Deutsches Institut für Bautechnik

Public-law institution jointly founded by the federal states and the Federation

European Technical Assessment Body for construction products

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

European Technical Assessment

ETA-17/0685 of 10 June 2025

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	Eurostair spiral stair
Product family to which the construction product belongs	Prefabricated stair kits
Manufacturer	Eurostair Produktion AB Säterivägen 30 66130 Säffle SCHWEDEN
Manufacturing plant	Eurostair Production AB, Säffle, Sweden
This European Technical Assessment contains	16 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 *Eurostair spiral stair* is a prefabricated system made of steel components, assembled on site to form a complete spiral staircase. The stair consists of a centre tube onto which the steps are mounted in a spiral configuration. Railing posts are attached to the outer edge of each step and support the handrail, forming a protective barrier. Two types of barriers are available: the industrial version and the child-safe version. Both are 1100 mm high, with the child-safe version incorporating infill elements to ensure no opening exceeds 100 mm.

A platform is mounted to the centre tube, with railing posts and handrail continuing around the platform edge. The centre tube, steps, and railing together form the load-bearing structure of the stair. All components are made of steel. The stair is available in radii ranging from 800 mm to 1200 mm. The standard platform size is the stair radius plus 50 mm. The direction of rotation – clockwise or anticlockwise – is determined according to the specific installation.

The base of the centre tube and the start of the railing must be fixed to a suitable floor. Support brackets and platform elements must be secured to the wall or the upper floor deck.

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[1].

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 25 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.

[1] The technical documentation includes all information provided by the manufacturer that is necessary for the production, installation and maintenance of the stair. This primarily comprise the structural analysis, construction drawings, and the manufacturer's installation instructions. The confidential part of this documentation is stored at the Deutsches Institut für Bautechnik. If this confidential section is relevant to the tasks of the approved bodies within the framework of the AVCP system certification process, it will also be provided to those bodies.

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 - Load-bearing capacity of the stair - Load-bearing capacity of components of the stair - Load-bearing capacity of fixings	 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 The fixing to the supporting structure is not part of this European Technical Assessment.
Load-Displacement behaviour	w_Q: See Annex C2
Vibration behaviour - First natural frequency f_1 - Deflection under a single load of F = 1 kN	 No performance assessed $w_{Q1} \leq 5$ 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	A1
Fire resistance	No performance assessed

3.3 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Release of formaldehyde	No formaldehyde treated materials are used
Release of pentachlorophenol	No pentachlorophenol treated materials are used
Radioactive emission	No radioactive emission

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	Handrail and barrier (see Annex A4 and A5). If vertical balusters, arranged between step and handrail, are used as fill-in elements, climb ability for infants will not be supported. Tactility and visibility: No performance assessed
Safe breakage of components	No brittle failure of individual stair components made of steel
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.

