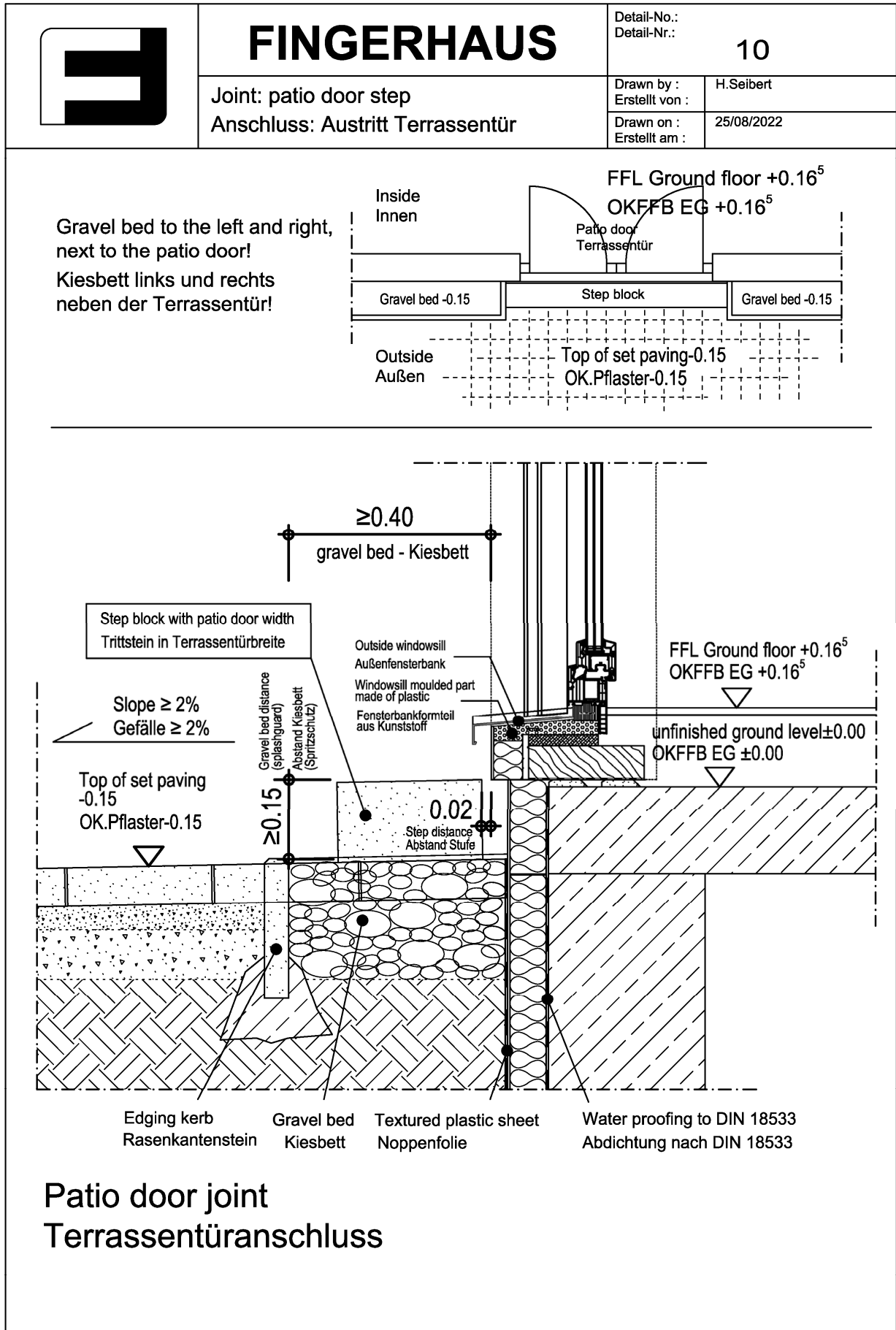


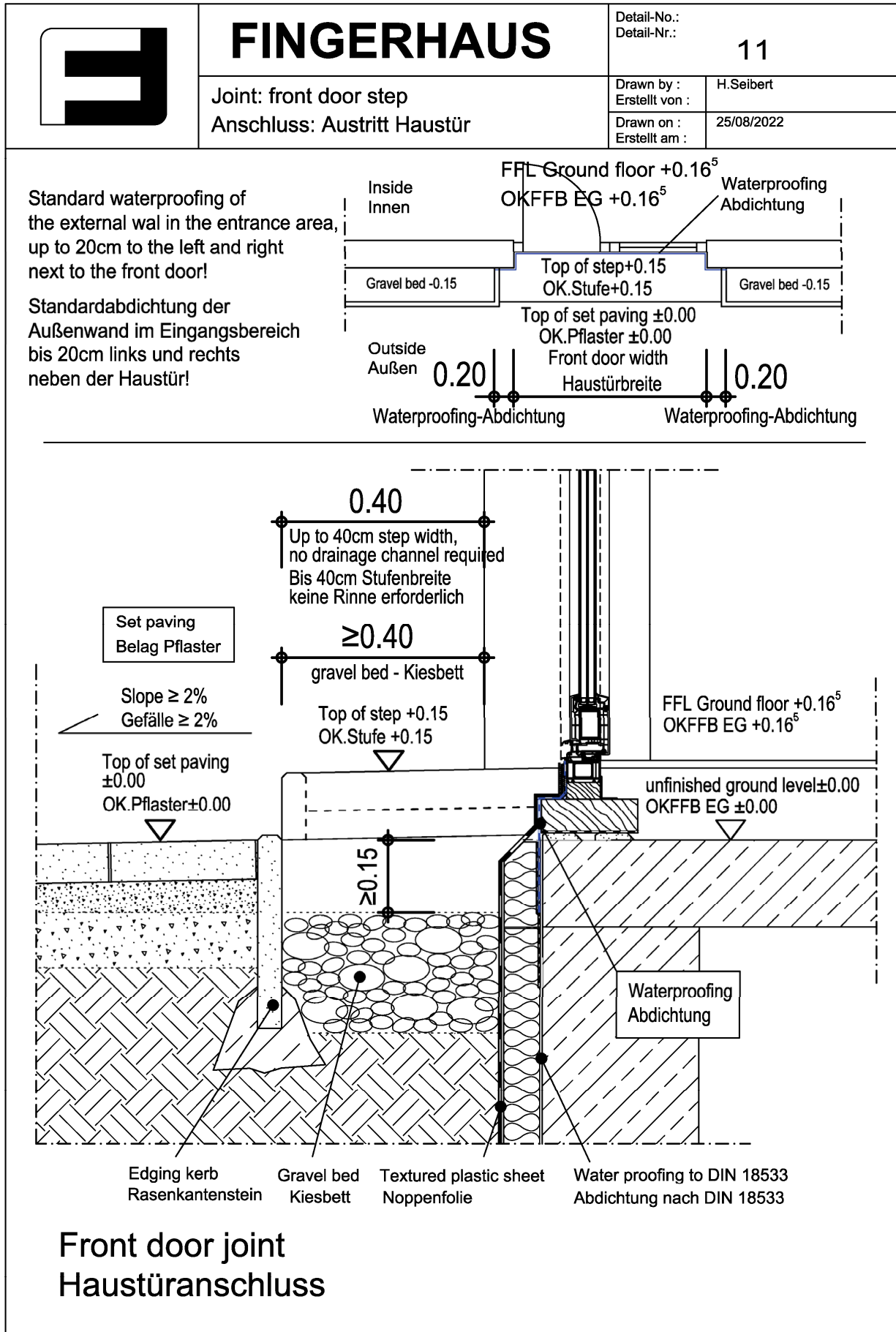


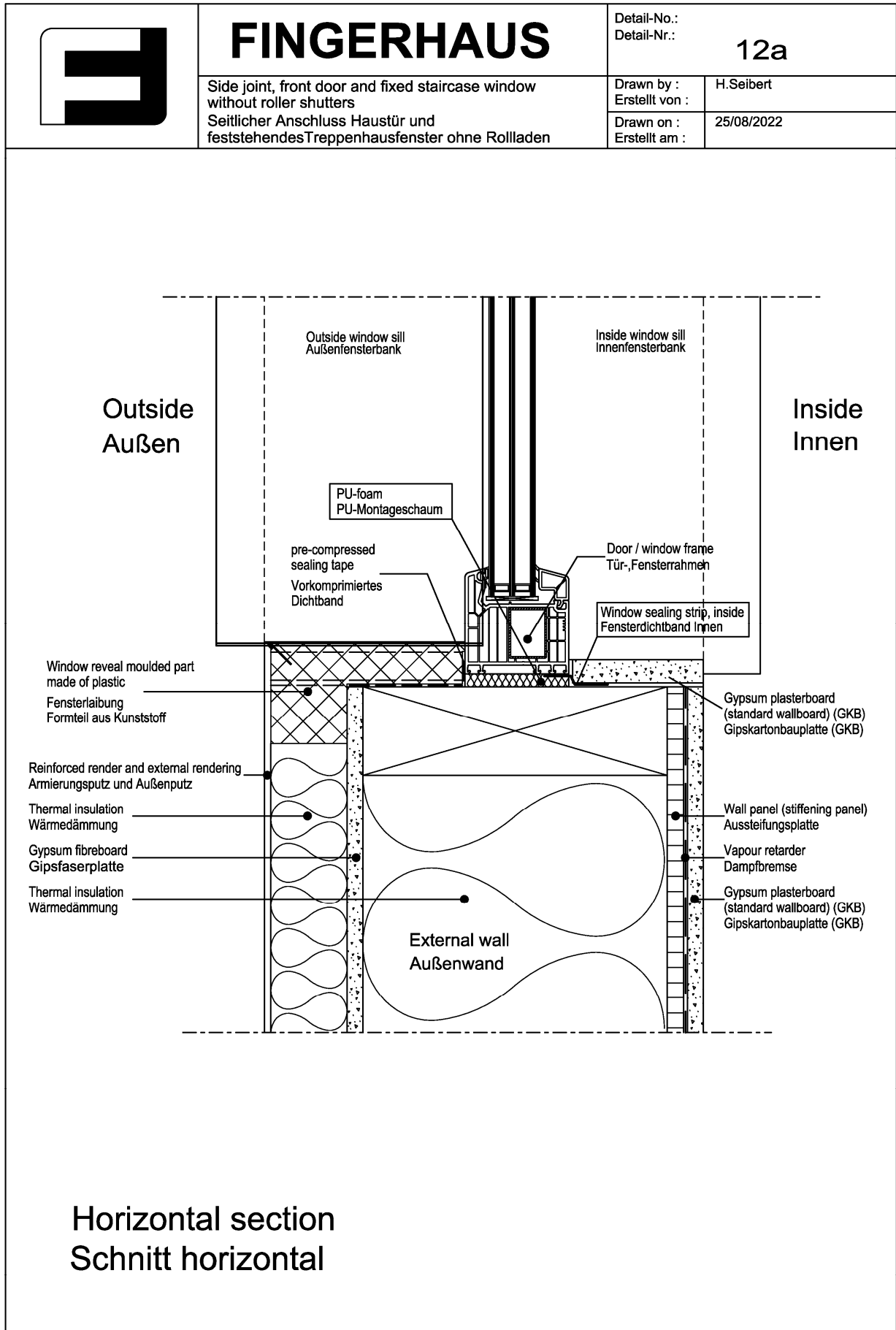


