# DEUTSCHES INSTITUT FÜR BAUTECHNIK

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## General Building Permit from the Building Supervisory Authority

Permit Number: Z-9.1-315

Applicant: TEK Dach & Wand Bauelemente GmbH
Güterbahnhofstraße 8
16348 Klosterfelde

Subject of Permit: TEK Elements
Sandwich elements as load bearing and bracing wall and roof components with planking made from laminated flat pressed board with a polyurethane rigid foam core.

Valid until: 31 March 2005

The subject of this permit mentioned above is hereby generally authorised by the building authorities.*
This general building permit consists of eleven pages and ten appendices.

* This general building permit replaces the general building permit No. Z-9.1-315 dated 17 March 1995, amended by the decision of 10 August 1995 and 14 March 1996.
This subject was authorised for the first time on 17 March 1995 by the building supervisory authorities.

# I. GENERAL TERMS

1. The general building permit proves the usability or applicability of the subject of the building permit in the sense of the building regulations of the *Länder* [German federal states].

2. The general building permit does not replace the approvals, agreements and certifications which are required under law for the execution of any intended building.

3. The general building permit is issued without prejudice to the rights of third parties, especially private property rights.

4. Manufacturers and distributors of the subject of this permit are, without prejudice to the more extensive regulations in “Specific Terms”, to provide the user or consumer of the subject of the permit with copies of the general building permit and to indicate that the general building permit must be available on the application premises.

5. The general building permit may only be duplicated in full. The publication of extracts thereof requires the approval of the Deutsches Institut für Bautechnik. Texts and drawings from advertising brochures must not contradict the general building permit. Translations of the general building permit must contain the reference “Vom Deutschen Institut für Bautechnik nicht geprüfte Übersetzung der deutschen Originalfassung” [Translation of the original German Version not checked by the Deutsches Institut für Bautechnik”].

6. The general building permit is issued irrevocably. The terms of the general building permit may subsequently be expanded and amended, especially if new technical findings so require.

7. The building products named in the general building permit require proof of their conformity (conformity proof) and the code with the conformity sign (Ü-sign) in accordance with the conformity regulations of the *Länder*.

# II. SPECIAL TERMS

## 1. Subject of the Permit and Field of Application

### 1.1 Subject of the Permit

The TEK elements (sandwich elements) consist of two outer cover layers of at least 16 mm thick laminated flat pressed board (particle board) in accordance with DIN 68 763:1990-09 and a 110 mm thick injected polyurethane (PUR) rigid foam core in accordance with DIN 18 164-1:1992-08 (See Appendix 1). In addition to these standards and irrespective of these, any further demands of the special terms are to be taken into account.
The TEK elements and their parts, as well as their manufacturing conditions must correspond to the information submitted to the DIBt.

### 1.2 Field of Application

1.2.1 The TEK elements are to be used as load bearing, bracing or non-load bearing wall and roof components for single and two storey buildings and for attic storeys in multi-storey buildings, provided that the demands of regulations in other fields, e.g. fire safety, do not specify otherwise.

1.2.2 In buildings to be used for commercial purposes, only predominantly static moving loads in accordance with DIN 1055-3:1971-06 - Load Information for Buildings: Moving Loads - are permitted.

1.2.3 For external building components, long lasting water protection is to be used to ensure that harmful influences such as moisture, and especially condensation, can be avoided in the long term.

1.2.4 The TEK elements should not be used in cellars or basements, wet rooms (bathrooms and kitchens in residential buildings are not considered as wet rooms) and for outbuildings.

## 2. Terms for the TEK Elements and Wall and Roof Components Made Thereof

### 2.1 Properties and Composition

2.1.1 Laminated flat pressed board
The laminated flat pressed board (particle board) must conform to the standard DIN 68 763:1990-09 – Laminated Flat Pressed Board for Construction: Terms, Demands, Testing, Monitoring.
In addition to the demands of the DIN 68-763 standard, the following properties must also be shown:

a) Flectional strength when load placed on flat surface (Edge flectional strength)

$ß_{Bxz} \geq 12$ N/mm$^2$

The associated flectional elastic modulus must be at least

$E_{Bxz} = 2350$ N/mm$^2$.

b) Tensile strength under load on flat surface

$ß_{Bxz} \geq 7.8$ N/mm$^2$

The associated flectional elastic modulus must be at least

$E_{Bxz} = 2550$ N/mm$^2$.

For the testing of the properties listed under a) and b), the information in Sections 2.3.2. and 2.3.3 of this general building permit applies.