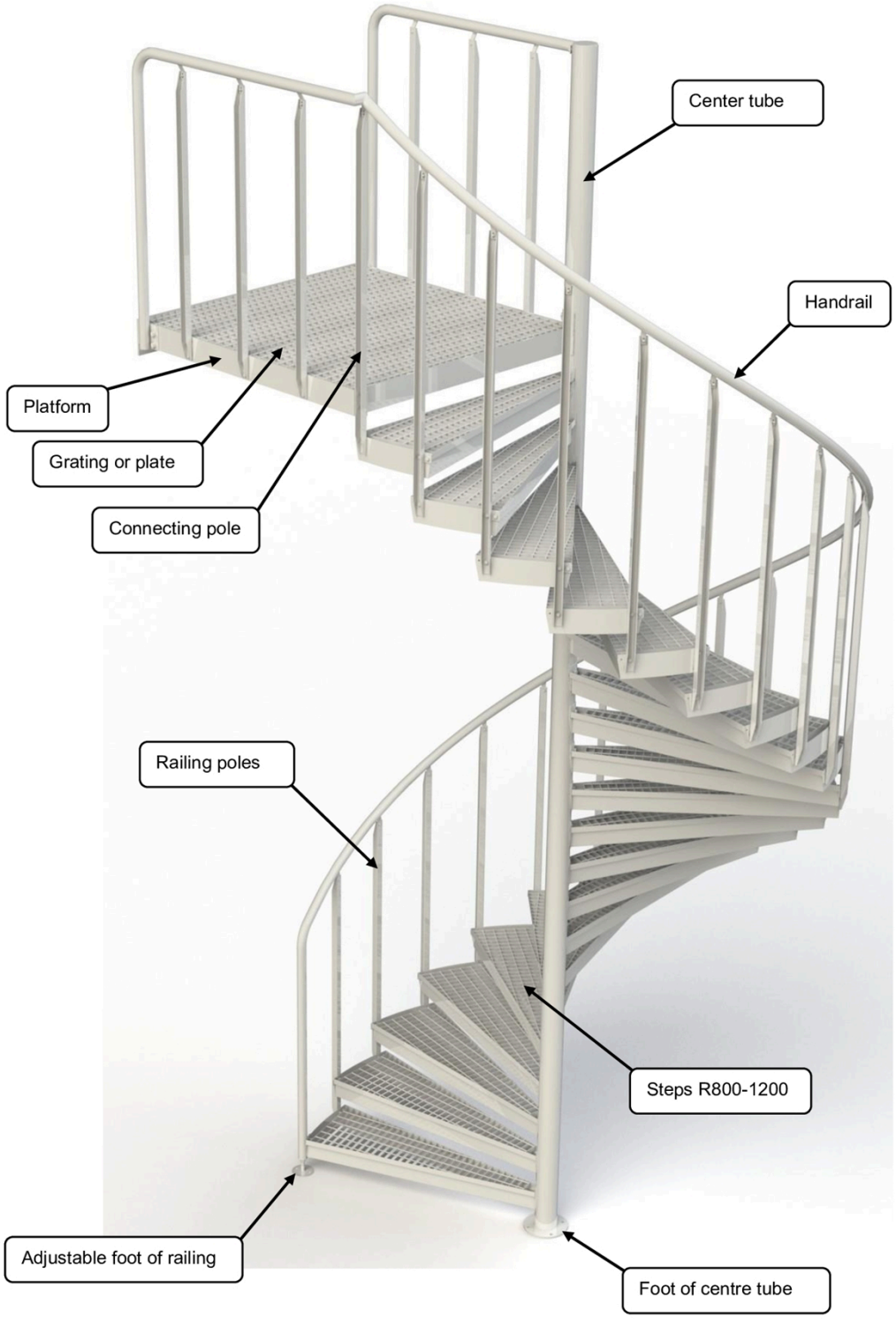
Issued in Berlin on 10 June 2025 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock
Head of Section