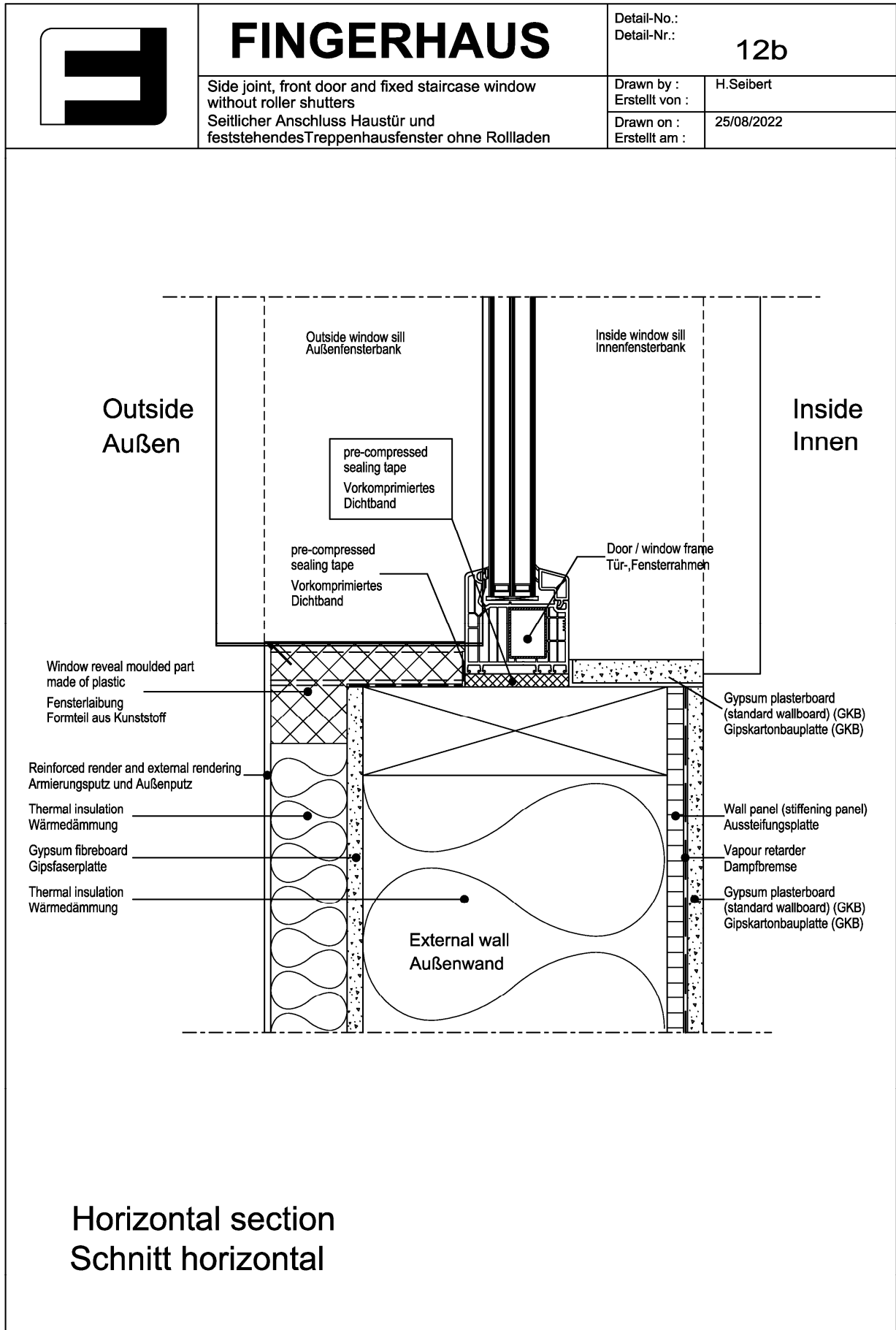


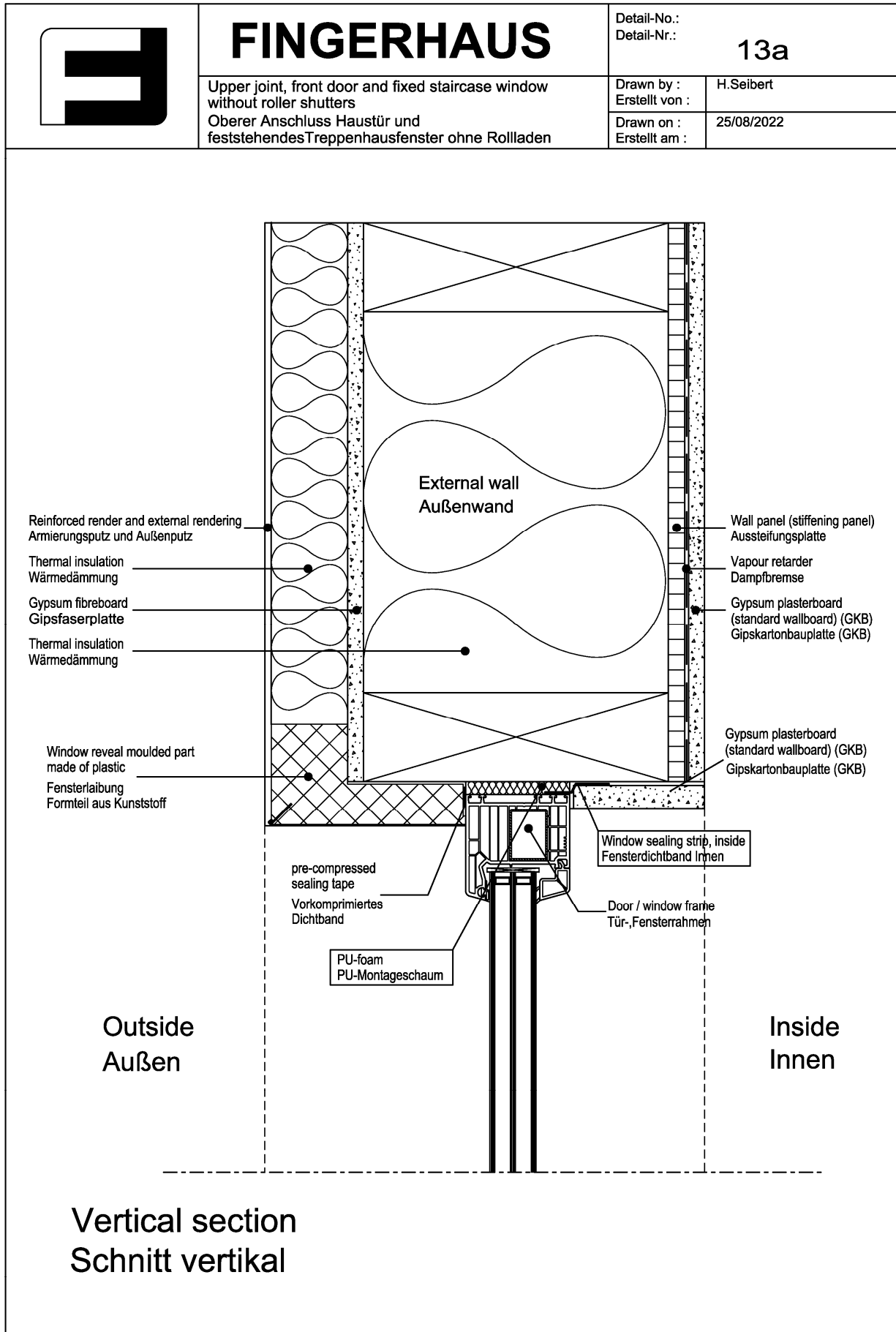


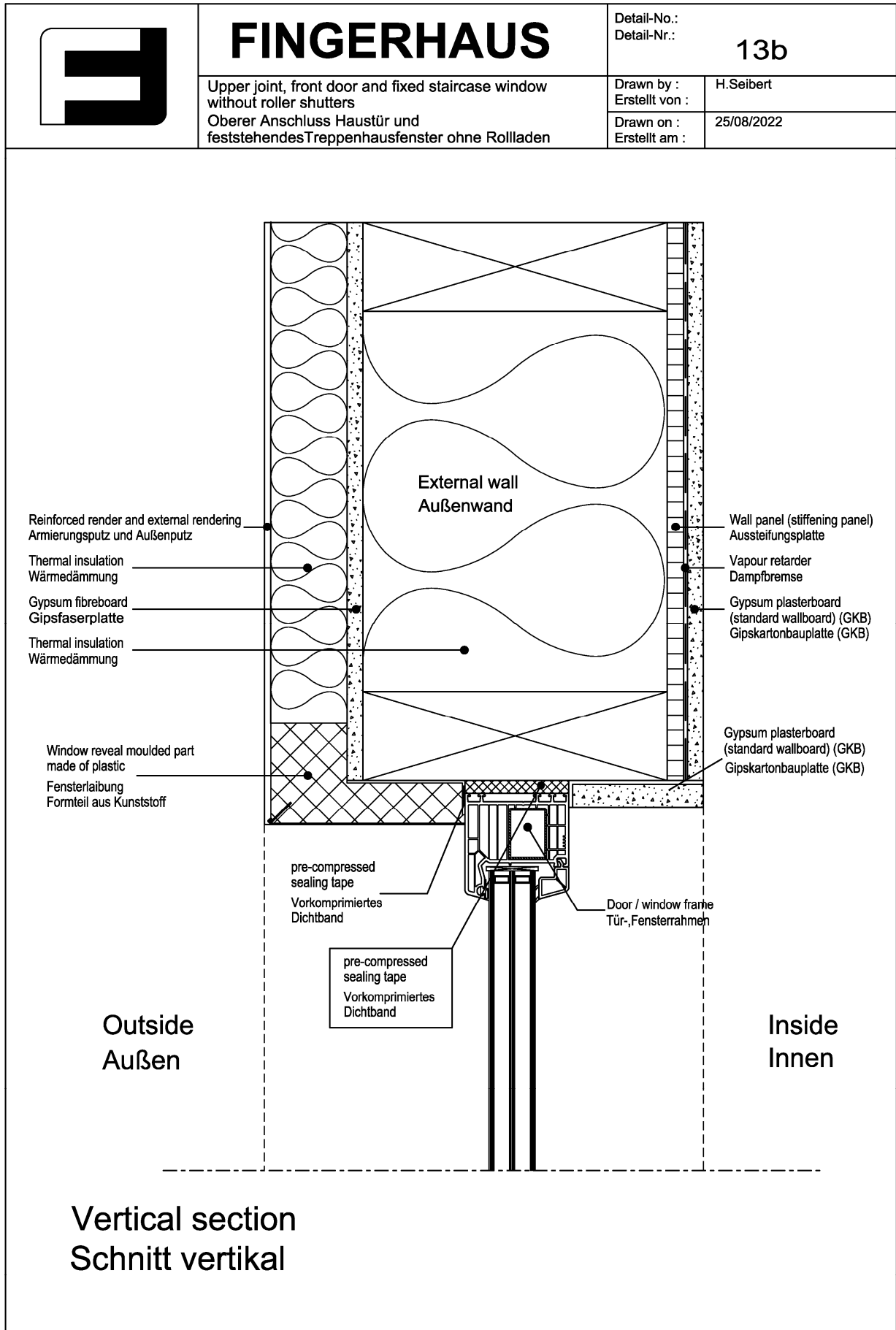


