



TECHNICAL BULLETIN: Two-storey stands in Halls

Supplement to our "Technical Regulations" brochure

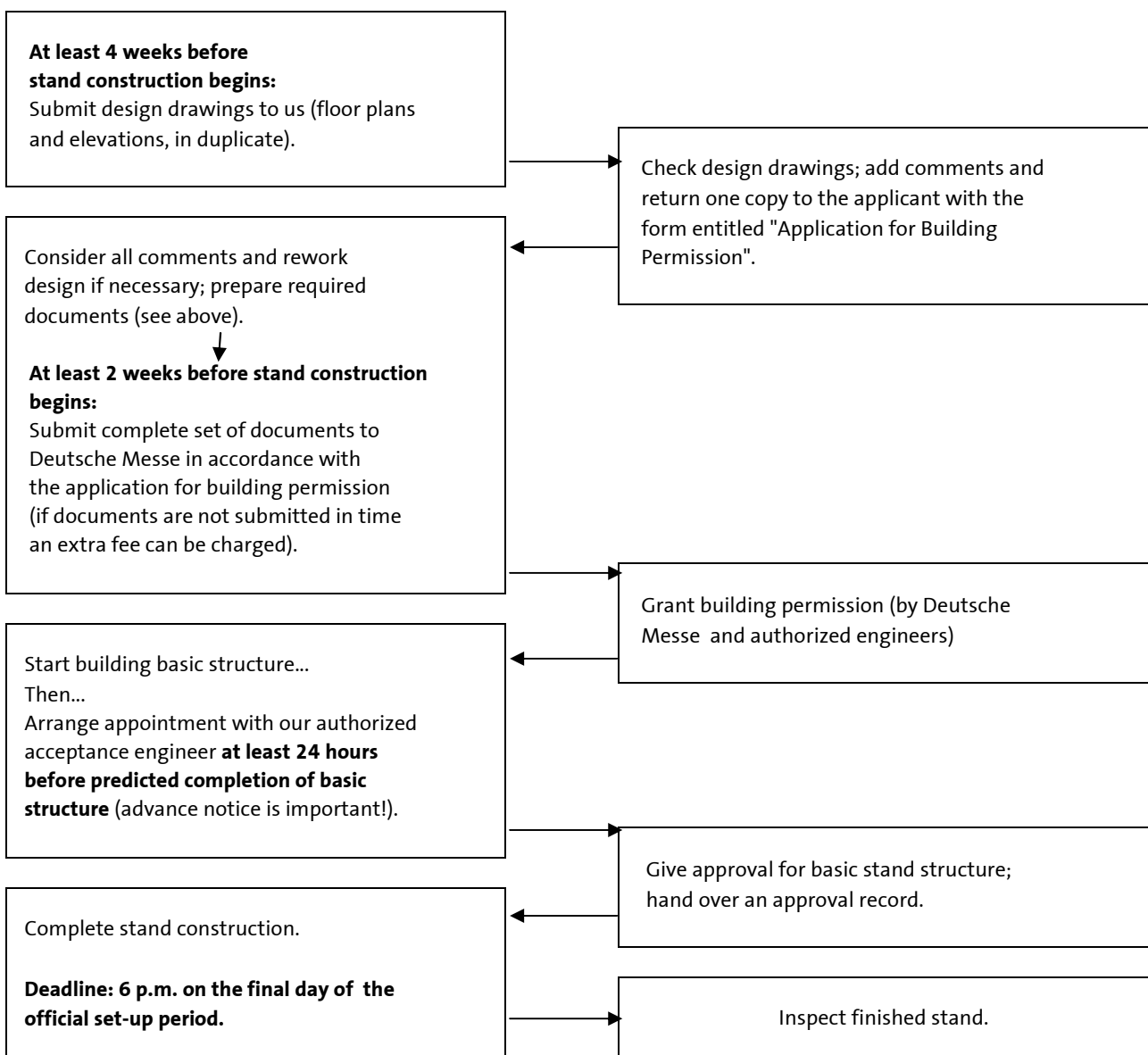
Procedure for obtaining building permission

Two-storey stands and special stand constructions require approval and are subject to specific conditions. Exhibitors will be invoiced for all expenses resulting from the approval process. Various documents must be submitted as part of the procedure, including:

- stand layout drawing showing all escape routes and their width in compliance with the Law on Public Assembly Venues (VStättVO-Niedersachsen) (in duplicate)
- structural integrity calculations verified by a second, independent structural engineer based on German standards and in German, including a position plan (one copy)
- description of stand, with details on materials used and their flammability classifications (in duplicate)
- stand construction drawings to a scale of 1:100, floor plan, elevations, sections, construction details in a larger scale (all in duplicate)
- verifiable area calculations of the usable upper storey area and supporting structure (each one copy)
- form "Application for Building Permission", completely filled in and signed by the exhibitor

What YOU need to do...

