Deutsches Institut für Bautechnik

Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

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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-20/0601 of 5 October 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 | Fall Protection System LUX-top® AP for concrete structures |
| Product family to which the construction product belongs | Anchor Devices for Fastening Personal Fall Protection Systems to Concrete Structures |
| Manufacturer | ST QUADRAT Fall Protection S.A.<br>45, rue Fuert<br>L-5410 BEYREN<br>LUXEMBURG |
| Manufacturing plant | ST QUADRAT Fall Protection S.A.<br>45, rue Fuert<br>L-5410 Beyren |
| This European Technical Assessment contains | 16 pages including 12 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 | 331072-00-0601 |
| This version replaces | ETA-20/0601 issued on 14 October 2020 |

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## Specific part

### 1 Technical description of the product

The subject of this assessment are anchor points for protecting persons (operators) working at heights against a fall. The fall protection systems are made of stainless steel 1.4301 / 1.4307. It is fastened to reinforced normal concrete (cracked or uncracked), strength classes C20/25 to C50/60 and pre-stressed concrete with at least the strength class C45/55 according to EN 206. The fall protection systems are fastened to the concrete with the different fasteners which can be seen in the annexes.

This ETA includes the products listed in the following Table 1:

**Table 1: Products of this ETA**

| Annex No. | Trade Name (Product of this ETA) | Fastener |
|---|---|---|
| **2** | LUX-top® AP2s-18 | see Annex 1.3, Table 1 |
| **3** | LUX-top® AP2-18 (reduced anchorage depth) | FAZ II 10 /20 K R |
| **4** | LUX-top® AP2-18 | see Annex 1.3, Table 2 |
| **5** | LUX-top® AP2-26 | see Annex 1.3, Table 2 |
| **6** | LUX-top® AP10 II | FHY M10 R / FHY M10 A4 alternatively MKT Easy M10 A4 |
| **7** | LUX-top® AP10 III | FHY M10 R / FHY M10 A4 alternatively MKT Easy M10 A4 |
| **8** | LUX-top® AP2s-90° | see Annex 1.4, Table 3 |
| **9** | LUX-top® RGD | see Annex 1.4, Table 4 |

The components and the system setup of the product are given in Annexes.

### 2 Specification of the intended use in accordance with the applicable EAD 33-1072-00-0601

The fall protection systems listed in Table 1 is used to protect operators working at height (max. 3 persons), by arresting them in a fall. The operators attach themselves to the eye using e.g. ropes and karabiners. In the case of a fall the fall protection systems listed in Table prevent the fall and resulting physical damage assuming the correct usage by the operator. The fall protection systems listed in Table are designed for use in all areas of industry, construction and maintenance.

The intended use of the fall protection systems listed in Table 1 is the attachment to flat roofs or other flat surfaces (e.g. concrete walls) made of concrete. The force applied should usually be perpendicular (90 ° ± 5 %) to the fastener. Another load direction is possible if this is specified in the annexes intended only when the direction of force still applies at a 90° angle to the fastening axis.

The performances given in Section 3 are only valid if the of the products listed in Table 1 are used in compliance with the specifications and conditions given in Annexes 1 - 9.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the products listed in Table 1 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.

## 3 Performance of the product and references to the methods used for its assessment

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

| Essential characteristic | Performance |
|---|---|
| Reaction to fire | Class A1 |

### 3.2 Safety and accessibility in use (BWR 4)

| Essential characteristic | Performance |
|---|---|
| Static loading | Annexes 1-9 |
| Dynamic loading | Annexes 1-9 |
| Check of deformation capacity in case of constraining forces | Annexes 1-9 |
| Durability | No performance assessed |

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

In accordance with EAD No. 331072-01-0601, the applicable European legal act is: Decision (EU) 2018/771.

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 with Deutsches Institut für Bautechnik.