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2.1.2 Polyurethane Rigid Foam

The polyurethane (PUR) rigid foam must conform to the standard DIN 18 164-1:1992-08 - Foam plastics as insulating material for building: insulating materials for heat insulation.
In addition to the demands of this standard, the following properties must also be shown:

a) Raw density at least 33 kg/m$^3$
b) Shear modulus at least 4 N/mm$^2$
c) Modulus of elasticity in tension $E_Z \geq 4.5$ N/mm$^2$
d) Modulus of elasticity under compression $E_D \geq 4.5$ N/mm$^2$.

For the testing of the properties listed above, the information in Section 2.3.2 of this general building permit applies.

2.1.3 Sandwich Construction of Laminated Flat Pressed Board/Hard PUR Foam

The following demands are placed on the sandwich building:

a) Shear modulus at least 0.12 N/mm$^2$
b) Tensile strength at least 0.07 N/mm$^2$
c) Compressive strain at 10 % compression set at least 0.8 N/mm$^2$.

For the testing of the properties listed above, the information in Section 2.3.2 of this general building permit applies.

2.1.4 TEK Elements

2.1.4.1 General

The cross sectional building of the TEK elements must be symmetrical (see Appendix 1), consisting of an internal 110 mm thick polyurethane rigid foam core, moulded as foam in the manufacturing process, in accordance with Section 2.1.2 and cover layers of at least 16 mm thick laminated flat pressed board in accordance with Section 2.1.1.
The laminated flat pressed boards must have been cleaned on their adhering sides before the insertion of the foam.
No additional fixing is required alongside the adhesion between the laminated flat pressed boards and the hard PUR foam created when the foam is added and hardened.

2.1.4.2 Wall Components

2.1.4.2.1 The height of wall components may not exceed h = 3.0 m.

2.1.4.2.1 a) The width of the wall component as an individual element (monolithic detachable element) must be at least b = 1.25 m (See Appendices 2 and 2a). In this case, a frame extending over several individual elements is required at the top and bottom of the wall component, or a threshold of solid wood (pine) in accordance with DIN 1052-1[1], of at least Grade S10 in accordance with DIN 4074-1:1989-09 with a height of $h_1 = \geq 50$ mm and a width of $b_1 = 110$ mm is to be nailed in place (See Appendix 2). The nailed down wood may also be dovetail jointed.
The vertical edges of the wall component may be constructed without ribs. The connection of individual elements with or without openings to the built wall components must be made where the laminated flat pressed boards abut on the inside using connector elements made of laminated flat pressed board strips (tongues), wood (not necessarily throughout), sandwich element strips or using some other constructional equivalent (See Appendices 3 and 3a).

[1] Where DIN 1052 is referred to below, this also refers to the relevant amendment sheet A1.

b) For thrust rigid individual elements (See Appendix 2), nails should be much closer together at the top and the bottom than with simple vertical load bearing individual elements, and the threshold should be effectively and statically anchored. The same applies for two grid elements (see Appendices 3 and 3a).

2.1.4.2.3 Wall components with openings (window and door elements) are to be made in accordance with Appendices 4 to 7.
The openings are to be edged with wood (pine) ribs, at least Grade S10, at least 50 mm wide all round. Joints in the laminated flat pressed board and the hard foam are only permitted in their middles (zero radial stress area).
The support width of the supports may not be more than four times their support height.
Table 1 applies for the remaining element dimensions in the area of window and door openings.

Table 1: Demands on the remaining element dimensions in the area of window and door openings.

| | Window Element | Door Element |
|---|---|---|
| Width of wall element adjacent to opening $b^1$[m] | $\geq$ 0.20 | $\geq$ 0.45 |
| Elbow height $l_u$[m] | $\geq$ 0.80 | - |
| Support height $l_o$[m] | $\geq$ 0.50 | $\geq$ 0.50 |

2.1.4.2.4 The outer covering layer of external wall components must be made of laminated flat pressed board of class V100 derived timber product. For the inner covering layer of these components and for the covering lagers of interior building components, class 100G derived timber product laminated flat pressed board must not be used.

2.1.4.3 Roof Components

2.1.4.3.1 Roof components should be made of single span boards with or without cantilevers and of continuous boards.
The support width for single span boards should not exceed 3.50 m, and the length of the cantilever should not exceed 1.0 m. For continuous boards, the support width should not exceed 4.0 m.

2.1.4.3.2 The outer covering layer of roof components must be made of laminated flat pressed board of class V100 or V100G derived timber product. For the inner covering layer of these components, class 100G derived timber product laminated flat pressed board must not be used.

2.1.5 Joints and Fixings

Squared timber (frames, thresholds) and strips are to be attached using 2.8 x 63 special nails of bearing class III in accordance with DIN 1052-2:1988-04.
For the attachment of the strips, 2.8 x 35 special nails of bearing class III should also be used.
For the connection of the thresholds to the substructure, the following are to be used:

- hot dip galvanized M10 bolts, property class 8.8 in accordance with DIN EN 20 898-1:1992-04
- M10 bolts made of stainless steel according to the general building permit No. Z-30.3.3, Material No. 1.4401 or 1.4571.
- other threshold fixings according to specific static evidence.