beglaubigt:
Stiller

Deutsches Institut für Bautechnik DIBt

3D-View of Stair



Eurostair spiral stair	**Annex A1**
Product	

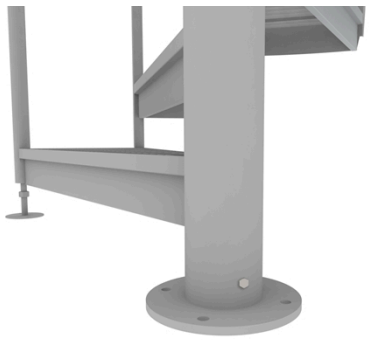


Fig. 1) Foot of center tube and foot of railing

Fig. 2) Joint between step and railing poles

Fig. 3) Step joints to center tube and railing poles

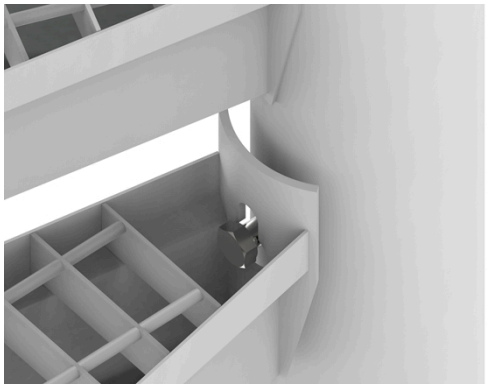


Fig. 4) Step bolted to center tube

Fig. 5) Railing poles joint to handrail

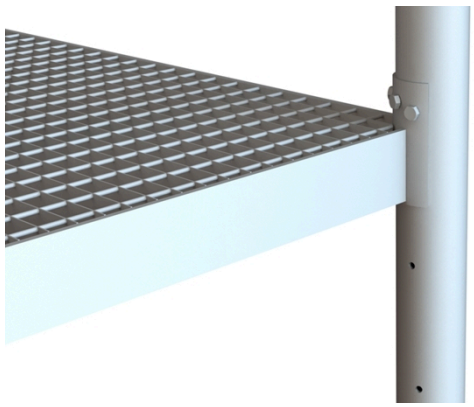


Fig. 6) Platform bolted to center tube

Eurostair spiral stair	**Annex A2**
Joints of stair components (Part 1)	

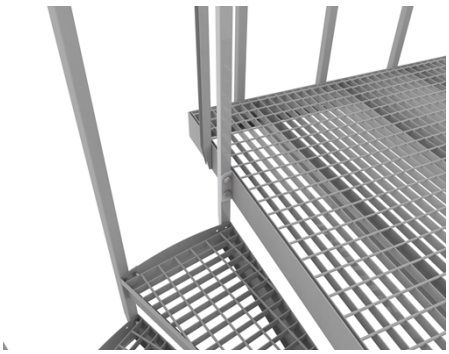


Fig. 7) Joint between step, railing pole and platform

Fig. 8) Handrail joint

Fig. 9) Railing poles bolted to platform

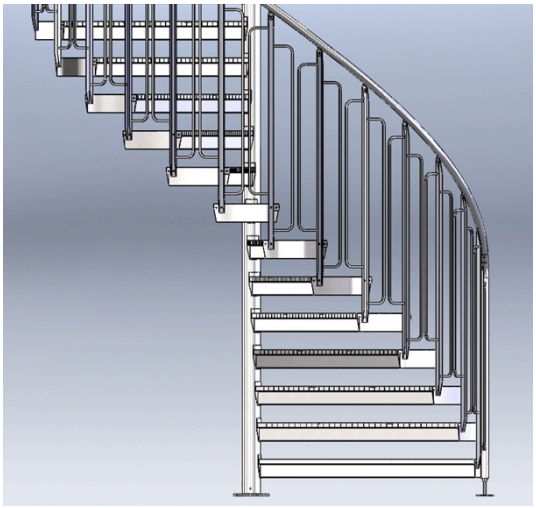


Fig. 10) Child safe barrier, max opening 100 mm

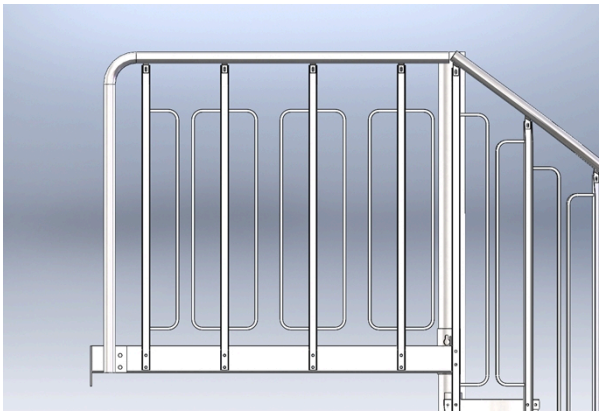


Fig. 11) Child safe barrier on platform

Eurostair spiral stair	**Annex A3**
Joints of stair components (Part 2)	

