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European Technical Assessment Body  
for construction products



## European Technical Assessment

ETA-15/0494  
of 16 July 2024

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

Cantilever step stair system Schön

Product family to which the construction product belongs

Prefabricated stair

Manufacturer

Joachim und Michael Schön GbR  
Im Neudorf 10-12  
56479 Seck

Manufacturing plant

Werk 1 - 50

This European Technical Assessment contains

14 pages including 3 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

EAD 340006-00-0506

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## Specific Part

### 1 Technical description of the product

The Cantilever step stair system Schön is a prefabricated stair system, which consists of steps and system fasteners.

The steps consist of a welded steel profile, which is fixed on the wall side by fasteners or wall ties in a concrete wall. Alternatively, the steel profile can be screwed or welded on steel columns or fixed to a wooden stud wall.

The product description is given in Annex A. The material values, dimensions and tolerances of the components of the stair not indicated in the annexes shall correspond to the values laid down in the technical documentation<sup>1</sup>.

### 2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the stair is used in compliance with the specifications and conditions given in Annex B.

The verification and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the stair of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

<sup>1</sup> The technical documentation comprises all information of the manufacturer necessary for the production, installation and maintenance of the stair; these are in particular the structural analysis, design drawings and the manufacturer's installation instructions. The part to be treated confidentially is deposited with Deutsches Institut für Bautechnik and, as far as this is relevant to the tasks of the approved bodies involved in the procedure of attestation of the AVCP-System, shall be handed over to the approved body.

### 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
Load-bearing capacity <ul style="list-style-type: none"> <li>- Load-bearing capacity of the stair</li> <li>- Load-bearing capacity of components of the stair</li> <li>- Load-bearing capacity of fixings</li> </ul>	$Q_{Rk}$ , $q_{Rk}$ and $h_{Rk}$ : See Annex C2 $H_{Rk}$ : No performance assessed $M_{Rk}$ , $V_{Rk}$ , $N_{Rk}$ , $E$ , $G$ , $f_{mk}$ und $f_{vk}$ : See technical documentation of this European Technical Assessment See technical documentation of this European Technical Assessment
Load-Displacement behaviour	$w_Q$ : See Annex C2
Vibration behaviour <ul style="list-style-type: none"> <li>- concrete wall and steel columns</li> <li>- wooden stud wall</li> </ul>	First natural frequency: $f_1 \geq 5$ Hz Deflection under a single load $F = 1$ kN: $w_{Q1} \leq 5$ mm First natural frequency: No performance assessed Deflection under a single load $F = 1$ kN: $w_{Q1} \leq 5$ mm
Prevention of progressive collapse	Failure of individual components of the stair does not lead to a progressive collapse of the complete stair
Residual load-bearing capacity	Local material failure does not lead to an abrupt total loss of load-bearing capacity of the stair
Long-term behaviour	Load-bearing capacity are ensured under an appropriate use and maintenance over the indicated working life
Resistance to earthquakes	No performance assessed
Durability against physical, chemical, biological agents	Adequate durability for the intended use under an appropriate use and maintenance

#### 3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	See Annex A5
Fire resistance	No performance assessed

#### 3.3 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Release of formaldehyde	Class E1 for stairs with joint to wood stud wall
Release of pentachlorophenol	No pentachlorophenol treated materials are used
Radioactive emission	No performance assessed

### 3.4 Safety in use (BWR 4)

Essential characteristic	Performance
Geometry	See Annex C1
Slipperiness	No performance assessed
Equipment of the stair for a safe use	No performance assessed
Safe breakage of components	No brittle failure of stair components
Impact resistance	No performance assessed

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

In accordance with the European Assessment Document EAD No. 340006-00-0506 the applicable European legal act is: 1999/89/EC

The System to be applied is: 2+

In addition, with regard to reaction to fire for products covered by the European Assessment Document EAD No. 340006-00-0506 the applicable European legal act is: 2001/596/EC