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## 2.2 Manufacture, Packaging, Transport, Storage and Identification

2.2.1 Manufacture

The manufacture of the TEK elements takes place continuously in a continuous press, whereby a liquid foam mixture is sprayed in between the laminated flat pressed boards, kept 110 mm apart. When this mixture foams, it creates an adhesive bond between the laminated flat pressed boards.

The TEK elements are cut for their specific purpose directly after manufacture and are then stored to harden.

The manufacturer places high demands on the faultless working methods of the production plants and the monitoring of the production process.

2.2.2 Packaging, Transport, Storage

Specific packaging is provided for transport and for storage of the wall and roof components, ready to be used, on the building site, which does not damage the parts and does not become unacceptably damp.

Damaged wall and roof components should not be used in building.

2.2.3 Identification

The wall and roof components and the delivery note for the components must be identified by the manufacturer with the conformity sign (Ü-sign) in accordance with the conformity regulations of the *Länder*. Identification can only be carried out if the requirements of Section 2.3 have been fulfilled.

In addition, the delivery note should contain at least the following information:

Designation of the Subject of the Permit

Manufacturing Plant

If the use of V100G derived timber product laminated flat pressed boards is specified for an application in accordance with DIN 68800-2:1996-05, these external wall and roof components should be identified clearly with “Inside” and “Outside”.

## 2.3 Conformity Proof

2.3.1 General

The confirmation of conformity of wall and roof components made of sandwich elements under the terms of this general building permit must be achieved for each manufacturing plant with a conformity certificate on the basis of the plant’s own production controls and regular outside monitoring, including an initial examination of the TEK elements under the following conditions.

For awarding the conformity certificate and the outside monitoring, including the product testing to be carried out as part of this, the manufacturer of the TEK elements is to use a recognised certification office or a recognised monitoring office.

The Deutsches Institut für Bautechnik is to be given a copy of the conformity certificate issued by the certification office.

The Deutsches Institut für Bautechnik is also to be given a copy of the initial examination report, for information purposes.

2.3.2 Internal Production Controls

Internal production controls are to be set up and carried out within each manufacturing plant. Internal production controls are taken to mean the continual monitoring of production carried out by the manufacturer, whereby the latter ensures that the building products that he manufactures correspond to the terms of this general building permit.

The internal production controls are to include at least the measures listed below:

- Description and examination of the finished materials

  Flectional strength of the laminated flat pressed boards when load placed on flat surface in a 3 point flexion test; support width ratio l: d = 20, whereby the average height of the test subject d must be at least twice the thickness of the board.

- Controls and tests which are carried out during manufacture.
- Proof and testing which are carried out on the finished product.

| | |
|---|---|
| - Raw density of the hard foam material | Test subject dimensions (in mm) 100 x 100 x c (c = core height) |
| - Thrust strength of core compound<br>- Thrust modulus of core compound | 4point flexion test based on DIN 53 293 with reduced beam lengths $L_a$ – 18 h, L = 20 h, (h = height of the overall cross section of the sandwich element), test speed 8 mm/min |
| - Tensile strength of core compound<br>- Elasticity E modulus ($E_Z$) of hard foam | Tension test at right angle to cover layer level on the core compound based on DIN 53 292; Test subject dimensions (in mm): 100 x 100 x h |
| - Compressive strain of core compound at 10 % compression<br>- Compression E modulus ($E_D$) of hard foam | Compression test at right angle to cover layer level based on DIN 53 291; Test subject dimensions: 100 x 100 x h |

The results of the internal production controls are to be noted and analysed. The notes should contain at least the following information:

- Designation of building product or finished material
- Type of control or test
- Date of manufacture and testing of building product
- Result of controls and tests
- Signature of person responsible for the internal production controls

The notes are to be retained for at least five years and made available to the monitoring office used for the outside monitoring. They are also to be made available to the Deutsches Institut für Bautechnik and the highest building supervisory authorities responsible on request.

If the test results are insufficient, the manufacturer is to take appropriate measures without delay to rectify the defect. Construction products which do not fulfil requirements are to be managed in such a way that there is no possibility of confusing them with conforming products. After the fault has been remedied, the test involved must be repeated without

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delay – as far as this is technically possible and necessary to demonstrate that the fault has been remedied.

2.3.3 External Supervision

The internal production control in each manufacturing plant must be monitored regularly using external supervision, at least twice a year.