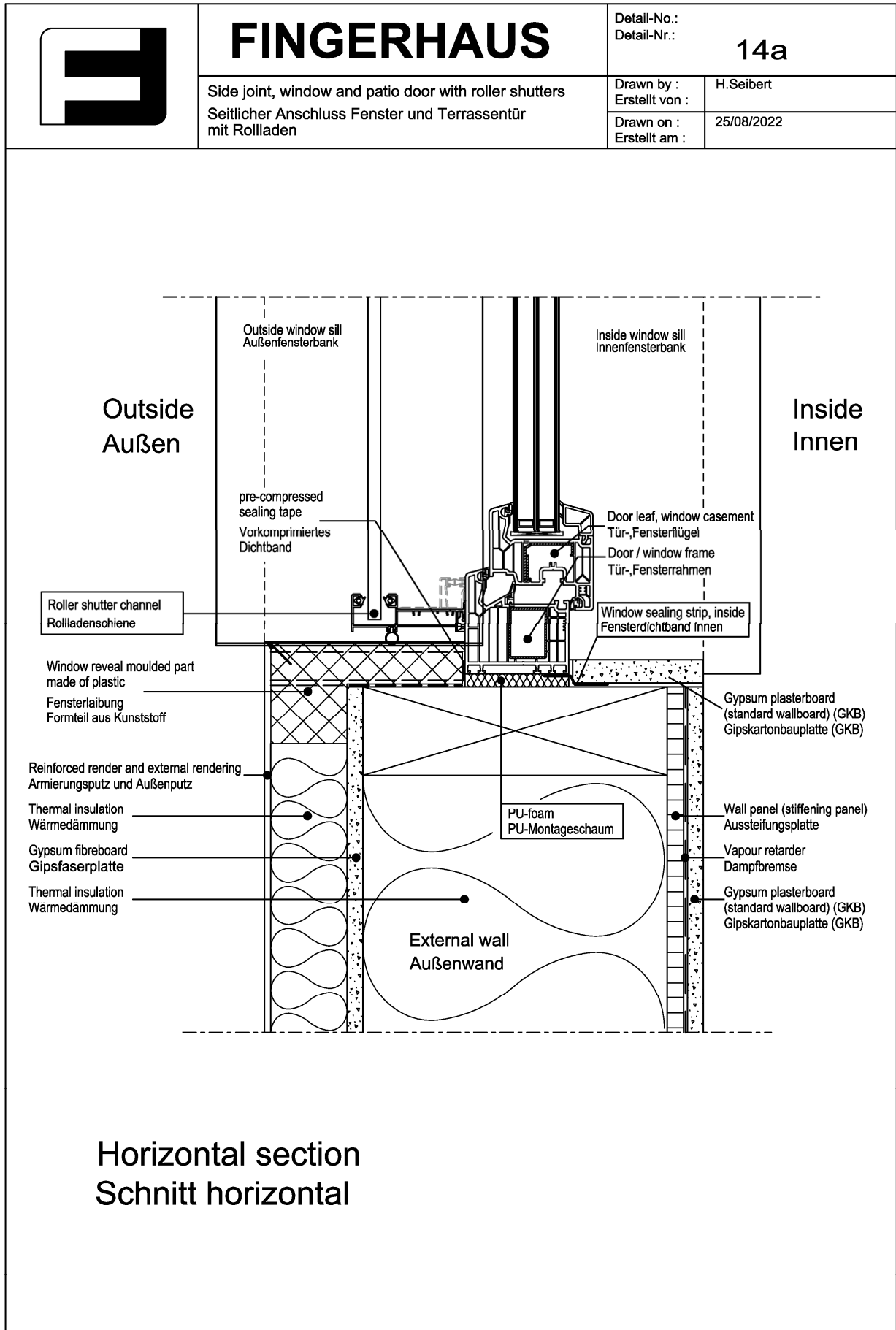


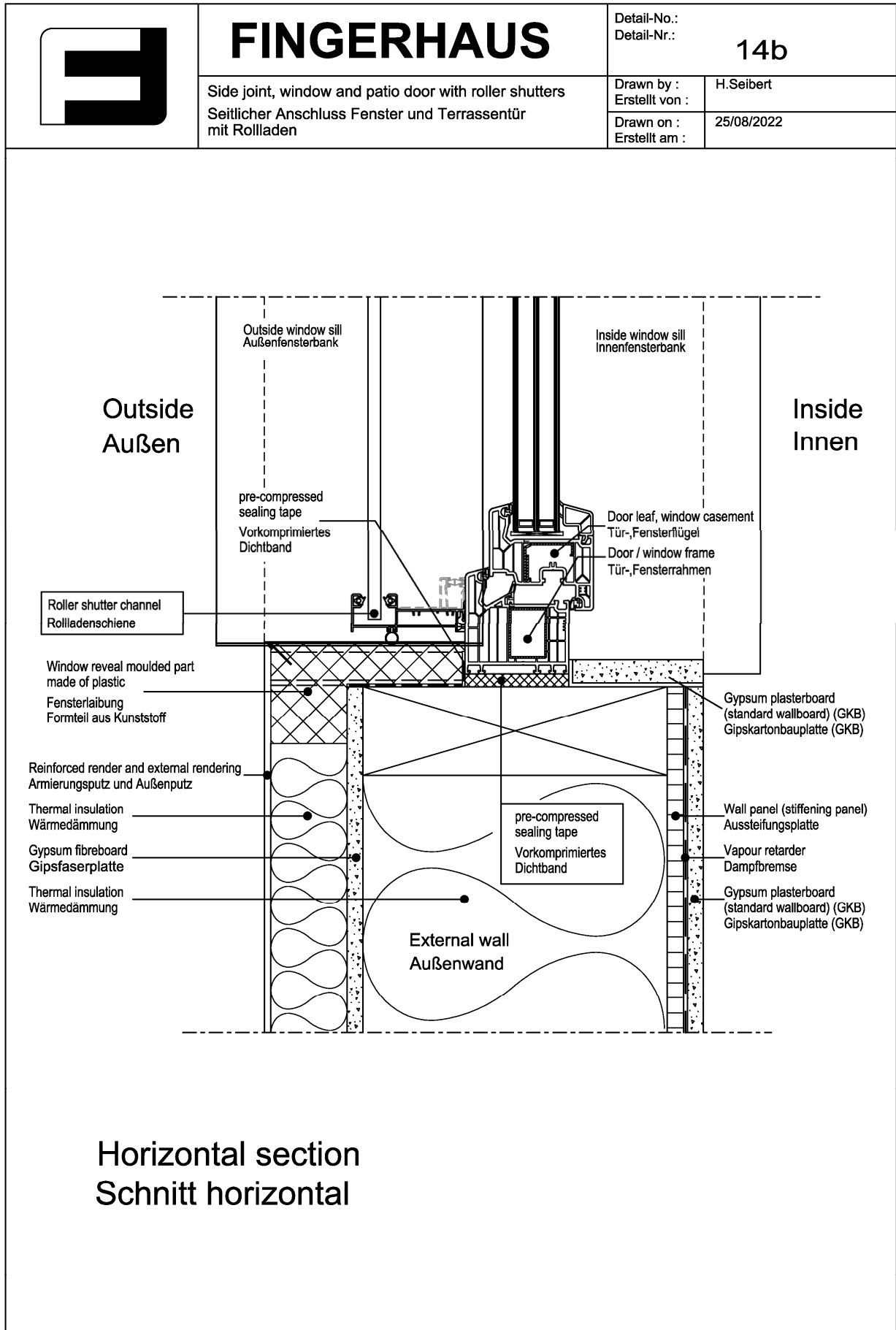


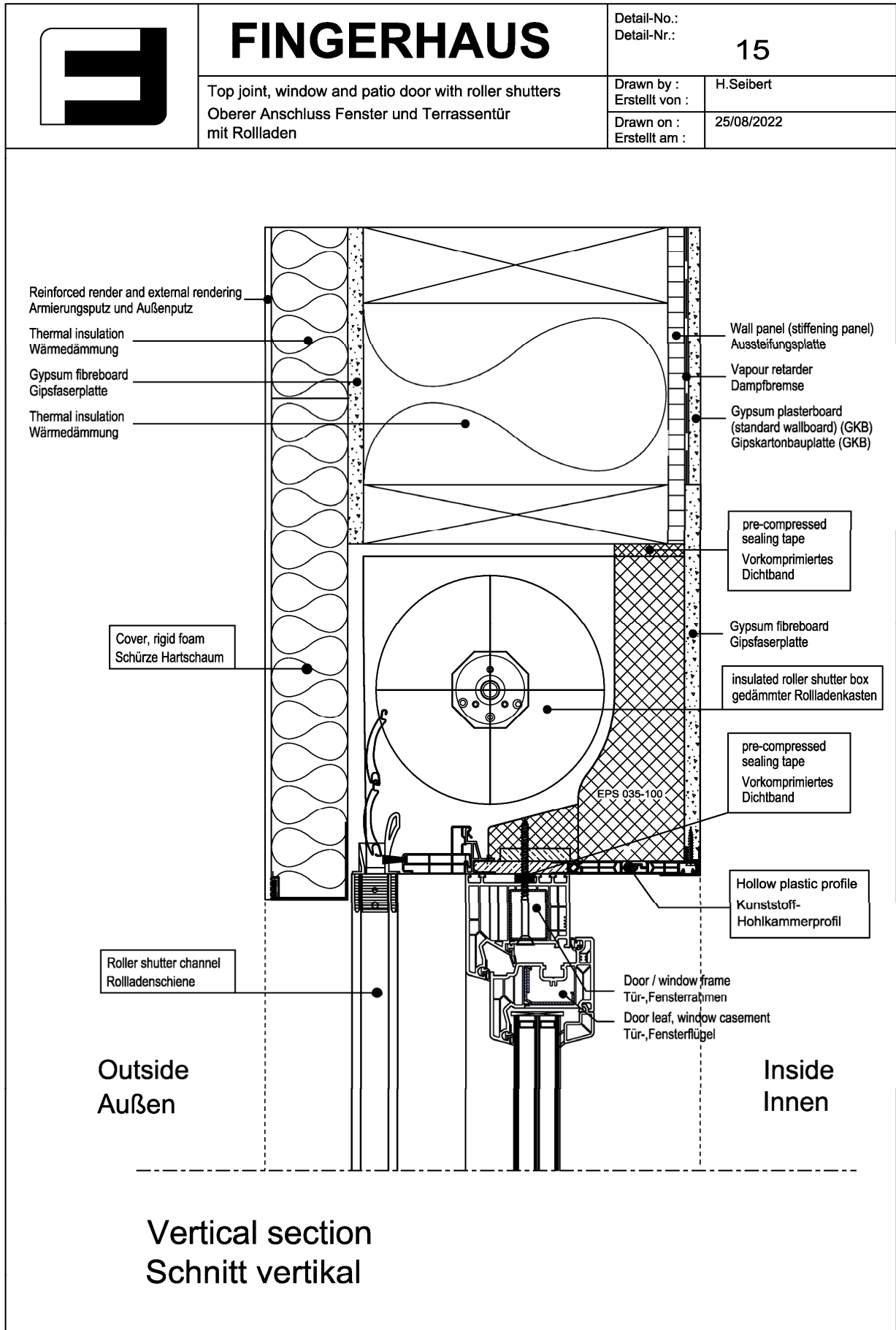


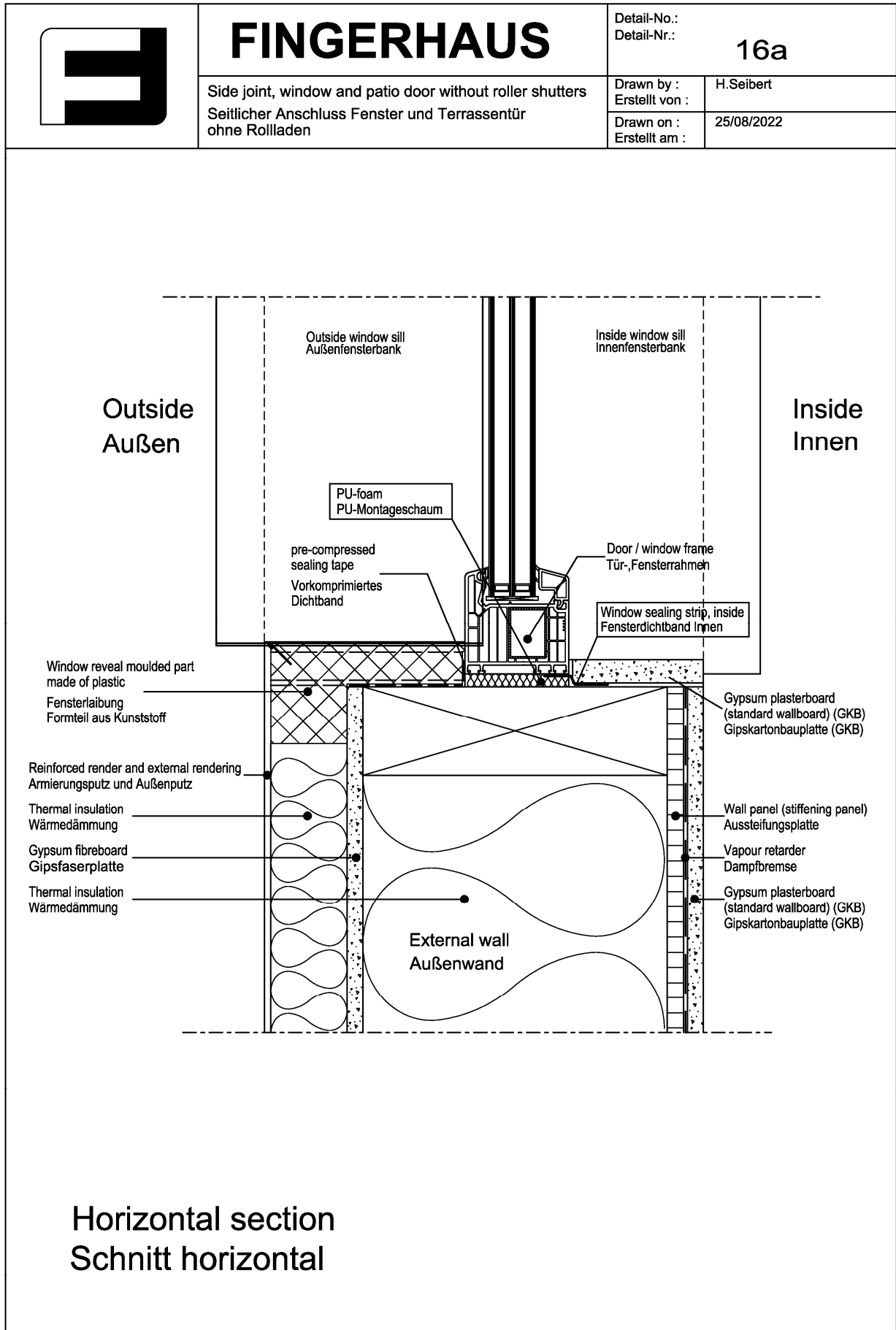