The System to be applied is: 4

### 5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

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

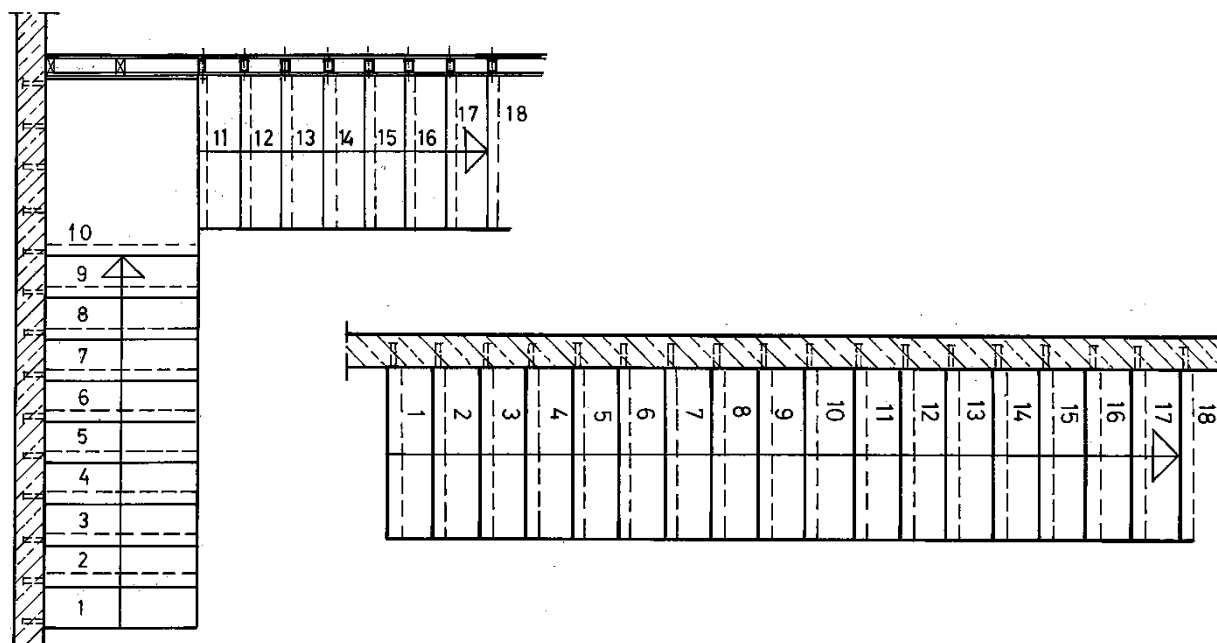
Issued in Berlin on 16 July 2024 by Deutsches Institut für Bautechnik

LBD Dipl.-Ing. Andreas Kummerow  
Head of Department

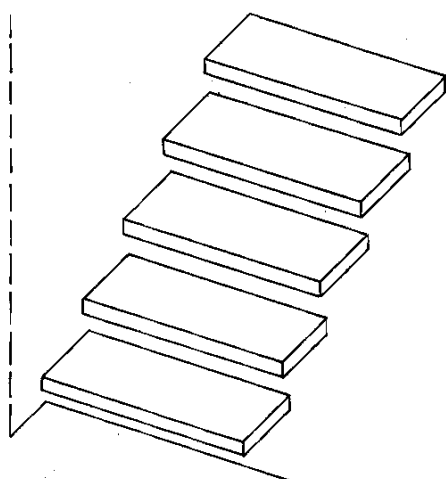
*beglaubigt:*  
Stiller

### Type of plan

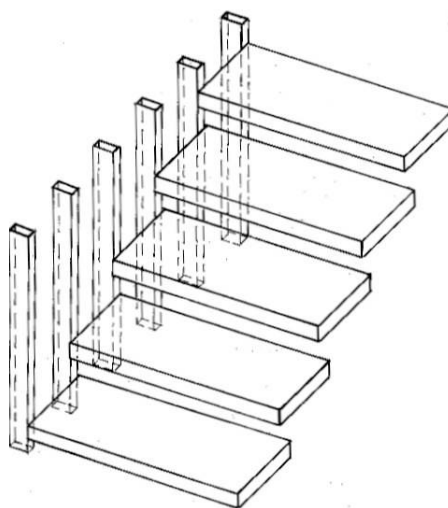
Walking line is exemplified, position may be chosen freely within the walking zone, walking zone is 20 % of the clear width of the stair in the middle of the stair