Part of the external supervision must consist of an initial testing of the TEK elements and can also involve taking samples for spot checks. The recognised supervisory agency is responsible for sampling and the testing.

The following tests are the minimum requirement for external supervision:

all the tests required in the section 2.3.2 as well as

tensile strength of the laminated flat pressed boards with load on the board surface plane according to DIN EN 789:1996-07

The certification and external supervision results are to be kept for a minimum of five years. They must be submitted to the Deutsches Institut für Bautechnik and the relevant highest inspector of works by the certifying agency or the supervisory agency when requested.

## 3 Design and dimensioning regulations

### 3.1 General

3.1.1 The DIN 1052-1: 1988-04 - wooden structures - applies to the design and dimensioning of structures manufactured from TEK elements, in as far as no other instructions to the contrary are given here.

3.1.2 Proof must be furnished, in each individual case, of the stability of buildings where TEK elements are used.
The wall unit anchorages must be shown to be compliant with DIN 1052-2: 1988-04.

3.1.3 The relevant regulations, standards and guidelines prescribed apply to the necessary demonstration of compliance with regard to heat insulation, damp proofing, sound proofing and fire proofing. The DIN 68 800-2: 1996-05 and –3: 1990-04 standards apply to the preventative wood preservation for the wall and roof units manufactured from the sandwich elements.

### 3.2 Wall units

3.2.1 Single elements and composite elements (single and double grid elements)
- Single loads on the upper edge of the elements are to be distributed evenly across the width of the element.
- The minimum contact length must not be less than 0.045 m.
- In relation to the thickness of the element d, the load must not be more than e = d/6 off centre.
- In the recording of the bearing compression , the permitted compressive strain (on the board surface planes) of the planking must not exceed $\sigma Dx = 2.75\ MN/m^2$.
- The vertical loads N and the horizontal loads $F_H$ given in tables 2 and 3 can be specified as also applying to the wall unit.
- The wind load affecting the wall areas are only to be overlaid with the vertical loads N according to table 2. Here the following proof is to be furnished:

$$\frac{N}{\text{zul } N} + \frac{M}{c_M \bullet \text{zul } M} \leq 1$$

whereby the following applies: zul N (permitted N) acccording to Table 2
zul M (permitted M) acccording to Table 2

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$c_M$ = 1.0 for load case H
$c_M$ = 1.25 for load case HZ

Table 2: permitted loads for whole elements and elements with breakthrough in the area of the full cross-section (Q)

| load | zul [permitted] Q [kN/m] | l = 2.45m | l = 2.7m | l = 3.00m |
|---|---|---|---|---|
| right angled to the surface plane | zul [permitted] M [kNm/m] | 2.8<br>2.0 | | |
| load parallel to the surface plane | zul [permitted] N [kN/m] | 35.25[1.2] | 0.87 * 35.35[1.2] | 0.75 * 35.35[1] |
| [1] between l = 2.45 and l = 3.00 m may be interpolated linearly<br>[2] In the area of individual loads zul [permitted] N = 51.5 kN/m may not be exceeded. However, overall the highest value zul [permitted] N is to be adhered to. | | | | |

Table 3: permitted horizontal loads $F_H$ in kN/m of single and double grid elements with load parallel to the surface plane

| element length<br>element width | 1 = 2.45 m[1] | 1 = 2.75 m[1] | 1 = 3.00 m[1] |
|---|---|---|---|
| b = 1.25 m[2] | 1.75 | 0.87 • 1.75 | 0.75 • 1.75 |
| b = 2.5 m[3] | 7.25 | 0.87 • 7.25 | 0.75 • 7.25 |
| 1 between l = 2.45 and l = 3.00 m may be interpolated linearly<br>2 according to Appendix 2<br>3 according to Appendix 3 | | | |

3.2.2 Door and window lintels

- The documentation of the lintels under bending load caused by vertical loads must be made in accordance with DIN 1052-1. In this case the PUR rigid foam must not be taken into consideration, but may be included as buckling reinforcing for the outer layers without any certification.

- In the case of the proof of stability according to DIN 1052-1: 1988-04, Section 8.3 for girders subject to bending from cross-section parts bound together flexibly, contrary to DIN 1052 –1, Table 6, the tensile stress for the 16 mm thick laminated flat pressed boards is to be limited to $\sigma Zx = 2.0$ MN/m$^2$.

## 3.3 Roof units

3.3.1 - In the case of the proof of stability for roof units (see Section 2.1.4.3.1) the shearing forces and moments must be based on

zul [permitted] Q = 2.8kN/m
zul [permitted] M = 2.0kN/m

- The compressive strains at right angles to the element surface planes that result from bearing forces are to be shown for the rigid foam core in the gravitational plane of the element and should not exceed $\sigma D\perp = 0.05$ MN/m$^2$. A load spread under 45$^o$ can be assumed for the theoretical compression distribution length in lengthwise direction in the element.