Issued in Berlin on 5 October 2023 by Deutsches Institut für Bautechnik

BD Dr.-Ing. Ronald Schwuchow
Head of Section

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Hahn

This ETA includes the products listed in Table 1:

## Table 1: Products included in this ETA

| Annex | Tradename (Product of this ETA) | Fastener | Supporting structure |
|---|---|---|---|
| 2 | LUX-top® AP2s-18 | see annex 1.3 table 1 | reinforced concrete C20/25 to C50/60[a] (cracked or uncracked) |
| 3 | LUX-top® AP2-18 (reduced anchorage depth) | bolt anchor FAZ II 10/20 K R[b] | reinforced concrete C20/25 to C50/60[a] (cracked or uncracked) |
| 4 | LUX-top® AP2-18 | see annex 1.3 table 2 | reinforced concrete C20/25 to C50/60[a] (cracked or uncracked) |
| 5 | LUX-top® AP2-26 | see annex 1.3 table 2 | reinforced concrete C20/25 to C50/60[a] (cracked or uncracked) |
| 6 | LUX-top® AP10 II | FHY M10 R / FHY M10 A4[c] alternative MKT Easy M10 A4 | Prestressed concrete hollow core slab min. C45/55[a] |
| 7 | LUX-top® AP10 III | FHY M10 R / FHY M10 A4[c] alternative MKT Easy M10 A4 | Prestressed concrete hollow core slab min. C45/55[a] |
| 8 | LUX-top® AP2s-90° | see annex 1.4 table 3 | Reinforced normal concrete C20/25 to C50/60[a] (cracked and non-cracked) |
| 9 | LUX-top® RGD | see annex 1.4 table 4 | Reinforced normal concrete C20/25 to C50/60[a] (cracked and non-cracked) |

Annexes 2 to 9 show the components and the system structure of the products.

All components of the anchor device can be used in weathered outdoor areas.

[a] EN 206:2013+A1:2016 Concrete: specification, properties, production and conformity
[b] ETA-05/0069 fischer Bolt Anchor FAZ II
[c] ETA-21/0857 fischer hollow ceiling anchor FHY

| | |
|---|---|
| Fall protection systems for anchoring in concrete substrates | Annex 1.1 |
| Overview and design values | |

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## Design values of actions

$F_{Ed} = F_{Ek} * \gamma_F$

The recommended partial factor $\gamma_F$ is 1,5.
The recommended partial factor is used in order to determine the corresponding design actions, provided no partial factor is given in national regulations or national Annexes to Eurocode 0. That leads to the following values:

Example:

For one user: $F_{Ed} = F_{Ek} * \gamma_F = 6\ kN * 1,5 = 9\ kN$
For two Users: $F_{Ed} = F_{Ek} * \gamma_F = (6 + 1)\ kN * 1,5 = 10,5\ kN$
For three Users: $F_{Ed} = F_{Ek} * \gamma_F = (6 + 2)\ kN * 1,5 = 12\ kN$

## Static loading / design resistance

$F_{Rd} = F_{Rk} / \gamma_M$

The recommended partial factor $\gamma_M$ is 1,5, provided no partial factor is given in national regulations or national Annexes to Eurocode 2.

## Dynamic loading / design resistance

See max. number of users on following annexes.

## Deformation capacity

See deformation at 0,70 kN on following annexes.

| | |
|---|---|
| Fall protection systems for anchoring in concrete substrates | Annex 1.2 |
| Overview and design values | |

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Table 1

| Anchor | | FAZ II 12/20 R[a] | | | BZ3 M12x 115/20 A4[b] | | | BZ 12-10-30/105 A4[c] | W-FAZ M12 A4[d] | HST2-R M12x105/10[e] | BSZ-SU 10x100 A4[f] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Manufacturer | | Fischer | | | MKT | | | MKT | Würth | Hilti | MKT |
| Drilling diameter $d_0$ [mm] | | 12 | | | 12 | | | 12 | 12 | 12 | 10 |
| Drilling depth $h_1$ [mm] | | 90 | | | 90 | | | 90 | 90 | 90 | 105 |
| Effective anchorage depth $h_{ef}$ [mm] | | 70 | | | 70 | | | 70 | 70 | 70 | 75 |
| min. Concrete thickness $h_{min}$ [mm] | | 120 | | | 120 | | | 140 | 140 | 140 | 140 |
| Edge distance $c_{min}$ | | 100 | 220 | | 100 | 220 | | 220 | 220 | 220 | 250 |
| $F_{R,d}$ [kN] | transversal | 12,2 | 12,7 | | 12,2 | 12,7 | | 12 | 12 | 12 | 12 |
| | axial | / | 17,5 | | / | 17,5 | | / | / | / | / |
| Max. number of users | | 3 | 3 | | 3 | 3 | | 3 | 3 | 3 | 3 |