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Table 1: Minimum dimension of relevant stair components

Component	Material	Dimension		Value
Step	Steel	Height	[mm]	100
Centre tube		Outside diameter x wall thickness	[mm]	100 x 5
Railing pole		U-section: height x width x web thickness	[mm]	30 x 32 x 3
Handrail		Outside diameter x wall thickness	[mm]	42,4 x 2,6
Step covering: Plate		Thickness	[mm]	4
Step covering: Grating		Grating (bearing bar): height x thickness	[mm]	25 x 2
		Mesh size: distance between bearing bars x distance between cross bars	[mm]	34,3 x 50,8

Eurostair spiral stair	**Annex A4**
Minimum dimension of relevant stair components	

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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 this 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 and quasi static loads

Use conditions:

- Indoor stair
- Air temperatures between +5 °C and +30 °C
- Relative air humidity between 30% and 70%

Design:

- Design of the stair according to the annexes and the technical documentation of this European Technical Assessment.
- Fastening of the stair to the construction works are not part of this Technical European Assessment.
- Verification of the fastenings and the transmission of loads to the construction works by the civil engineer responsible for the construction works.
- Load bearing capacity at ultimate limit state:

$$q_k \cdot \gamma_Q \leq q_{Rk} / \gamma_M$$
$$Q_k \cdot \gamma_Q \leq Q_{Rk} / \gamma_M$$
$$h_k \cdot \gamma_Q \leq h_{Rk} / \gamma_M$$

with

q_{Rk}, Q_{Rk}, h_{Rk}: characteristic values of resistance; see Table 4

γ_M: recommended material partial safety factor; see Table 4

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

- Maximum characteristic values of imposed loads under consideration of the partial factors mentioned above; see Table 6

Eurostair spiral stair	**Annex B1**
Specification of intended use (Part 1)	

Specification of intended use (Part 2)

Installation:

- Assembly of the spiral staircase must be done according to Eurostair assembly instruction and with qualified personal from the construction company. The construction company need to make sure that assembly is done correctly and that connection to the building is done with sufficient stability to cope with the reacting forces from the stair.
- 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
- Installation of stair components without significant defects and cracks
- Bolted connections are protected such that they will not be loosened by vibrations

Indication of 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.

Eurostair spiral stair	**Annex B2**
Specification of intended use (Part 2)	

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Table 3: Geometry

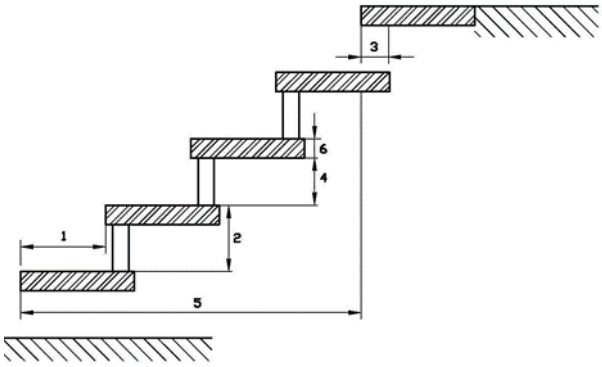
Designation		Dimension	
		Minimum	Maximum
Radius of stair	[cm]	800	1200
Going [1)]	[mm]	60	360 [2)]
Rise of the stairs [1)]	[mm]	165 [2)]	220
Pitch of the walking line [1)]	[°]	29	49
Overlap of the steps	[mm]	8	75
Number of rises	[-]	2	38
Openings between consecutive steps	[mm]	65 [3)]	120
Clear width of stairs	[mm]	708	1108
Floor to floor height	[mm]	- [3)]	6400
Minimum head room	[mm]	2000	- [3)]