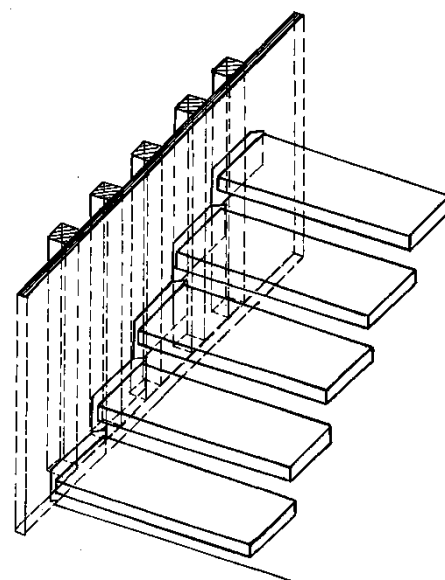
### Types of construction



Type 1  
Concrete wall



Type 2  
Steel columns



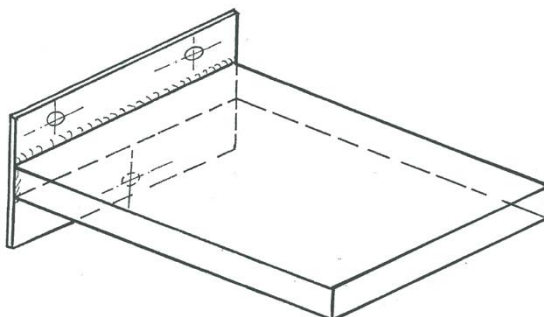
Type 3  
Wooden stud wall  
with multiplex plate

### Cantilever step stair system Schön

Product  
(Types of plans and construction)

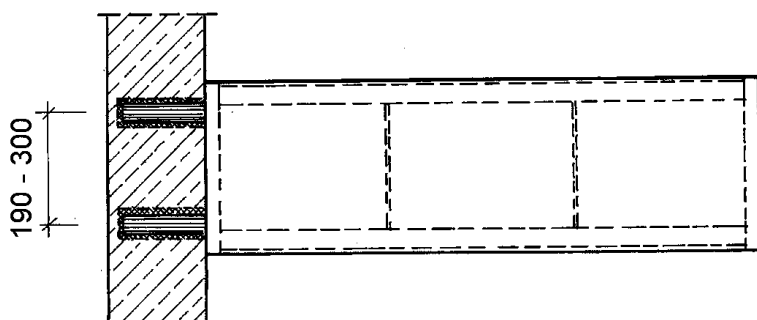
**Annex A1**

**Anchor joint to concrete wall ( $\geq C20/25$ )**  
(Type 1 according to Annex A1)

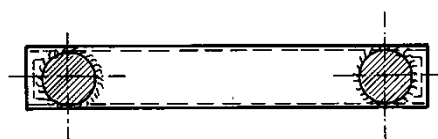


**Bold joint to concrete wall ( $\geq C20/25$ )**  
Type 1 according to Annex A1

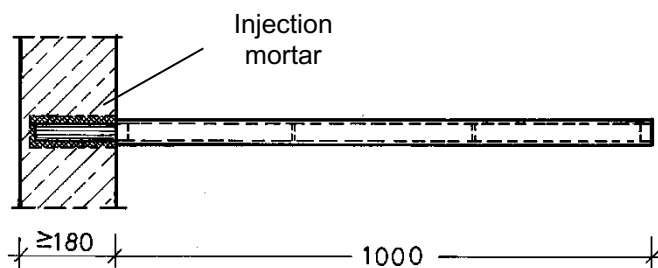
Plan



Section



View



Dimensions in mm, more details (geometry, joints etc.) according to technical documentation