Table 2

| Anchor | | FAZ II 10/20 R[a] | | | BZ3 M10x 105/20 A4[b] | | | BZ 10-10-30/90 A4[c] | W-FAZ M10 A4[d] | HST2-R M10x90/10[e] | BSZ-SU 10x100 A4[f] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Manufacturer | | Fischer | | | MKT | | | MKT | Würth | Hilti | MKT |
| Drilling diameter $d_0$ [mm] | | 10 | | | 10 | | | 10 | 10 | 10 | 10 |
| Drilling depth $h_1$ [mm] | | 75 | | | 75 | | | 75 | 75 | 75 | 105 |
| Effective anchorage depth $h_{ef}$ [mm] | | 60 | | | 60 | | | 60 | 60 | 60 | 75 |
| min. Concrete thickness $h_{min}$ [mm] | | 110 | | | 110 | | | 120 | 120 | 120 | 140 |
| Edge distance $c_{min}$ [mm] | | 250 | 75 | 150 | 250 | 75 | 150 | 250 | 250 | 250 | 250 |
| $F_{R,d}$ [kN] | transversal | 13,3 | 12,4 | 12,4 | 13,3 | 12,4 | 12,4 | 12 | 12 | 12 | 12 |
| | axial | 22,4 | / | 9,6 | 22,4 | / | 9,6 | / | / | / | / |
| Max. number of users | | 3 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 3 |

a ETA-05/0069 fischer Bolt Anchor FAZ II
b ETA-19/0619 MKT bolt anchor BZ3 / BZ3 A4 / BZ3 HCR8
c ETA-99/0010 MKT bolt anchor BZ plus and BZ-IG
d ETA-99/0011 Würth Fixanchor W-FAZ and W-FAZ-IG
e ETA-15/0435 Hilti Expansion Anchor HST2 and HST2-R
f ETA-16/0204 Concrete screw BSZ

Fall protection systems for anchoring in concrete substrates

Overview and design values

Annex 1.3

Table 3

| Anchor | | FAZ II 12/20 R[a] | BZ3 M12x 115/20 A4[b] |
|---|---|---|---|
| Manufacturer | | Fischer | MKT |
| Drilling diameter $d_0$ [mm] | | 12 | 12 |
| Drilling depth $h_1$ [mm] | | 90 | 90 |
| Effective anchorage depth $h_{ef}$ [mm] | | 70 | 70 |
| min. Concrete thickness $h_{min}$ [mm] | | 120 | 120 |
| Edge distance $c_{min}$ | | 150 | 150 |
| $F_{R,d}$ [kN] | transversal | 12,2 | 12,2 |
| | axial | | |
| Max. number of users | | 3 | 3 |

Table 4

| Anchor | | FAZ II 12/20 R[a] | BZ3 M12x 115/20 A4[b] |
|---|---|---|---|
| Manufacturer | | Fischer | MKT |
| Drilling diameter $d_0$ [mm] | | 12 | 12 |
| Drilling depth $h_1$ [mm] | | 90 | 90 |
| Effective anchorage depth $h_{ef}$ [mm] | | 70 | 70 |
| min. Concrete thickness $h_{min}$ [mm] | | 120 | 120 |
| Edge distance $c_{min}$ | | 220 | 220 |
| $F_{R,d}$ [kN] | transversal | 13,2 | 13,2 |
| | axial | / | / |
| Max. number of users | | 3 | 3 |

[a] ETA-05/0069 fischer Bolt Anchor FAZ II
[b] ETA-19/0619 MKT bolt anchor BZ3 / BZ3 A4 / BZ3 HCR8