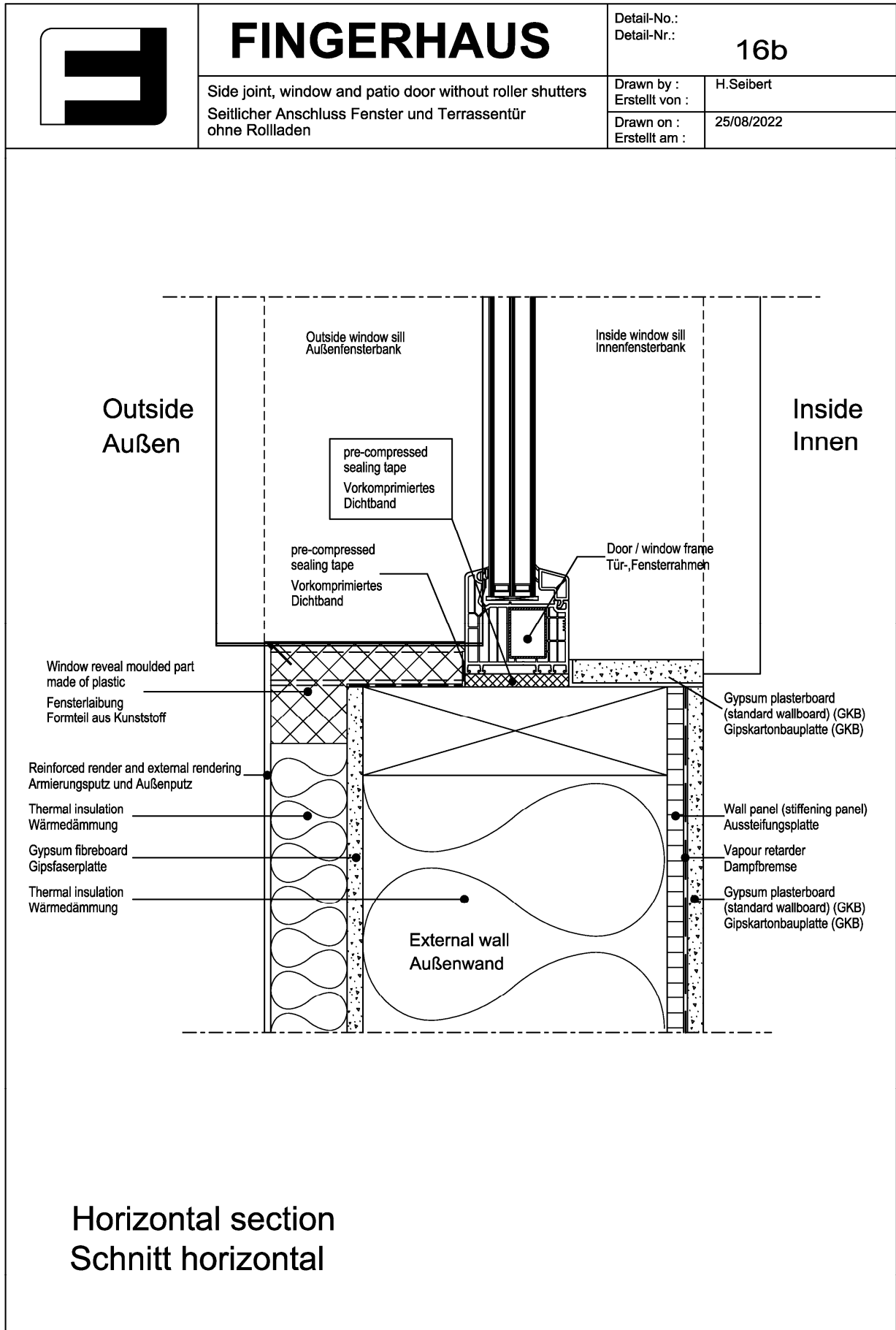


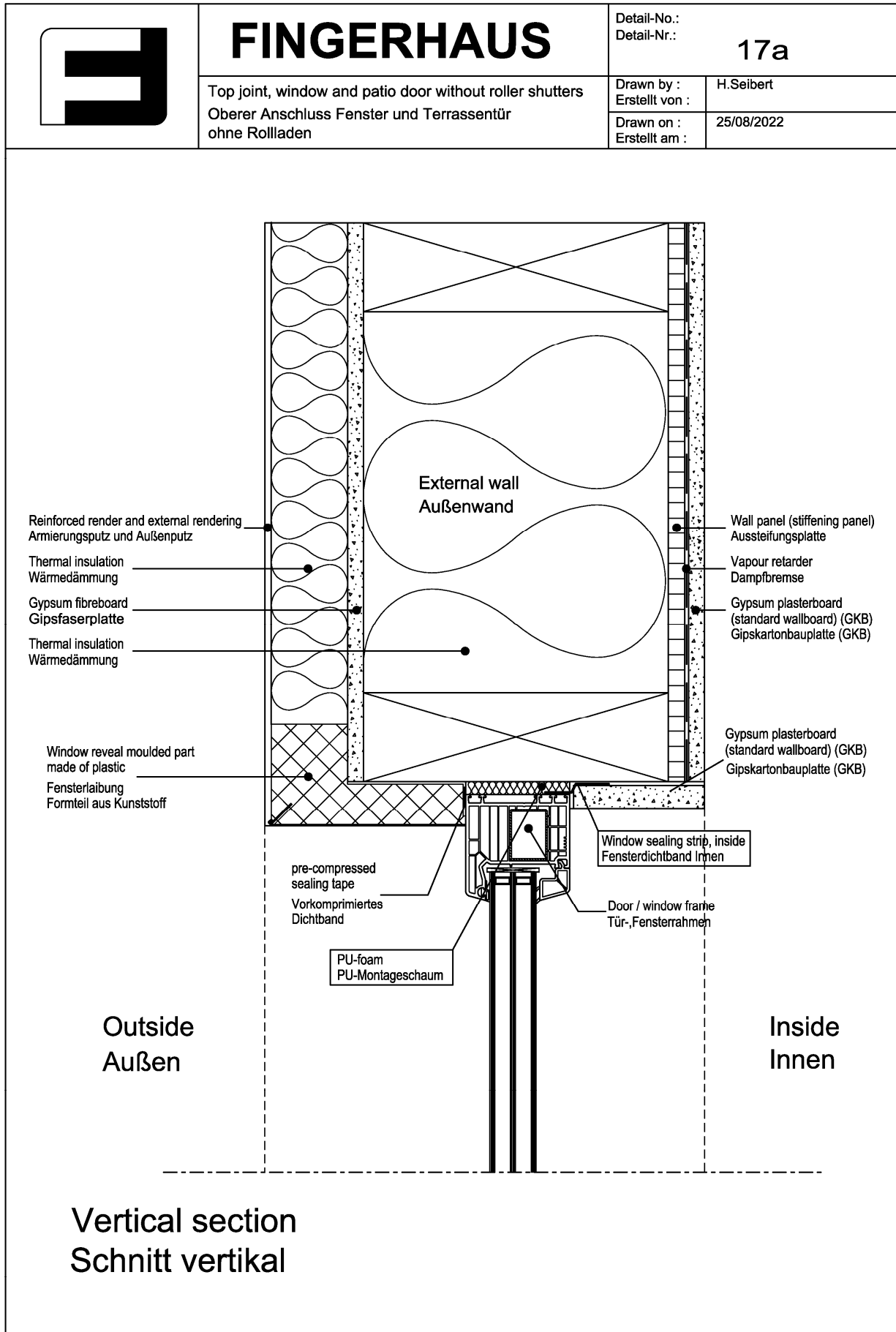


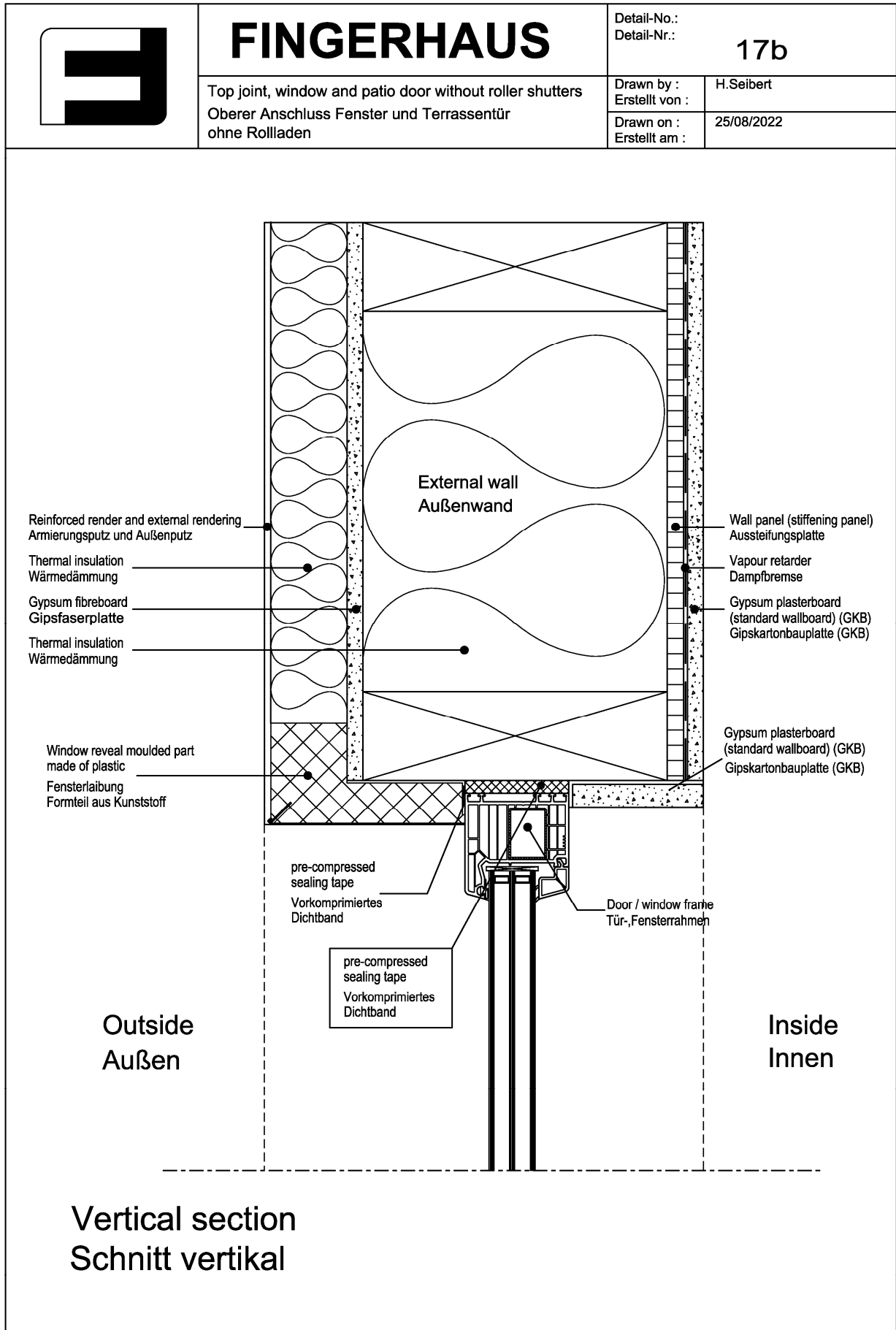