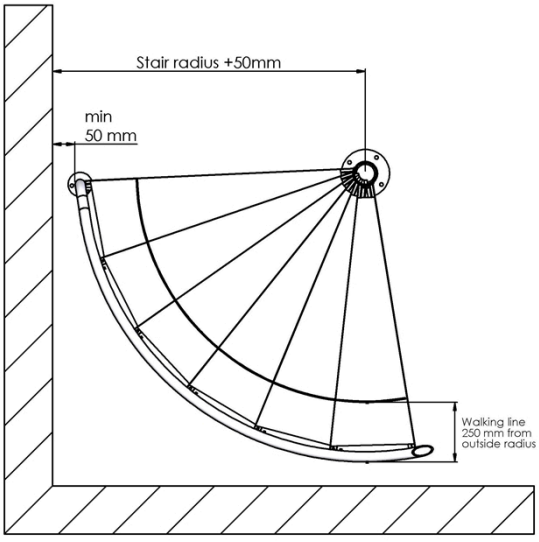
1) Values are constant within one flight

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





Notes:

Walking line may be chosen freely within the walking zone; walking zone is 20 % of the clear width of the stair. The Center of walking zone is located 250 mm from outside railing.

Eurostair spiral stair	**Annex C1**
Geometry of stair	

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Table 4: Load-bearing capacity - Characteristic values of resistance

Type of loading	Characteristic values of resistance			γ_M [1)]
vertical variable uniformly distributed load	q_{Rk}	[kN/m²]	5,5	1,1
vertical variable single load	Q_{Rk}	[kN]	3,3	
horizontal variable uniformly distributed load on barrier	h_{Rk}	[kN/m]	1,1	

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

Table 5: Deflections under loading

Deflection of the step under single point load			
Single load [1)]	Q_k	[kN]	3,0
Clear width of the stair (maximum)	L	[mm]	1108
Deflection related to the clear width of the stair	w_Q	[mm]	≤ L/94
Single load [1)]	Q_k	[kN]	2,1 [2)]
Clear width of the stair (maximum)	L	[mm]	1108
Deflection related to the clear width of the stair	w_Q	[mm]	≤ L/132

1) Proven for a surface area of 15 x 15 cm

2) For the frequent combination with 0,7 x Q_k = 2,1 kN

Table 6: Imposed loads

Type of loading	Imposed loads		
vertical variable uniformly distributed load	q_k	[kN/m²]	5,0
vertical variable single load	Q_k	[kN]	3,0
horizontal variable uniformly distributed load on barrier	h_k	[kN/m]	1,0

Eurostair spiral stair

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

Annex C2

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Table 7: Design loads on supports

Force [kN]		F_x	F_y	F_z
Support point (According to Annex C4)	**P1**	4,0	4,0	See Table 8
	P2	0	0	6,0
	P3	5,1	+ / - 8,0	5,3
	P4	0	+ 5,0	0
	P5	0	-5,0	5,0
	P6	4,0	+ / - 7,7	0

Table 8: Design load Fz for Support point P1 (footing) per floor in [kN]

Radius of stair [cm]		1200	1100	1000	900	800
Floor height [m]	**6,4**	57	50	44	38	33
	4,0	36	31	27	23	20
	3,6	35	30	27	23	20
	3,2	34	30	26	23	20

Table 9: Maximum number of floors [1)]

Radius of stair [cm]		1200	1100	1000	900	800
Floor height [m]	**6,4**	1	1	1	1	1
	4,0	3	4	5	6	8 (7)
	3,6	4	5	6	8	10 (9)
	3,2	5	7 (6)	8	10	12
	4,0 [2)]	12 (11)	14	17 (16)	20 (19)	23 (22)

1) Value in brackets for stairs with steel plates as step covering

2) Additional bracing every 2,25 m height

Eurostair spiral stair	**Annex C3**
Design loads for transmissions of loads into the structure and for the design of fastenings	