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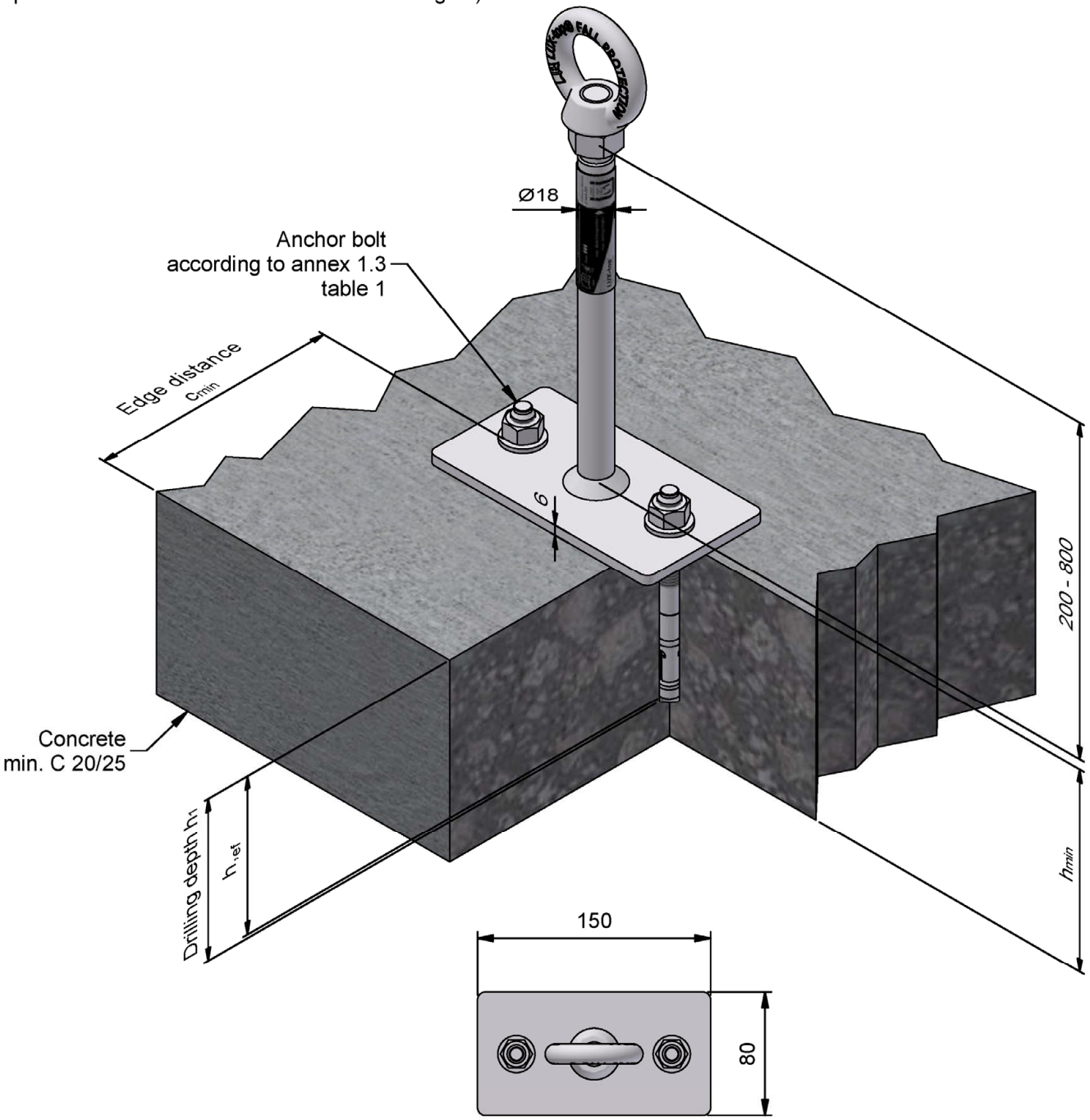
| Design values of the load capacity | | | | |
|---|---|---|---|---|
| **Anchor device** | **Support structure** | **Load direction** | **$F_{R,d}$ [kN]** | **Max. number of users** |
| LUX-top® AP2s-18 | Concrete | see annex 1.3 table 1 | see annex 1.3 table 1 | see annex 1.3 table 1 |

Deformation capacity at 0.70 kN:
10.2 mm at a maximum overall height of 800 mm
(no performance evaluation for lower overall heights)

For mounting on beam-shaped components align the base plate parallel to the longitudinal axis of the beam!




All dimensions in [mm]

| | |
|---|---|
| Fall protection systems for anchoring in concrete substrates | Annex 2 |
| LUX-top® AP2s-18 | |