What WE do...



Technical requirements for two-storey stands in halls

Both the Lower Saxony Building Regulations (NBauO) and the Lower Saxony Law on Public Assembly Venues (NVStättVO) apply.

Stand height	<p>The maximum permissible construction height is 6.50 m (Hall 8: max. 6.00 m; Hall 18: max. 4.50 m; max. height in the pavilions on request). Actual clearance may be lower in some locations. Advertising mounted along stand perimeters must be at least 1.00 m away from neighboring stands.</p>									
Stand design	<ul style="list-style-type: none"> • The sides facing neighboring stands must be closed, with surfaces of neutral appearance. • Rear walls of stands adjacent to neighboring stands must not be transparent and must be of a clean appearance and covered with a uniform, neutral color above a height of 2.50 m. • Sides of stands adjoining the aisles must be of a transparent design. Long, closed lengths of stand partitioning are not allowed along the aisles. • The floor of the upper storey may be installed up to a maximum of 3.50 m above the floor of the hall. • All ceilings must be at least 2.30 m high. 									
Working and design loads	<p>Stand designs must comply with the following DIN 1055 working load standard:</p> <ul style="list-style-type: none"> • conference, exhibition and similar areas 5.0 kN/m² • office and similar areas -- reduction possible to 3.0 kN/m² • stairways 5.0 kN/m² • horizontal load for balustrades and handrails at rail height 1.0 kN/m • horizontal load for outer walls on the upper level at a height of 1.00 m above floor level 1.0 kN/m <p>For all hall floors the maximum point load is 0.25 kN/cm². A base plate at least 300 x 300 mm in size must be used for loads of $p < 40$ KN to be borne by shaft and supply channel covers.</p>									
Escape routes	<ul style="list-style-type: none"> • From any location within the stand, a general hall aisle must be reachable within a walking distance of no more than 20 m. • Upper levels with a floor area > 100 m² must have a minimum of two stairways as escape routes. These stairways must be located at opposite extremes, and as far apart as possible. <p>The required number of escape routes (stairways, exits, corridors) and their minimum permissible width depend on the size of the upper storey and the number of persons that the upper storey can accommodate:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding-right: 20px;">≤ 100 m² :</td> <td style="padding-right: 20px;">1 escape route</td> <td style="text-align: right;">0.90 m wide</td> </tr> <tr> <td style="padding-right: 20px;">> 100 m² up to 200 m² :</td> <td style="padding-right: 20px;">2 escape routes</td> <td style="text-align: right;">0.90 m wide</td> </tr> <tr> <td style="padding-right: 20px;">> 200 m² to < 400 m² :</td> <td style="padding-right: 20px;">2 escape routes</td> <td style="text-align: right;">1.20 m wide</td> </tr> </table>	≤ 100 m ² :	1 escape route	0.90 m wide	> 100 m ² up to 200 m ² :	2 escape routes	0.90 m wide	> 200 m ² to < 400 m ² :	2 escape routes	1.20 m wide
≤ 100 m ² :	1 escape route	0.90 m wide								
> 100 m ² up to 200 m ² :	2 escape routes	0.90 m wide								
> 200 m ² to < 400 m ² :	2 escape routes	1.20 m wide								

Stairways	<p>All stairways must comply with DIN 18065 standards. Spiral stairs or stairs with a newel post are not acceptable as escape routes.</p> <ul style="list-style-type: none"> • Horizontally, steps must be completely closed. • The rise of each step may not exceed 19 cm, and the tread depth must be at least 26 cm along the main walking axis (middle of the steps). • Handrails are required on both sides of the stairway. They must provide a safe grip and be free of gaps, even on landings. • Handrail clearance to an adjacent structure must be at least 0.05 m. • The width of necessary stairways may not exceed 2.40 m. • Vertical clearance (headroom) on stairways must be at least 2.00 m.
Balustrades, safety railings	<ul style="list-style-type: none"> • Balustrades must be at least 1.00 m high (recommended height = 1.10 m) and consist of a top, middle and bottom rail. • In the case of open balustrades on upper floors, a strip of at least 0.05 m height must be mounted along the edge of the floor beneath the balustrade to prevent falling objects. • Outer walls on upper floors must be sufficiently stable so as to prevent accidental falling of persons or objects.
Stand ceilings	<p>Closed stand ceilings are permitted in the halls under the following conditions:</p> <ul style="list-style-type: none"> • Battery-powered smoke detectors must be installed in equipment rooms, control rooms and storage rooms. • Stands with closed ceilings of 200 to 1,000 m² must be equipped with smoke detectors, extra fire extinguishers, and be staffed with a security guard. • Additional restrictions apply to stands with closed ceilings of over 1,000 m²; please contact Technical Services for Exhibitors for more information. • Pursuant to the NVStättVO regulations, closed meeting rooms with a floor area of over 200 m² with a closed ceiling must have an approved smoke exhaust system, whereas sufficient vents for removal of smoke are permitted for floor areas up to 1,000 m². • For rooms > 200 m² with closed ceilings, ventilation equipment must be provided.
Fire prevention	<ul style="list-style-type: none"> • For two-storey stands, all load-bearing elements, the first floor ceiling, and the upper level floor must be constructed of materials that are nonflammable pursuant to the DIN 4102-1 B1 or EN 13501-1 C standards. Wooden stairways are permissible. • Each level of two-storey stands must be equipped with at least one fire extinguisher.
Glass and acrylic glass	<ul style="list-style-type: none"> • Only safety glass appropriate for the intended purpose may be used. • For glass constructions (in floors, balustrades, facades and ceilings), please request the information sheet "Use of glass and acrylic glass in stand construction and design inside fair halls" from the Technical Services for Exhibitors department at Deutsche Messe .