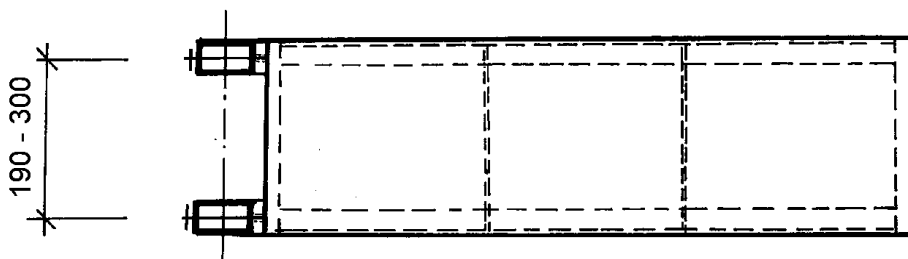
**Cantilever step stair system Schön**

Step and joint to concrete wall

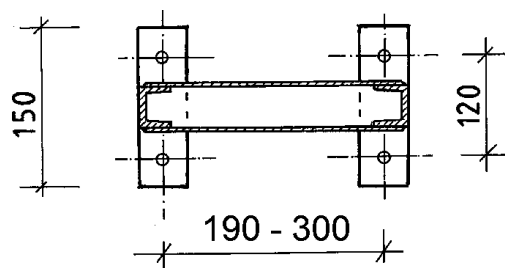
**Annex A2**

**Joint to steel columns**  
(Type 2 according to Annex A1)

Plan

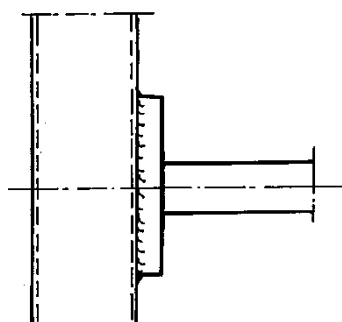


Section

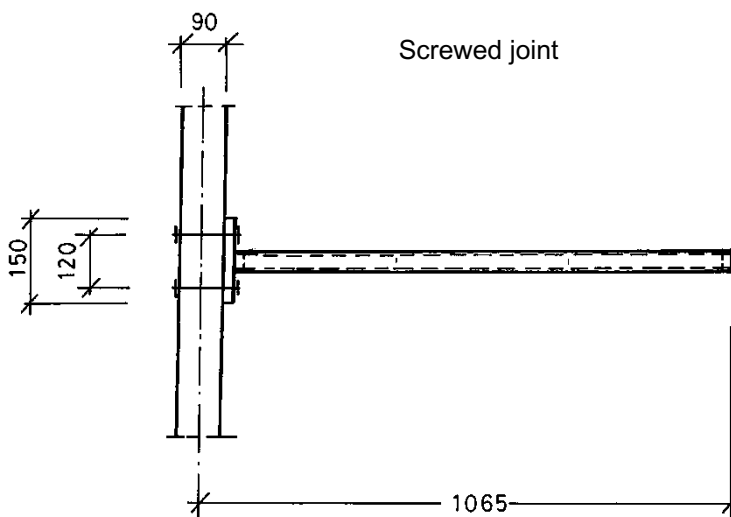


View

Welded joint



Screwed joint



Dimensions in mm, more details (geometry, joints etc.) according to technical documentation