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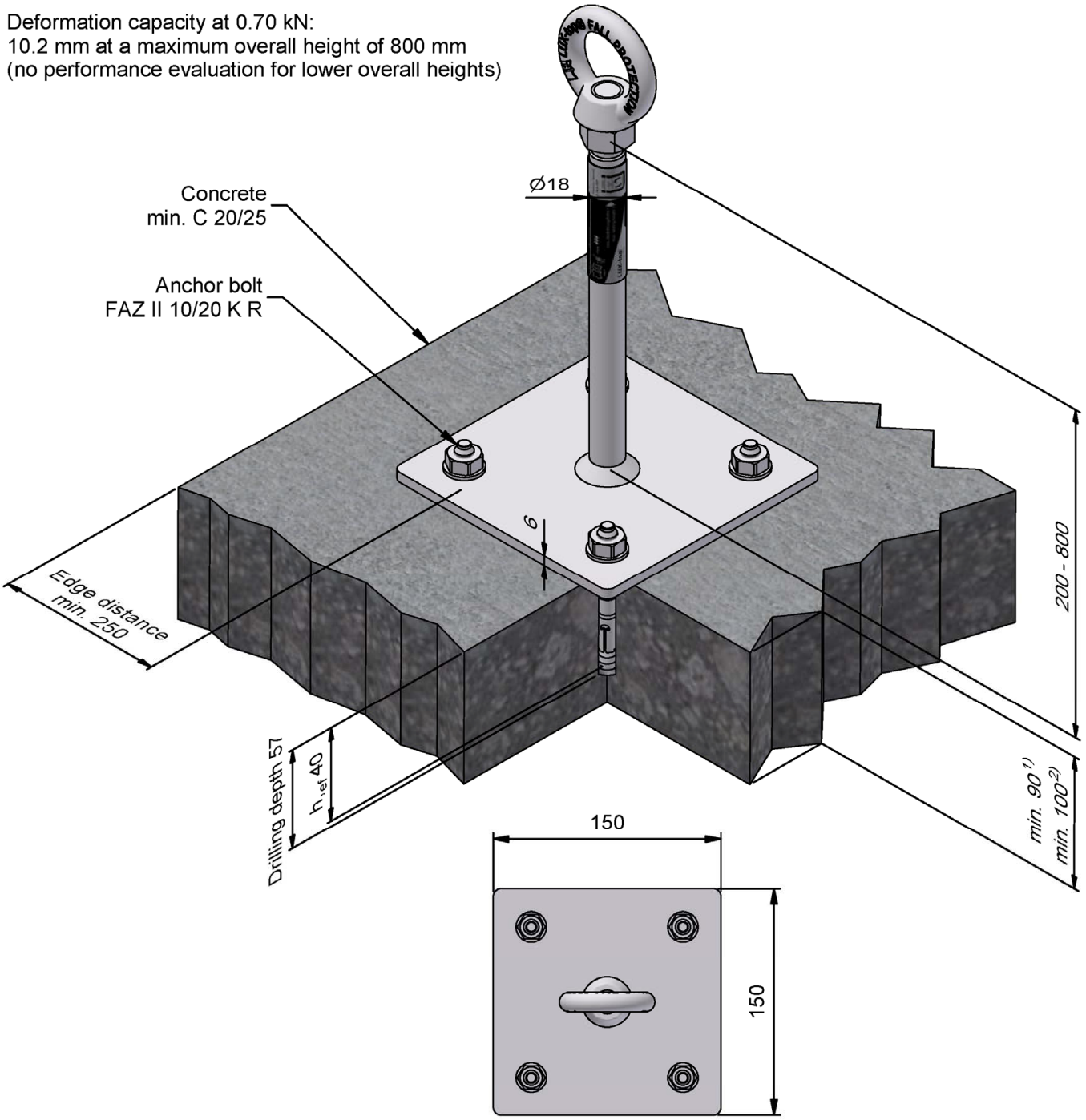
| Design values of the load capacity | | | | |
|---|---|---|---|---|
| **Anchor device** | **Support structure** | **Load direction** | **$F_{R,d}$ [kN]** | **Max. number of users** |
| LUX-top® AP2-18 | Concrete [1)] | transversal<br>axial | 9,2<br>16,0 | 1 |
| LUX-top® AP2-18 | Concrete [2)] | transversal<br>axial | 12,0<br>16,0 | 3 |

Deformation capacity at 0.70 kN:
10.2 mm at a maximum overall height of 800 mm
(no performance evaluation for lower overall heights)




All dimensions in [mm]

| | |
|---|---|
| Fall protection systems for anchoring in concrete substrates | Annex 3 |
| LUX-top® AP2-18 - reduced anchorage depth | |