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- When calculating the cutting dimensions of statically undetermined systems, the thrust deformation of the core material is to be taken into consideration. The calculation can be made by approximation according to the linear sandwich membrane theory (not taking into consideration the inherent flexural strength of the outer layers) or according to the girder theory by including the thrust deformation. Repositioning of the section values as a result of creep do not need to be taken into consideration. With regard to the elasticity values for laminated flat pressed boards $E_D$ (0) and the PUR rigid foam core $G_K$ (0) to be used in the calculation, data given in Section 3.3.2 applies.

3.3.2 The proof of stability for roof plates (see Section 2.1.4.3.3) is to be carried out analogously according to DIN 1052-1: 1988-04, Section 8.3. Here the tensile stress for the 16 mm thick laminated flat pressed boards is to be limited to $\sigma Zx = 2.0$ MN/m$^2$, contrary to DIN 1052 –1, Table 6.

- The deflexions of roofing elements are to be demonstrated, taking into consideration the effects of time. The deformations can be calculated by approximation according to the linear sandwich membrane theory or according to the girder theory by including the thrust deformations with the time dependent elasticity values (or creep measurements) of the outer layers and the PUR rigid foam core
$E_D (t) = E_D (0)/(1+ \varphi ED (t))$, $G_K (t) = G_K (0)/(1+ \varphi G_K (t))$
$E_{D (0) = 2000 MN/m^3}$, $G_K (0) = 4$ MN/m$^3$

The final values of the deflexions are to be determined differentiated according to load. The values of the creep measurements at the point in time t = 10# h are to be used for inherent weight and constant load and for snow the creep measurements at the point in time t = 2000 h:

$\varphi ED (2000) = 0.75$, $\varphi ED (10^5) = 2.25$
$\varphi GK (2000) = 1.5$, $\varphi GK (10^5) = 6.5$

The final values of the deflexions must not exceed 1/100 of the bearing span.

## 4 Regulations for the implementation

### 4.1 General

When building structures using TEK elements made from sandwich elements, the following apply: DIN 1052-1 and DIN 68 800-2: 1996-05 - wood preservation; preventative building measures in superstructures – in as far as no other instructions to the contrary are given here.

The building of building structures using TEK elements according to Section 1.1 in the area of application according to Section 1.2, is to be carried out only by the manufacturer or by timber building businesses with the qualifications and briefing to do so ( recorded proof that the manufacturer has briefed the business is required).

### 4.2 Wall units

4.2.1 Hot galvanized M 10 bolts or stainless steel M 10 bolts with washers or other anchorages with proven static must be used to attach the wall units that function as thrust elements (according to Appendices 2 and 3) to the substructure.

The anchoring to the substructure, e.g. using dowels generally approved by the building authorities, must be friction-locked.
All other wall units (see Appendices 2a, 3a, 4 and 5) must be anchored structurally.

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4.2.2 The bearing narrow sides of the laminated flat pressed boards must be permanently protected from mechanical damage and from damp, e.g. splash water, in particular by the use of structural measures (see also Appendix 8), if necessary also by means of suitable permanently elastic seals.

4.2.3 The connection of TJI girders according to the general building permit Z-9.1-277 to TEK wall units with HWS preforms of the type MIT and ITT is permitted if the regulations of the general building permit No. Z-9.1-302 are complied with.

The connection is to be carried out using special nails according to DIN 1052-2 of at least bearing class II.

4.2.4 In the case of outside wall units a permanent weather protection is to be ensured as follows:

- Exterior sited, directly applied insulating composite system (WDVS) with a general building permit for use on bases made from laminated flat pressed boards in accordance with DIN 68 763;
- curtain shell, ventilated at rear, with additional water repellent layer on the outer laminated flat pressed board with $S_{a=} \geq 1m \leq 2m$;
- curtain shell, not ventilated at rear, with additional water repellent layer on the outer laminated flat pressed board with $S_{a=} \geq 1m \leq 2m$;
- masonry shell facing with $\geq$ 40 mm air space up to the covering of the TEK element, with extension of the ventilation openings in accordance with DIN 1053-1 as well as covering of the TEK element
a) by a water repellent layer with $S_{a=} \geq 1m \leq 2m$;
b) by rigid foam boards in accordance with DIN 18164-1, $\geq$ 20mm thickness;
c) by mineral fibre insulation boards in accordance with DIN 18 165-1 with water repellent outer layer with $S_{a=} \geq 1m \leq 2m$.