**Cantilever step stair system Schön**

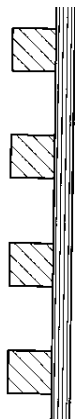
Steps and joint to steel columns

**Annex A3**

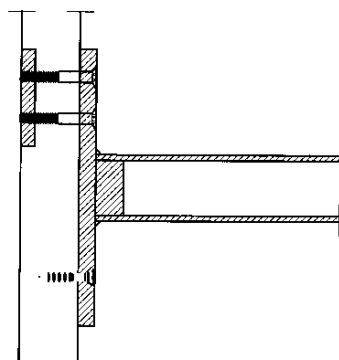


**Joint to wooden stud wall**  
(Type 3 according to Annex A1)

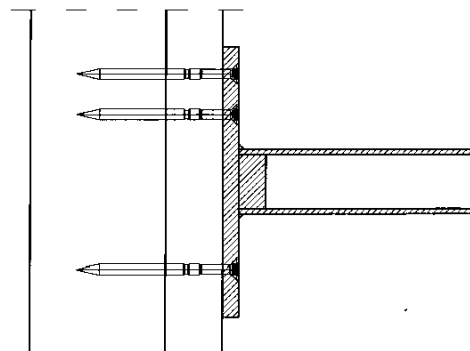
Wall section



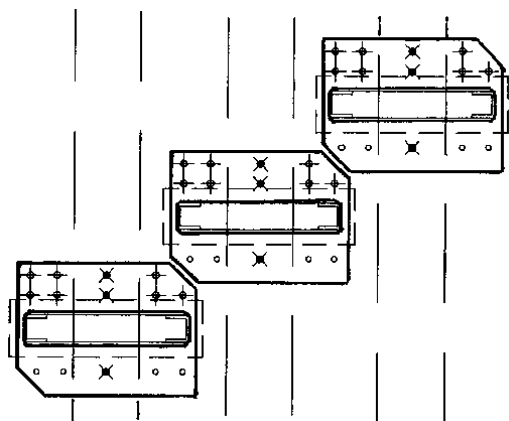
Screw connection to multiplex panels



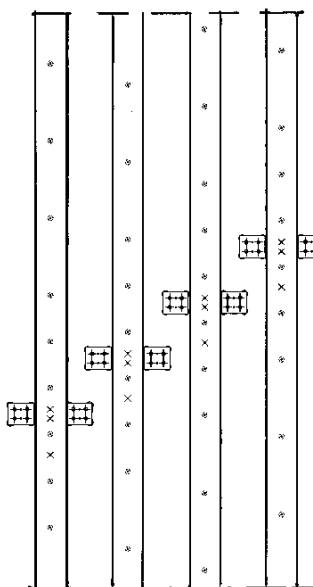
Screw connection to post



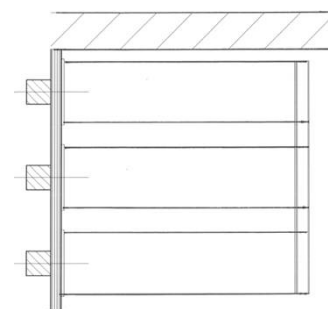
View from the inside



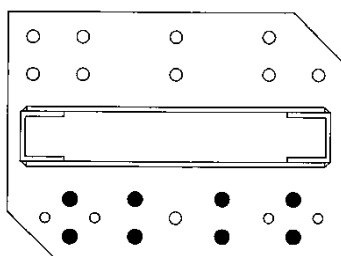
View from the backside



Landing



Anchor plate



More details (geometry, joints, wall construction etc.) according to technical documentation

**Cantilever step stair system Schön**

Steps and joint to wooden stud wall

**Annex A4**

**Table 1: Minimum dimensions and materials of relevant stair components**

Component of stair		Minimum dimensions			Material	Reaction to fire
Step (box section) <sup>3)</sup>	Concrete wall and steel columns	Height / Width	[mm]	46 / 320 48 / 250	Steel S235	A1
	Wooden stud wall	Height / Width	[mm]	48 / 250	Steel S235	A1
Steel Column <sup>2)</sup>		Rectangle section Height / Width / Thickness	[mm]	90 / 50 / 4	Steel S235	A1
Wooden stud wall	Posts	Height / Width	[mm]	100 / 100	Wood C24	D-s2, d0
	Plates	Thickness	[mm]	42	Wood based product <sup>1) 4)</sup>	D-s2, d0
Fasteners for joint to concrete wall		Diameter	[mm]	12	Steel <sup>1)</sup>	A1

1) characteristic values of material according to technical documentation

2) maximum length: 3.00 m; Fixed at bottom and hinged support at the top; maximum distance between columns: 260 mm

3) wood covering and covering of natural stone with maximum dead load according to technical documentation is possible

4) multiplex plate, layer structure according to technical documentation

**Cantilever step stair system Schön**

Minimum dimensions of relevant stair components and reaction fire

**Annex A5**

## Specification of intended use (Part 1)

### Intended use:

- European Technical Assessment applies for a construction system.
- For the specific case of use the corresponding type of stair is manufactured within the context of the values defined in the European Technical Assessment.
- Values of this ETA apply to all types of stairs; the real dimensions follow in accordance with the relevant case of use.

### Stair subject to:

- Static or quasi-static loads

### Use conditions:

- Indoor stair
- Air temperatures between +5 °C and +30 °C
- Relative air humidity between 30 % and 70 %
- To the individual requirements handrail and barrier may be attached to the stair optionally. Conditions for possible barrier/handrail:

Types of construction 1 and 2 according to Annex A1:

Dead load  $\leq 0,50$  kN/m

Height (load application point)  $\leq 1,00$  m

Distance of railing posts  $\leq 0,9$  m

Type of construction 3 according to Annex A1:

Dead load  $\leq 1,00$  kN/m

Height (load application point)  $\leq 1,00$  m

Distance of railing posts  $\leq 0,9$  m

### Design:

- Design of the stair according to the annexes and the technical documentation to this European Technical Assessment
- Fastening of the stair to the construction works according to the annexes and the technical documentation to this European Technical Assessment
- Verification of the transmission of loads to the construction works by the civil engineer responsible for the construction works
- Load-bearing capacity at ultimate limit state:

$$q_k \cdot \gamma_Q \leq q_{Rk} / \gamma_M$$

$$Q_k \cdot \gamma_Q \leq Q_{Rk} / \gamma_M$$

$$h_k \cdot \gamma_Q \cdot \psi_0 \leq h_{Rk} / \gamma_M$$

with

$q_{Rk}, Q_{Rk}, h_{Rk}$ : characteristic values of resistance; see Table 3

$\gamma_M$ : recommended material partial safety factor; see Table 3

$q_k, Q_k, h_k$ : characteristic values of imposed loads according to EN 1991-1-1:2002 + AC:2009

$\gamma_Q = 1,5$ : recommended partial safety factor, in absence of other national regulations

$\psi_0 = 0,7$ : recommended combination factor, in absence of other national regulations

- Maximum characteristic values of imposed loads under consideration off the partial factors mentioned above; see Table 5