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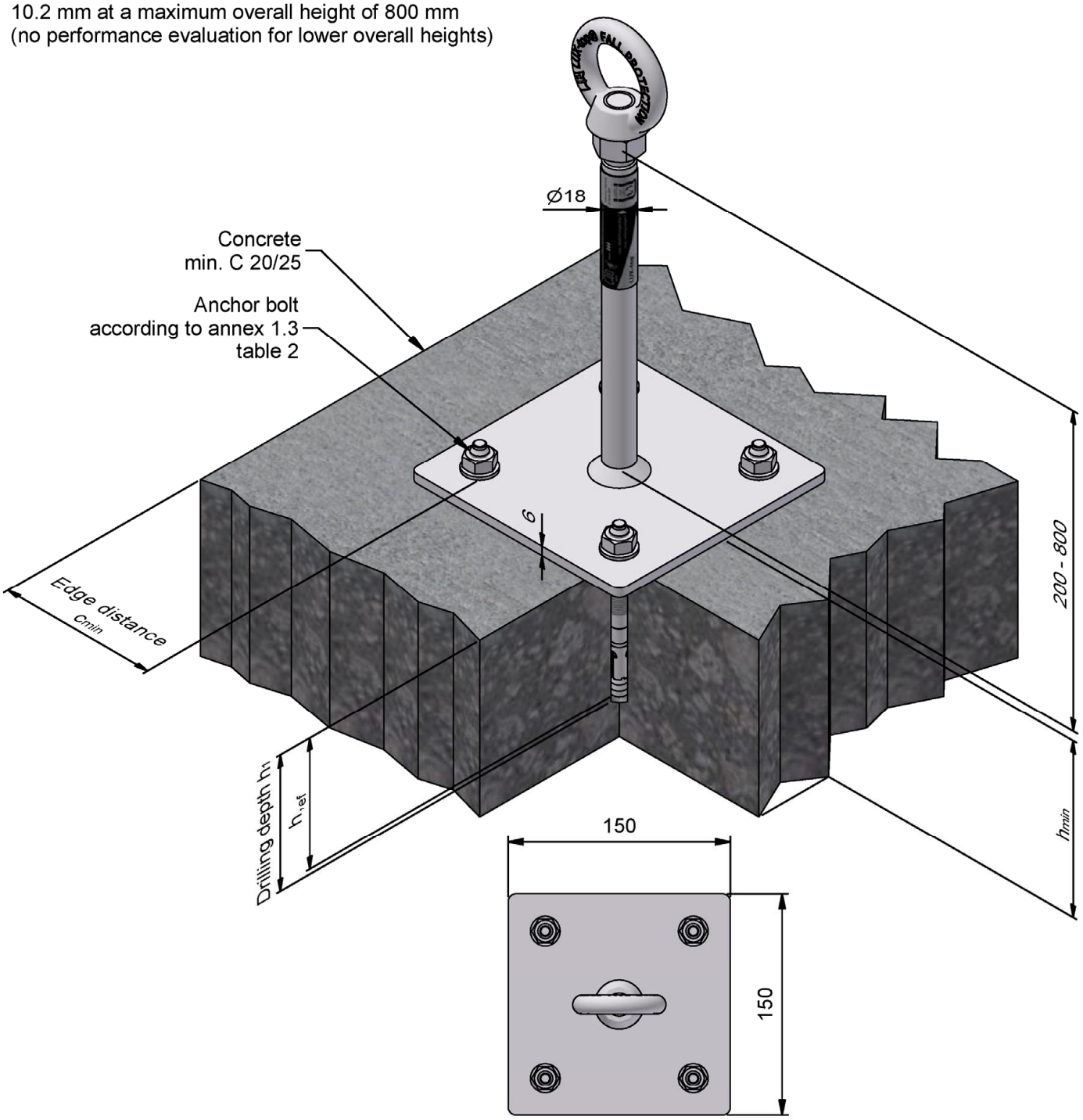
| Design values of the load capacity | | | | |
|---|---|---|---|---|
| **Anchor device** | **Support structure** | **Load direction** | **$F_{R,d}$ [kN]** | **Max. number of users** |
| LUX-top® AP2-18 | Concrete | see annex 1.3 table 2 | see annex 1.3 table 2 | see annex 1.3 table 2 |

Deformation capacity at 0.70 kN:
10.2 mm at a maximum overall height of 800 mm
(no performance evaluation for lower overall heights)




All dimensions in [mm]

| | |
|---|---|
| Fall protection systems for anchoring in concrete substrates | Annex 4 |
| LUX-top® AP2-18 | |