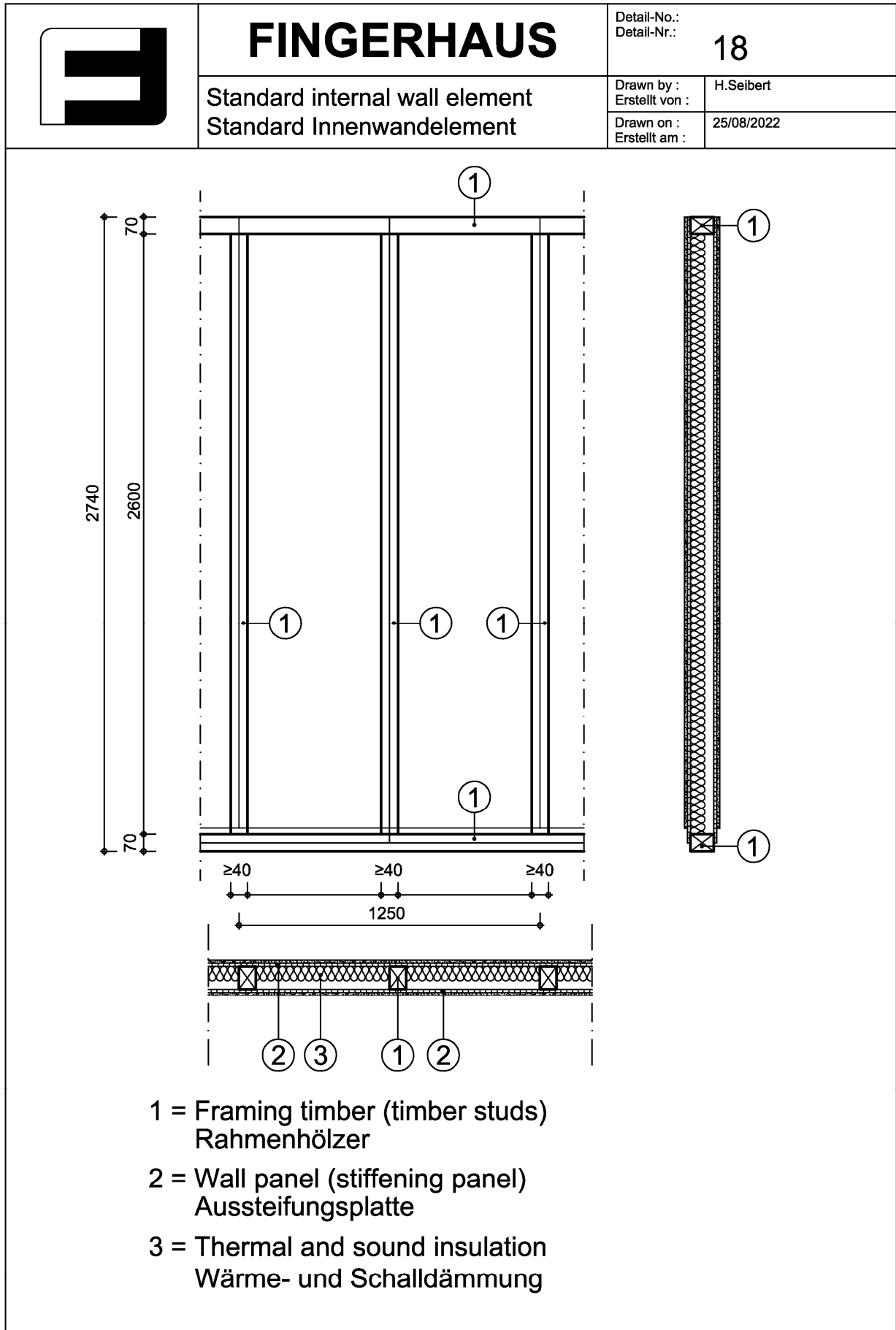


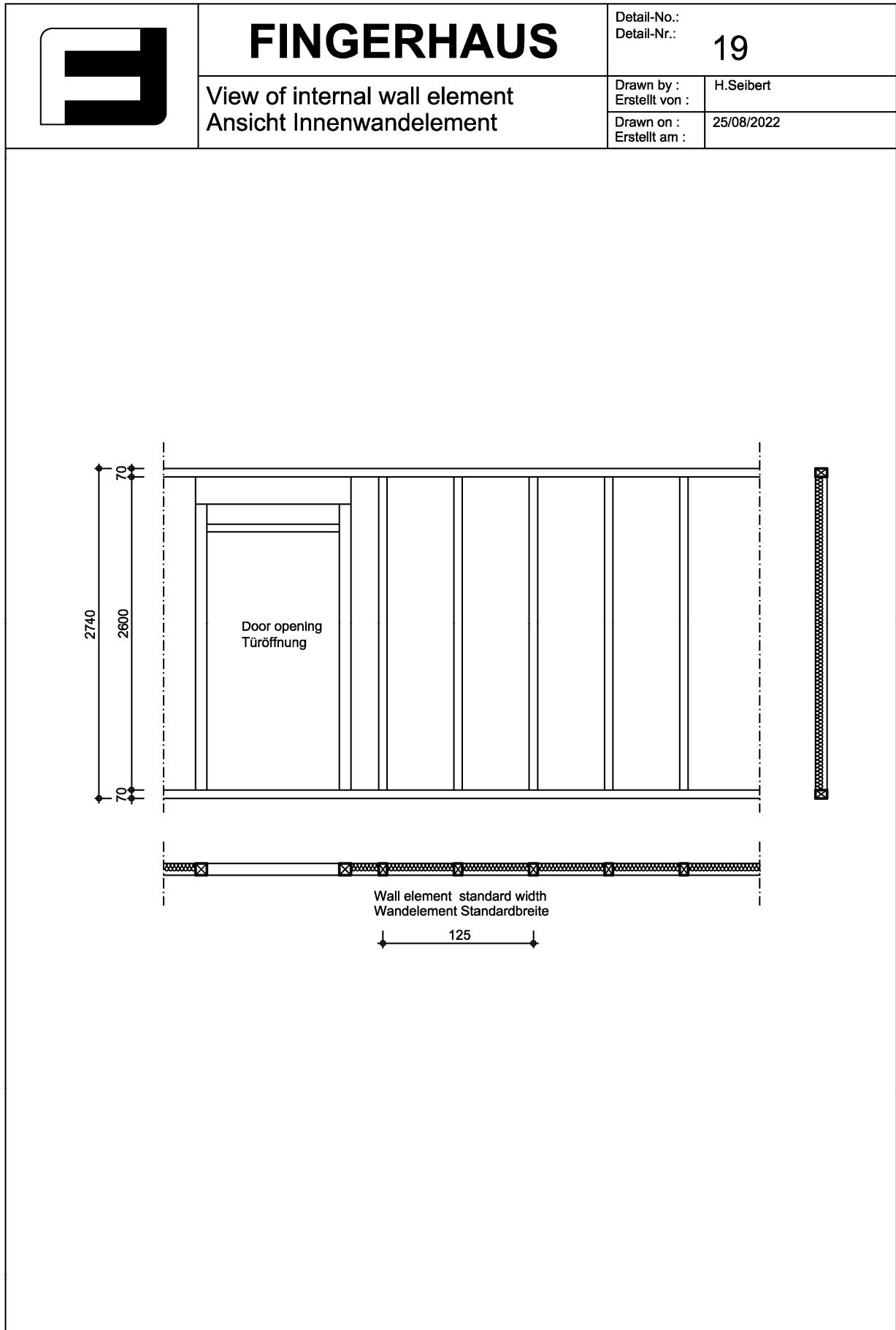




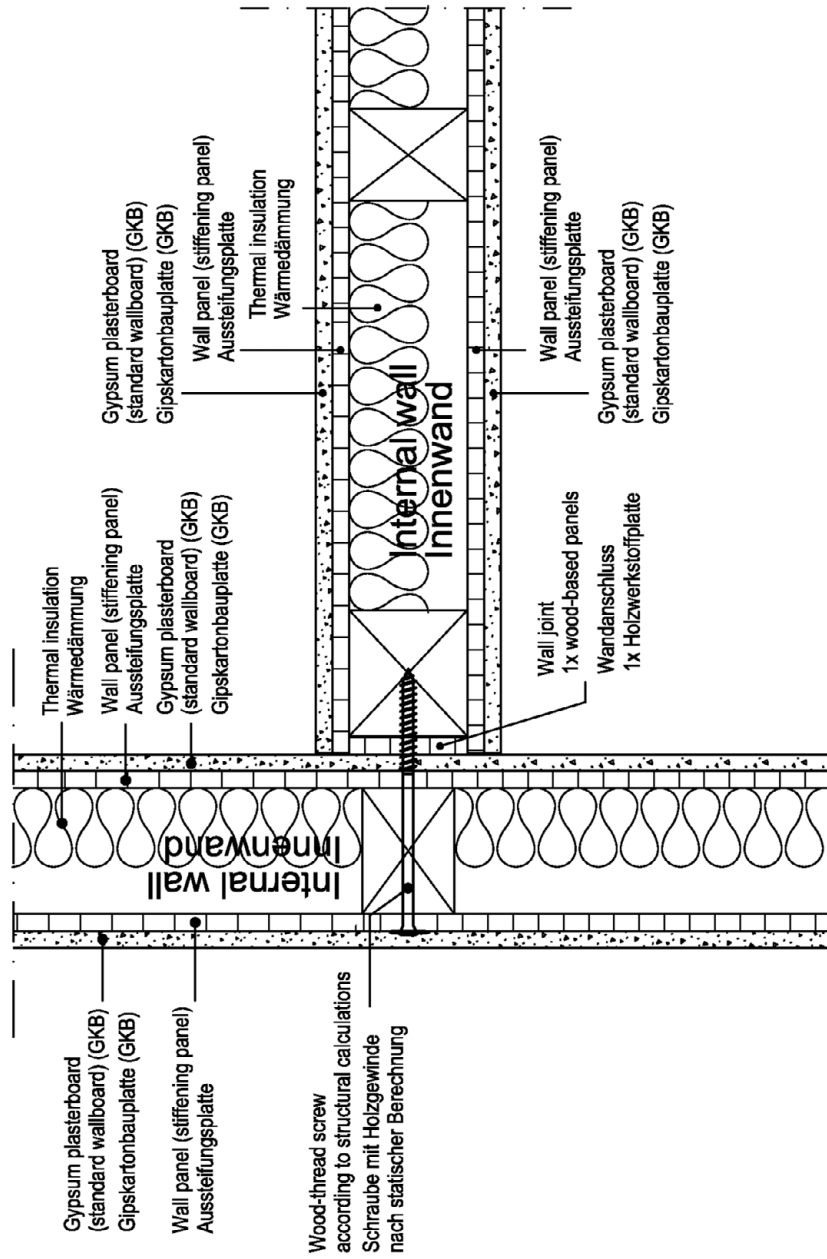