## Cantilever step stair system Schön

Specification of intended use (Part 1)

Annex B1

## Specification of intended use (Part 2)

### Installation:

- Installation by personnel appropriately trained and authorized by the manufacturer by means of the technical documentation of this European Technical Assessment
- Installation only in the way as specified in the technical documentation of this European Technical Assessment
- Sufficient support of the stair when assembling
- Installation of stair components without imposed deformations

### Indications to the manufacturer:

- Ensure that all persons involved will be appropriately informed about the specific conditions according to sections 1 and 2 (including the annexes to which reference is being made as well as the not confidential parts of the technical documentation deposited to this European Technical Assessment)
- Instructions for use should provide information as to use, maintenance and repair of the stair

**Cantilever step stair system Schön**

Specification of intended use (Part 2)

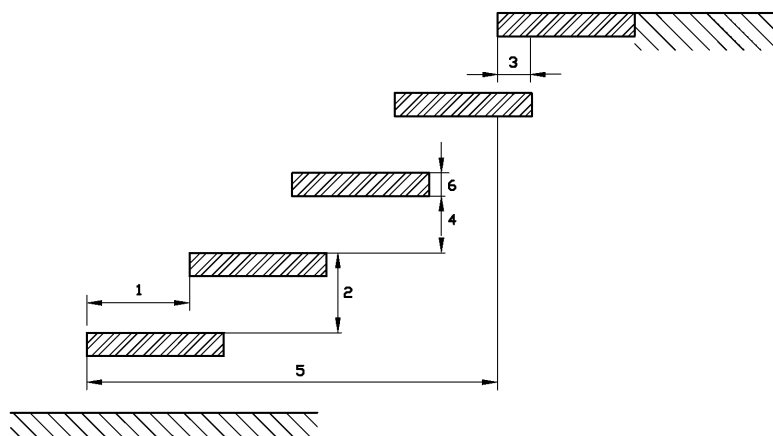
**Annex B2**

**Table 2: Geometry**

Designation		Dimension	
		minimum	maximum
Going on walking line <sup>1)</sup>	[mm]	210	320 <sup>2)</sup>
Rise of the stairs <sup>1)</sup>	[mm]	140 <sup>2)</sup>	210
Pitch of the walking line <sup>1)</sup>	[°]	21	45
Overlap of the steps	[mm]	30	- <sup>3)</sup>
Number of rises	[-]	3	18
Openings	Between stairs and wall	[mm]	0
	Between consecutive steps	[mm]	- <sup>3)</sup> 164
Clear width of stairs	for stairs with joint to concrete walls or steel columns	[mm]	500 1000
	for stairs with joint to wooden stud wall	[mm]	500 1030
Length of the flight	[mm]	- <sup>3)</sup>	
Thickness of steps	[mm]	46	- <sup>3)</sup>

- 1) Values are constant within one flight
- 2) Tolerance between nominal value and actual value = ± 5 mm
- 3) Not relevant

- 1 **Going**
- 2 **Rise**
- 3 **Overlap**
- 4 **Opening between consecutive steps**
- 5 **Length of the flight**
- 6 **Thickness of steps**



**Cantilever step stair system Schön**

Geometry of the stair

**Annex C1**

**Table 3: Load-bearing capacity - Characteristic values of resistance**

Type of loading	Characteristic values of resistance			$\gamma_M$ <sup>1)</sup>
Vertical variable uniformly distributed load	$q_{Rk}$	[kN/m <sup>2</sup> ]	5,63	1,25
Vertical variable single load	$Q_{Rk}$	[kN]	3,75	
Horizontal variable uniformly distributed load on barrier	$h_{Rk}$	[kN/m]	0,66	

1) Recommended partial safety factor, in absence of other national regulations

**Table 4: Deflections under loading**

Deflection of the step under single point load			
Single load	$Q_k$	[kN]	2,0
Clear width of the stair	L	[mm]	1000
Deflection related to the clear width of the stair	$w_Q$	[mm]	$\leq L/150$

**Table 5: Imposed loads**

Type of loading	Imposed loads		
Vertical variable uniformly distributed load	$q_k$	[kN/m <sup>2</sup> ]	3,0
Vertical variable single load	$Q_k$	[kN]	2,0
Horizontal variable uniformly distributed load on barrier	$h_k$	[kN/m]	0,5

**Cantilever step stair system Schön**

Load-bearing capacity - Characteristic values of resistance,  
Deflections under loading,  
Imposed loads

**Annex C2**