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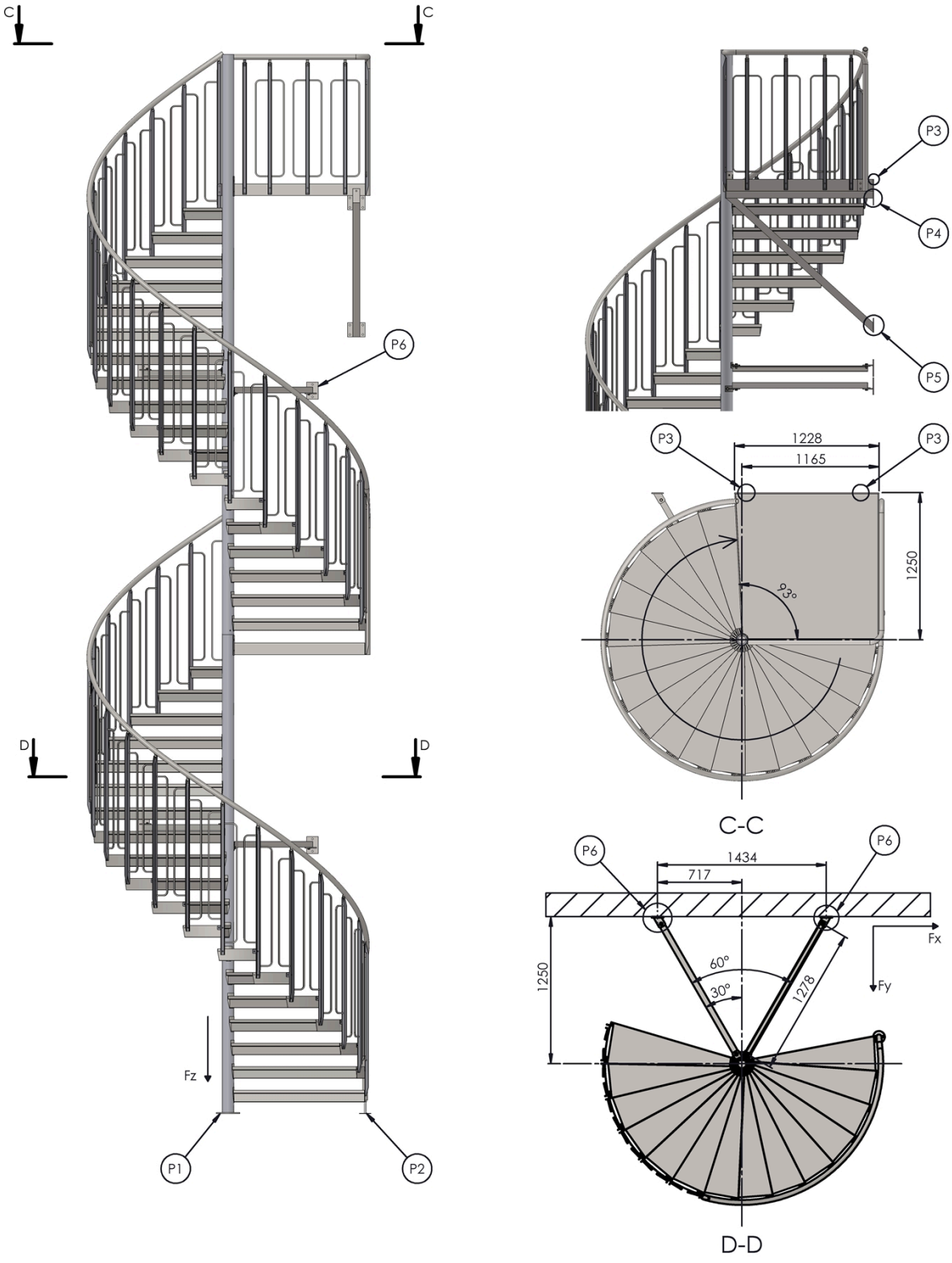
Support points for stairs without straight exit