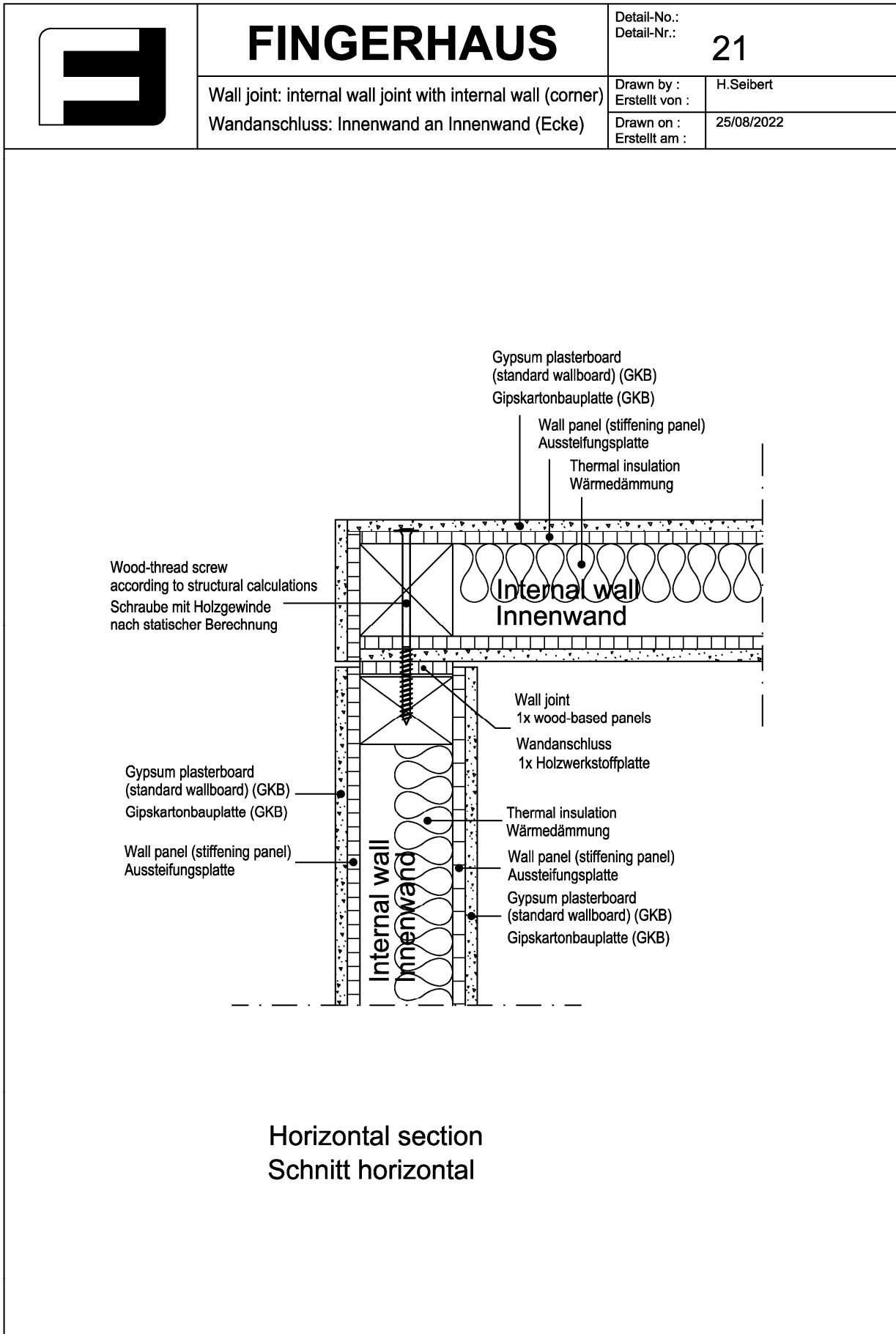
Horizontal section
Schnitt horizontal

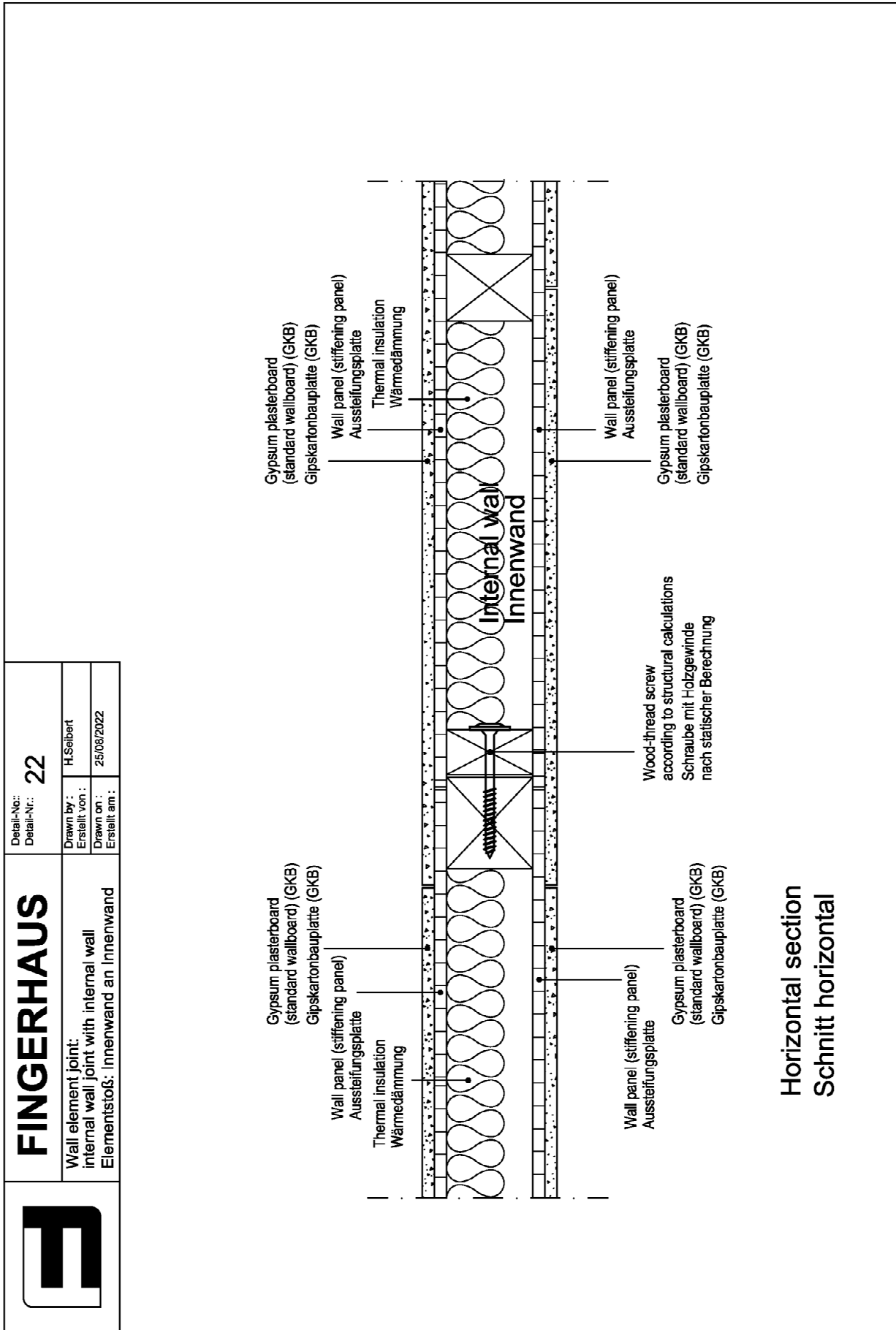