The suitability of systems of permanent weather protection diverging from this, must be demonstrated by the test certificate of the Forschungs- und Materialprüfungsanstalt [research and material testing institute] Baden-Württemberg in Stuttgart or the Wilhelm-Klauditz-Institut für Holzforschung [wood research] (WKI) in Braunschweig.

## 4.3 Roofing elements

An efficient weather protection against the direct effect of damp must be put onto roofing units.

## 4.4 Acceptance test

A recognised building supervisory agency for monitoring the transport and mounting of the subject of the permit must supervise that the provisions in Sections 2.2.2 and 4 dealing with transport and storage or with the mounting of the wall and roofing units are adhered to.

The supervision report must be kept for at least five years by the company carrying out the building, and must be submitted to the Deutsches Institut für Bautechnik or the relevant inspector of works when requested.

p.p.
Balmer

Sworn
[signature]

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Flachpressplatte V 100 nach DIN 68763 - laminated flat pressed board V 100 according to DIN 68763

Polyurethanhartschaumkern – polyurethane rigid foam core
( formgeschäumt ) – (foamed in the mould)
nach DIN 18164 Teil 1 – according to DIN 18164 Part 1

Flachpressplatte V 100 nach DIN 68763 - laminated flat pressed board V 100 according to DIN 68763

Maße in mm- dimensions in mm

## Benennung - title
## Aufbau der TEK-Elemente – structure of the TEK elements

**Anlage: 1 zur allgemeinen bauaufsichtlichen Zulassung Nr. Z-9.1-315 vom 30.März 2000 –**
**Appendix 1 to the general building permit number Z-9.1-315 dated 30 March, 2000**

[stamp]

Detail B = detailed drawing  Schnitt B-B = Section B-B

Flachpressplatte V 100 = laminated flat pressed board V 100

durchlaufendes Holz ≥ 50 x 110 Sortierklasse S 10 = continuous wood ≥ 50 x 110, sort grade S 10

Flachpressplatte V 100 = laminated flat pressed board V 100

Fußschwelle = inferior purlin

gemäß statischem Nachweis = according to static demonstration

Abstand der Befestigungspunkte gem. Detail = spacing of the attachment points according to detailed drawing

Detail B - detailed drawing B  Detail A (siehe Anlage 6) = detailed drawing A (see Appendix 6)

Schnitt A – A = section A – A
Befestigung gem. Anl. 6 o. 7 = attachment according to Appendix 6 or 7

Detail B = detailed drawing B
Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III
Nagelbild vorn (hinten spiegelbildlich) = positioning of nails at the front ( mirror image in rear) = positioning of nails at the front ( mirror image in rear)

Maße in mm = dimensions in mm = dimensions in mm

## Benennung = title
## Schubsteifes Wandbauteil (Einraster-Element) = thrust rigid wall unit ( single grid element)

**Anlage: 2 zur allgemeinen bauaufsichtlichen Zulassung Nr. Z-9.1-315 vom 30.März 2000 =**
**Appendix 2 to the general building permit number Z-9.1-315 dated 30 March, 2000**

[stamp]

Detail B = detailed drawing B  Schnitt B-B = section B-B

Flachpressplatte V 100 = laminated flat pressed board V 100

durchlaufendes Holz ≥ 50 x 110 Sortierklasse S 10 = continuous wood ≥ 50 x 110, sort grade S 10

Flachpressplatte V 100 = laminated flat pressed board V 100

gemäß statischem Nachweis = according to static demonstration

Fußschwelle = inferior purlin

Detail B = detailed drawing B Detail A (siehe Anlage 6) = detailed drawing A (see Appendix 6)

Schnitt A – A = section A – A

Detail B = detailed drawing B

Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III
Nagelbild vorn (hinten spiegelbildlich) = positioning of nails at the front ( mirror image in rear) = positioning of nails at the front ( mirror image in rear)

Maße in mm = dimensions in mm

Benennung = title
Vertikallastabtragendes (Einraster-Element) =
vertical load removing (single grid element)

**Anlage: 2a zur allgemeinen bauaufsichtlichen Zulassung Nr. Z-9.1-315 vom 30.März 2000 =**
**Appendix 2a to the general building permit number Z-9.1-315 dated 30 March, 2000**

[stamp]

Detail C = detailed drawing C  Detail B = detailed drawing B  Schnitt B-B = section B-B

Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III
Nagelbild vorn (hinten spiegelbildlich) = positioning of nails at the front (mirror image in rear)

Detail B = detailed drawing B Detail A (siehe Anlage 6) = detailed drawing A (see Annex 6)

Detail D (Variante 1-3) = detailed drawing D ( version 1 – 3)

Schnitt A-A = section A-A

Befestigung gem. Detail = mounting according to detailed drawing

Detail D (Variante 1) = detailed drawing D (version 1)
Detail D (Variante 2) = detailed drawing D (version 2)
Detail D (Variante 3) = detailed drawing D (version 3)

Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III
Feder aus Flachpressplatte 100 x 16 = spring from laminated flat pressed board 100 x 16 = spring from laminated flat pressed board 100 x 16
Ortsschaum DIN 18159 Teil # = in situ PUR foam DIN 18159 Part #
PUR Hartschaum DIN 18164 Teil # = PUR rigid foam DIN 18164 Part #
Flachpressplatte DIN 68763 = laminated flat pressed board DIN 68763

Vollholz 110 x 100 durchgeh. o. nicht durchgeh. = solid wood 110 x 100 full length or not full length = solid wood 110 x 100 full length or not full length
Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III

Paneel durchgeh. 100 x 110 mit 2x Flachpressplatte = panel full length 100 x 110 with 2 x laminated flat pressed boards = panel full length 100 x 110 with 2 x laminated flat pressed boards

Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III

## Benennung = title
## Schubsteifes Wandbauteil (Zweiraster-Element) = thrust rigid wall unit (two grid elements)

**Anlage: 3 zur allgemeinen bauaufsichtlichen Zulassung Nr. Z-9.1-315 vom 30.März 2000 =**
**Appendix 3 to the general building permit number Z-9.1-315 dated 30 March, 2000**

[stamp]

Detail C = detailed drawing C  Detail B = detailed drawing B  Schnitt B-B = section B-B

Detail C = detailed drawing C

Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III
Nagelbild vorn (hinten spiegelbildlich) = positioning of nails at the front ( mirror image in rear)

Detail B = detailed drawing B Detail A (siehe Anlage 6) = detailed drawing A (see Appendix 6)

Detail D (Variante 1-3) = detailed drawing D (version 1 - 3)

Schnitt A-A = section A-A

Befestigung gem. Detail = mounting according to detailed drawing

Detail D (Variante 1) = detailed drawing D (version 1)  Detail D (Variante 2) = detailed drawing D (version 2)  Detail D (Variante 3) = detailed drawing D (version 3)

Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III
Feder aus Flachpressplatte 100 x 16 = spring from laminated flat pressed board 100 x 16
Ortsschaum DIN 18159 Teil 1 = in situ PUR foam DIN 18159 Part 1
PUR Hartschaum DIN 18164 Teil 1 = PUR rigid foam DIN 18164 Part 1
Flachpressplatte DIN 68763 = laminated flat pressed board DIN 68763

Vollholz 110 x 100 durchgeh. o. nicht durchgeh. = solid wood 110 x 100 full length or not full length
Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III

Paneel durchgeh. 100 x 110 mit 2x Flachpressplatte = panel full length 100 x 110 with 2 x laminated flat pressed boards
Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III

## Benennung = title
## Vertikallastabtragendes Wandbauteil (Zweiraster-Element) = vertical load removing (dual grid element)

**Anlage: 3a zur allgemeinen bauaufsichtlichen Zulassung Nr. Z-9.1-315 vom 30.März 2000 =**
**Appendix 3a to the general building permit number Z-9.1-315 dated 30 March, 2000**

[stamp]

Detail C = detailed drawing C
Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III
Nagelbild vorn und hinten = nail positioning front and rear

Detail B = detailed drawing B Schnitt B-B = section B-B

Detail C = detailed drawing C

Flachpressplatte V 100 = laminated flat pressed board V 100

durchlaufendes Holz ≥ 50 x 110 Sortierklasse S 10 = continuous wood ≥ 50 x 110, sort grade S 10

Flachpressplatte V 100 = laminated flat pressed board V 100

gemäß statischem Nachweis = according to static demonstration

umlaufendes Rähmholz 50 x 110 = wrap round wooden frame 50 x 110

Fußschwelle = inferior purlin

Befestigung gem. Anl. 6 o. 7 = mounting according to Appendix 6 or 7

Detail B = detailed drawing B Detail A (siehe Anlage 6) = detailed drawing A (see Appendix 6)

Detail B = detailed drawing B
Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III
Nagelbild vorn und hinten = nail positioning front and rear

Schnitt A-A = section A-A

## Benennung = title
## Fensterdetail = detailed drawing (window)

**Anlage: 4 zur allgemeinen bauaufsichtlichen Zulassung Nr. Z-9.1-315 vom 30.März 2000 =**
**Appendix: 4 to the general building permit number Z-9.1-315 dated 30 March, 2000**

[stamp]

Detail C = detailed drawing C
Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III
Nagelbild vorn und hinten = nail positioning front and rear