Eurostair spiral stair	**Annex C4**
Support points without straight exit	

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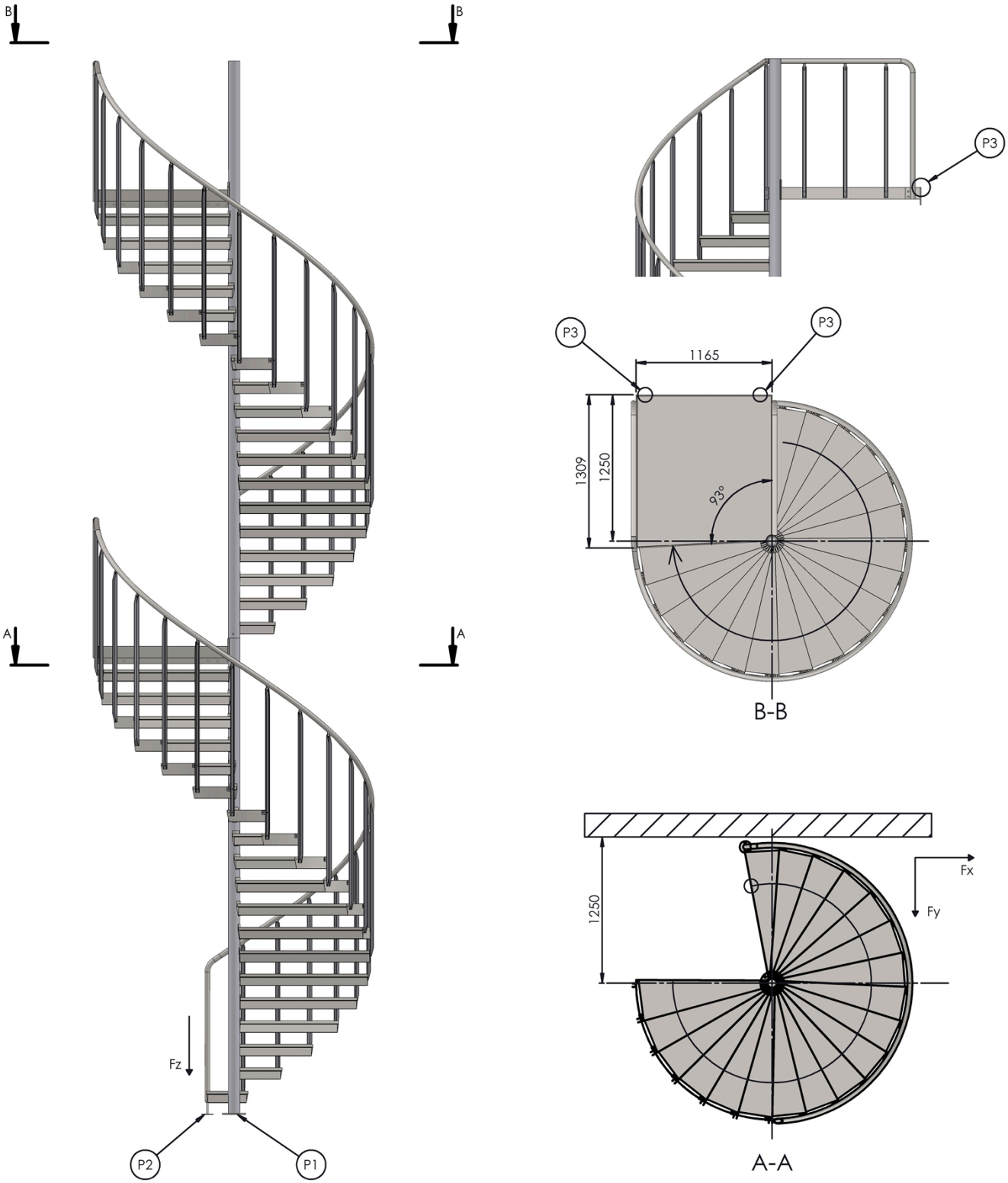
Support points for stairs with straight exit



Eurostair spiral stair	**Annex C5**
Support points with straight exit	