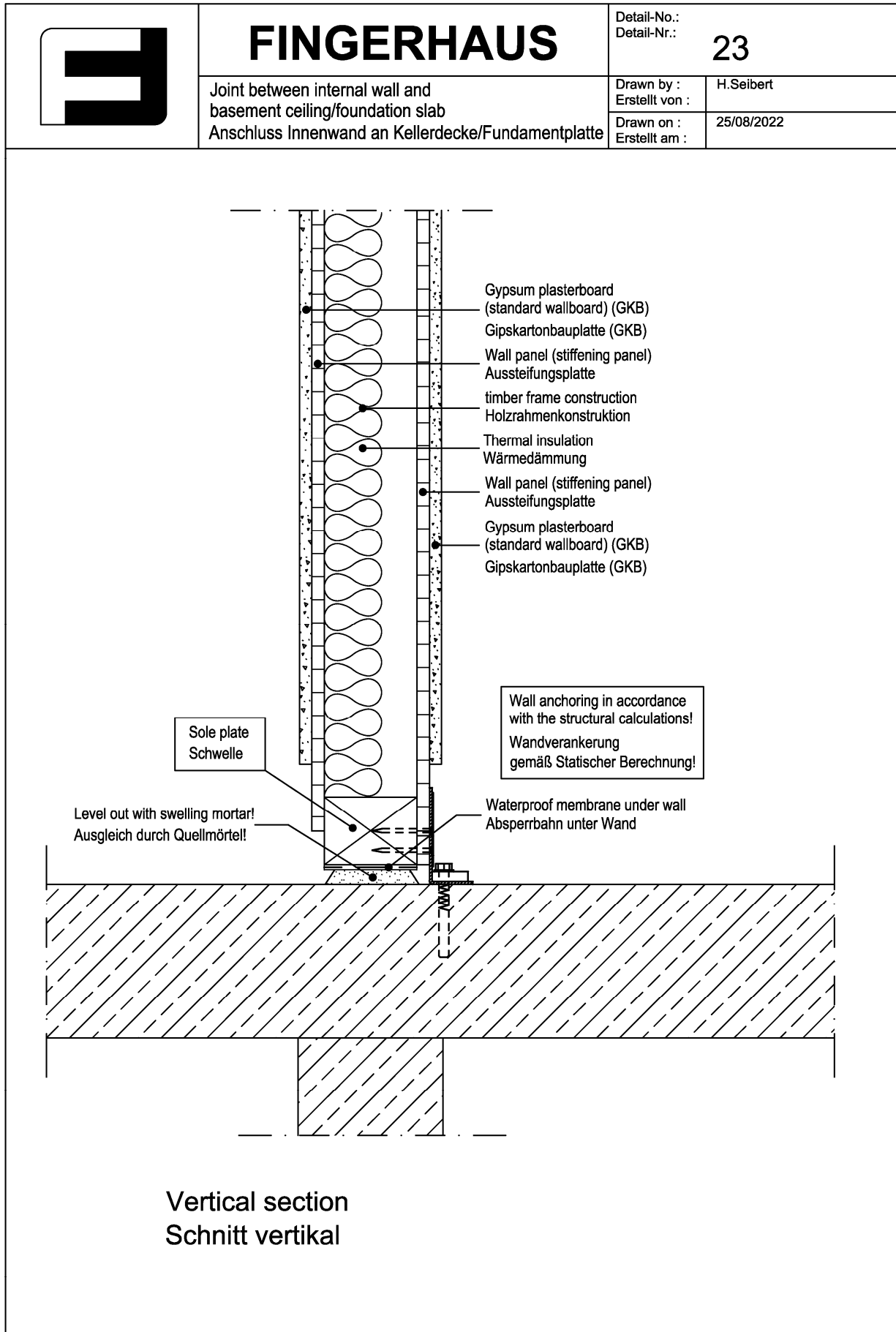
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	Drawn on : Erstellt am : 25/08/2022