Structural calculation requirements for two-storey stands

Structural integrity calculations must be submitted together with the application for building permission. All calculations must be verified by a second (independent) structural engineer and must be prepared in German, in accordance with all standards applicable in Germany. The calculations must be specifically based on the building project submitted, and must include the following specifications and checks:

1. Specification of applied loads (static loads, live loads, horizontal loads).
2. Stress checks for individual structural components.
3. Check on the overall stability provided by frames/joints/plates including connections and anchorages.
4. Preparation of a complete layout plan showing the positions on which the structural integrity calculations are based, including all necessary design specifications (details on profiles and dimensions of the structural system)
5. Check on banisters and the upper storey balustrade spar forces including mounting fixtures.
6. Check on glass components which are subject to approval (see information on page 3 "Glass and...").
7. Check on maximum connection forces for standard connecting elements.
8. Details of the column cap/column base design including floor load - point loads.

Construction requirements for two-storey stands

1. Wooden floors on the upper storey

Chipboard (flat pressed particle board; DIN 68763) and laminated timber boards (construction plywood; DIN 68705, Part 3 and Part 5) are permitted for load-bearing wooden floor constructions. **Coreboards are not suitable for walking on.** If any different construction materials are to be used, a certificate of approval regarding their load-bearing capacity must be submitted.

Wooden floors consisting of individual sheets must – if required to **stiffen the structure laterally** – be laid such that the ends of each sheet are staggered in relation to the ends of the neighboring sheet, and each sheet must be firmly attached (by frictional means) to the underlying structure at regular intervals ($a \leq 50$ cm), including the outer edges of the floor. In cases where the structure's lateral stability cannot be ensured by these means, floor bracing members must be installed. This also applies in principle to roof covers made of trapezoidal metal sheeting.

2. Wooden stairways

In the case of wooden stairways also serving as an integral part of the supportive structure, a design drawing must be submitted. Proper attachment of railing supports must be ensured (see point 3).

3. Balustrades and stairway railings

The direct attachment of balustrade and railing supports to wooden floors/wooden steps is not permitted. If attachment to the steel construction is not possible, laminated timber boards (Multiplex) must be installed. The connecting bolts must penetrate through the latter and be secured using large washers.

4. Wind bracing

For wind bracing purposes, diagonal struts made of steel must be securely attached to the vertical supports by frictional means (bolted on tie bars have proved suitable for this purpose), and the vertical supports must extend in a straight line all the way to the ceiling supports. The vertical supports must be anchored to the hall floor by means of plugs, or interconnected by means of struts. Owing to the special nature of the hall floors, it is essential to use reaction anchors, which must be anchored in the reinforced concrete sole plate. The thickness of the floor above the sole plate varies from 6 cm to 18 cm, depending on the particular hall.

5. Corner supports / corner framework

Corner supports for which no verification of floor traction is included in the structural calculations must either be anchored to the hall floor or interconnected by means of tie members. This especially applies to external frame supports. Pretension must be applied as required in the structural calculations.

6. Support footings located over supply channels

If the placement of support footings on top of supply channels is unavoidable, the following must be observed:

- Supports exerting a load of $P < 40$ kN with base plates $\geq 300 \times 300$ mm may rest on channel covers.
 - Support loads of $P \geq 40$ kN must be sustained by reinforced steel plates or traverses welded on both sides.
- No loads may be exerted on the border profiles of the supply channels, nor may anything be attached to them.

7. It is imperative that all recommendations/specifications given in the verified structural calculations be implemented in practice.