Detail C = detailed drawing CDetail B = detailed drawing B

durchlaufendes Sturzholz = continuous lintel wood

durchlaufender Stiel = continuous stay

Nagelverbindungen Rillen-Sondernägel 2,8 x 63 mm = nail connections special annular nails 2.8 x 63 mm

gemäß statischem Nachweis = according to static demonstration

Befestigung gem. Anl. 6 = mounting according to Appendix 6

Befestigung gem. Anl. 6 o. 7 = mounting according to Appendix 6 or 7

Detail B = detailed drawing B

Schnitt A-A = section A-A

## Benennung = title
## Türdetail = door detailed drawing

**Anlage: 5 zur allgemeinen bauaufsichtlichen Zulassung Nr. Z-9.1-315 vom 30.März 2000 =**
**Appendix 5 to the general building permit number Z-9.1-315 dated 30 March, 2000**

[stamp]

Detail A der Anlage 2, 2a, 3, 3a, 4 und 5 = detailed drawing A to Appendices 2, 2a, 3, 3a, 4 and 5

TEK-Element D = 142 mm = TEK element D = 142 mm

Anker M 10 mit Unterlegscheibe 34x11x3 nach DIN 440 = anchor M 10 with shim 34x11x3 according to DIN 440

Rillen-Sondernägel 2,8 x 63 mm Tragfähigkeitskl. III = special annular nails 2.8 x 63, bearing class III

durchlaufendes Holz 50 x 110 = continuous wood 50 x 110

imprägniertes Holz = impregnated wood

horizontale Sperrschicht gegen aufsteig. Feuchtigkeit = horizontal barrier layer against rising damp

Wärmedämmverbundsystem oder gleichwertiger Wetterschutz = insulating composite system or equivalent weather protection

Gelände = terrain

## Benennung = title
## Verankerung mit Anker für Innen- und Außenwände = anchoring with anchors for inside and outside walls

**Anlage: 6 zur allgemeinen bauaufsichtlichen Zulassung Nr. Z-9.1-315 vom 30.März 2000 =**
**Appendix 6 to the general building permit number Z-9.1-315 dated 30 March, 2000**

[stamp]

Detail C = detailed drawing C
Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III
Nagelbild vorn und hinten = nail positioning front and rear

Detail C = detailed drawing C Detail C = detailed drawing C Detail B = detailed drawing B

gemäß statischem Nachweis = according to static demonstration

Rähmholz = wooden frame
durchlaufender Stiel 100x110 = continuous stay 100x110

Nagelverbindungen Rillen-Sondernägel 2,8 x 63 mm = nail connections special annular nails 2.8 x 63 mm

Befestigung gem. Anl. 6 = mounting according to Appendix 6

Befestigung gem. Anl. 6 o. 7 = mounting according to Appendix 6 or 7

Detail B = detailed drawing B

Schnitt A-A = section A-A

Benennung = title
Türdetail mit eingepaßtem Sturz =
door detailed drawing with fitted lintel

**Anlage: 7 zur allgemeinen bauaufsichtlichen Zulassung Nr. Z-9.1-315 vom 30.März 2000 =**
**Appendix 7 to the general building permit number Z-9.1-315 dated 30 March, 2000**

[stamp]

Detail C = detailed drawing C
Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III
Nagelbild vorn und hinten = nail positioning front and rear

Detail C = detailed drawing C Detail B = detailed drawing B Schnitt B-B = section B-B

durchl. Stiel 100 x 110 = continuous stay 100x110

gemäß statischem Nachweis = according to static demonstration

Flachpressplatte V 100 = laminated flat pressed board V 100

durchlaufendes Holz ≥ 50 x 110 Sortierklasse S 10 = continuous wood ≥ 50 x 110, sort grade S 10

Flachpressplatte V 100 = laminated flat pressed board V 100

umlaufendes Röhmholz 50 x 110 = wrap round wooden frame 50 x 110

Fußschwelle = inferior purlin

Befestigung gem. Anl. 6 = mounting according to Appendix 6

Detail B = detailed drawing B

Detail A (siehe Anlage 6) = detailed drawing A (see Appendix 6)

Detail B = detailed drawing B Rillen-Sondern. 2,8 x 63 (DIN 1052 Teil 2) Tragfähigkeitskl. III = special annular nails 2.8 x 63 (DIN 1052 Part 2), bearing class III
Nagelbild vorn und hinten = nail positioning front and rear

Schnitt A-A = section A-A

## Benennung = title
## Fensterdetail mit eingepaßtem Sturz- u. Brüstungselement = detailed drawing (window) with fitted lintel and parapet elements

**Anlage: 8 zur allgemeinen bauaufsichtlichen Zulassung Nr. Z-9.1-315 vom 30.März 2000 =**
**Appendix 8 to the general building permit number Z-9.1-315 dated 30 March, 2000**

[stamp]