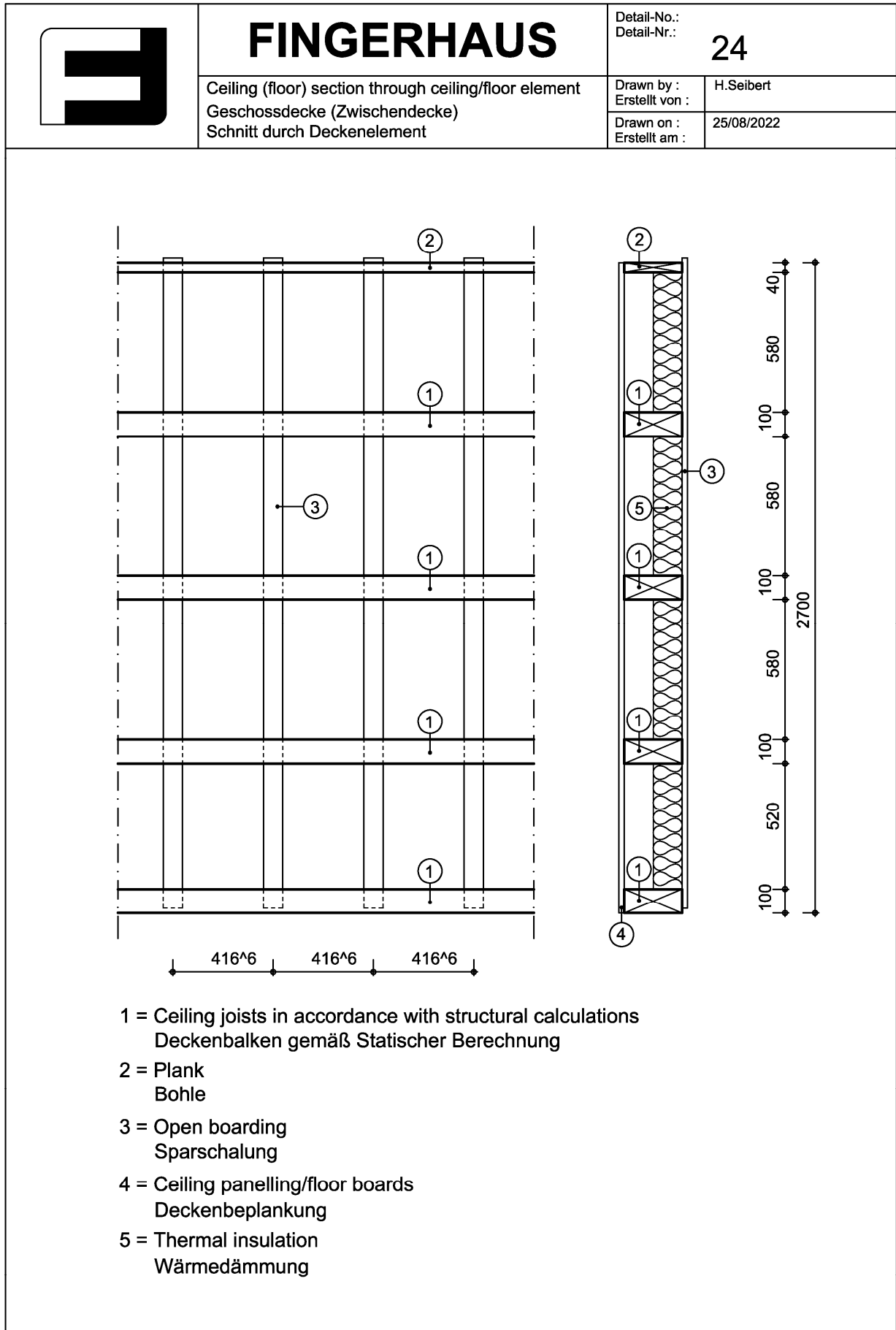
FINGERHAUS	Wall joint: internal wall joint with internal wall Wandanschluss: Innenwand an Innenwand
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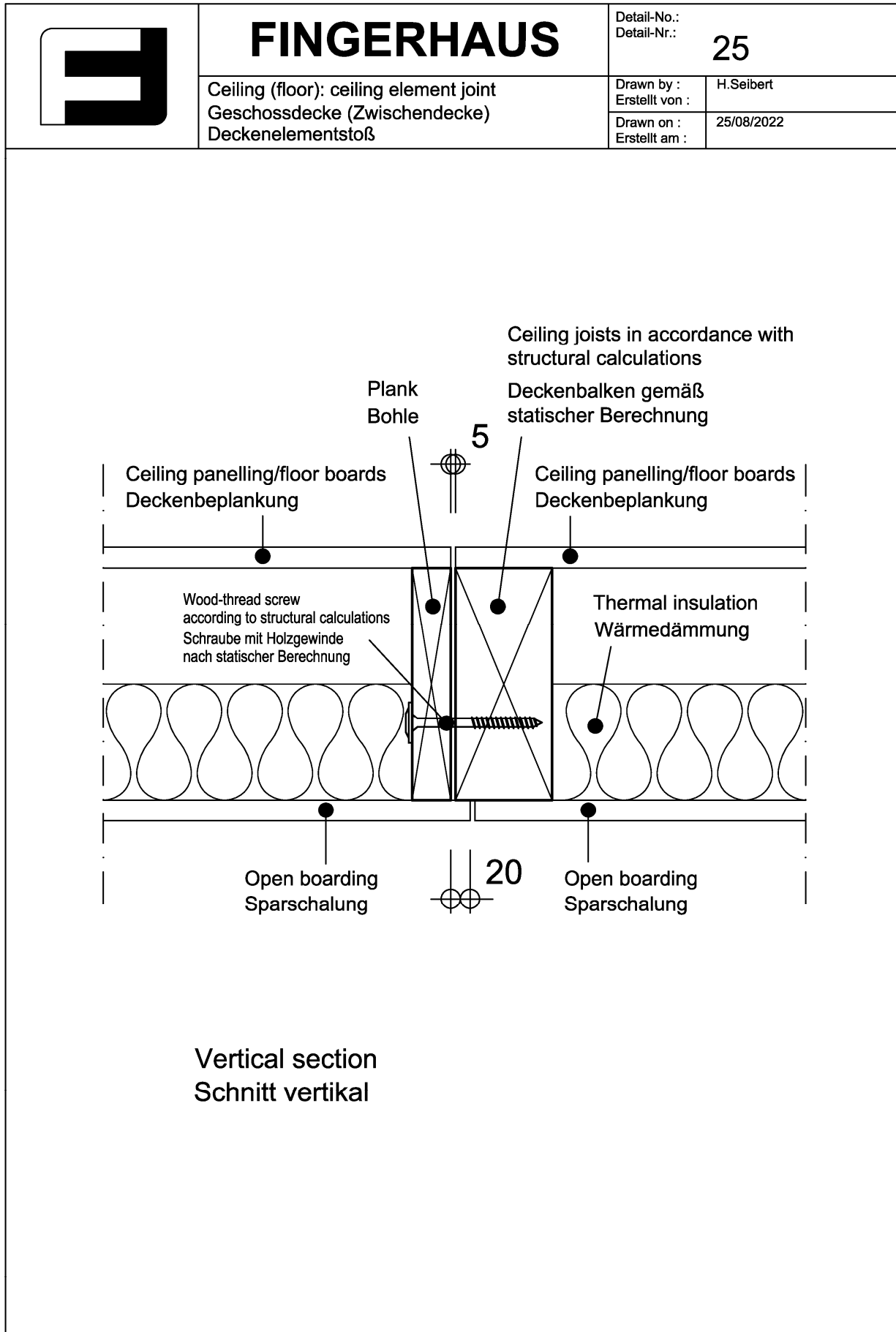


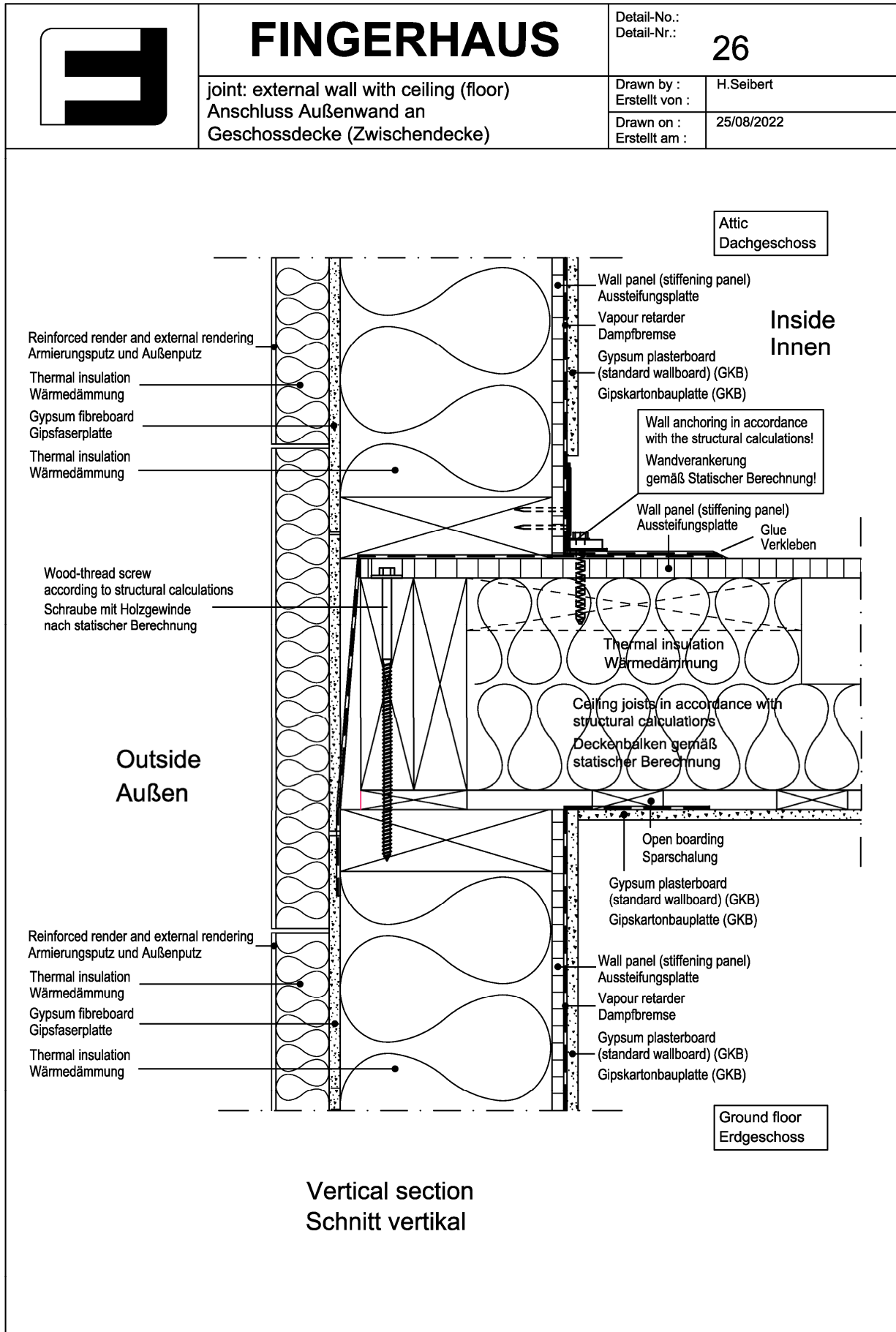












	<h1>FINGERHAUS</h1>	Detail-No.: Detail-Nr.: 27	
	Ceiling (floor): connection of the ceiling joists Geschossdecke (Zwischendecke) Verbindung der Deckenbalken		Drawn by : Erstellt von : H.Seibert
		Drawn on : Erstellt am : 25/08/2022	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> </div> <div style="width: 50%;"> <p>1 = Ceiling / floor element Deckenelement</p> <p>2 = Ceiling joists Deckenbalken</p> <p>3 = Joist hanger in accordance with structural calculations Balkenschuh gemäß Statischer Berechnung</p> <p>4 = Ceiling panelling / floor boards Deckenbeplankung</p> </div> </div>			
<p>Install wood-based board on construction site Holzwerkstoffplatte auf Baustelle einbauen</p>			
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>1 = Ceiling / floor element Deckenelement</p> <p>2 = Steel girder in accordance with structural calculations Stahlträger gemäß statischer Berechnung</p> <p>3 = Packing piece Füllholz</p> <p>4 = Ceiling panelling / floor boards Deckenbeplankung</p> </div> <div style="width: 50%;"> <p>Plan view of steel girder Draufsicht Stahlträger</p> </div> </div>			