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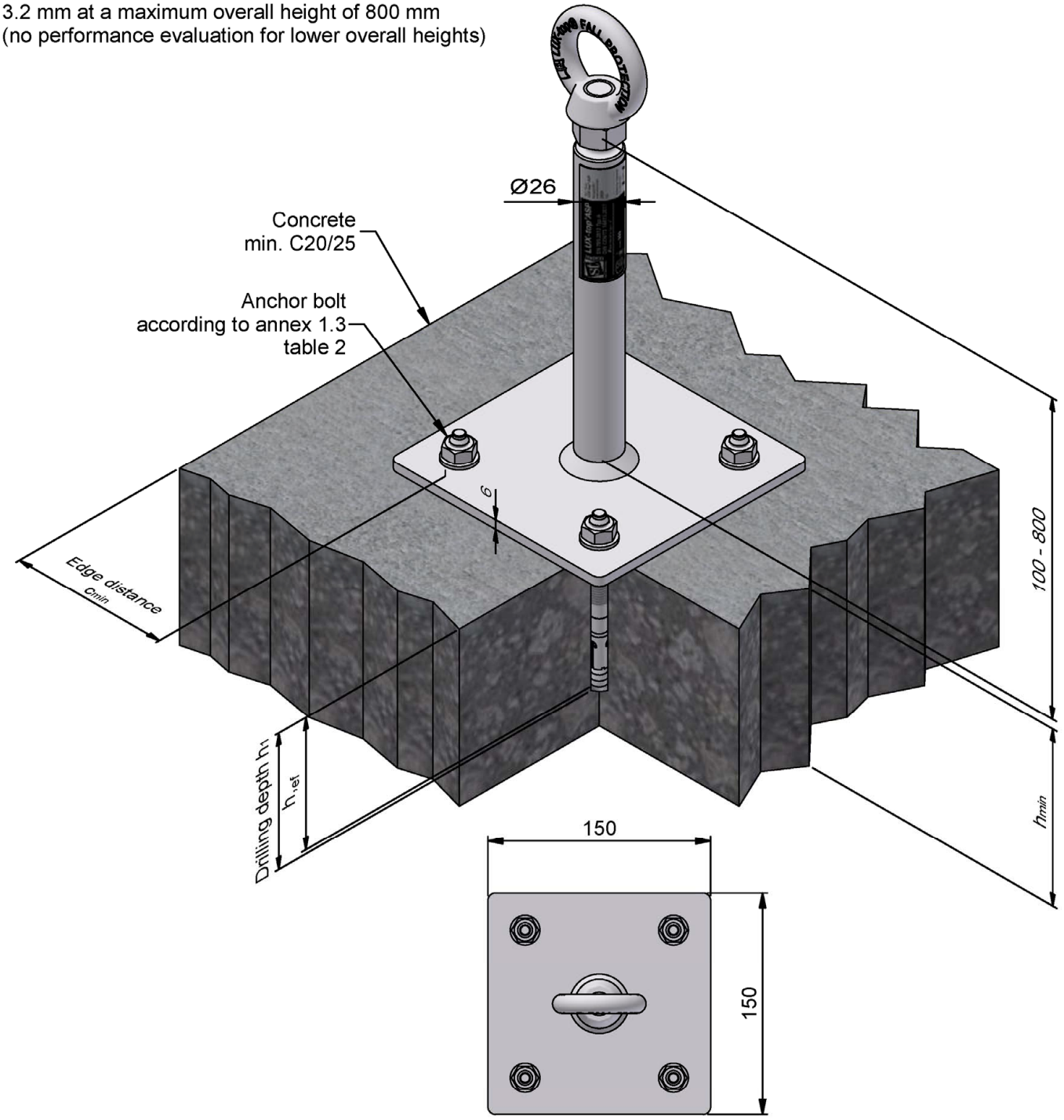
| Design values of the load capacity | | | | |
|---|---|---|---|---|
| **Anchor device** | **Support structure** | **Load direction** | **$F_{R,d}$ [kN]** | **Max. number of users** |
| LUX-top® AP2-26 | Concrete | see annex 1.3 table 2 | see annex 1.3 table 2 | see annex 1.3 table 2 |

Deformation capacity at 0.70 kN:
3.2 mm at a maximum overall height of 800 mm
(no performance evaluation for lower overall heights)

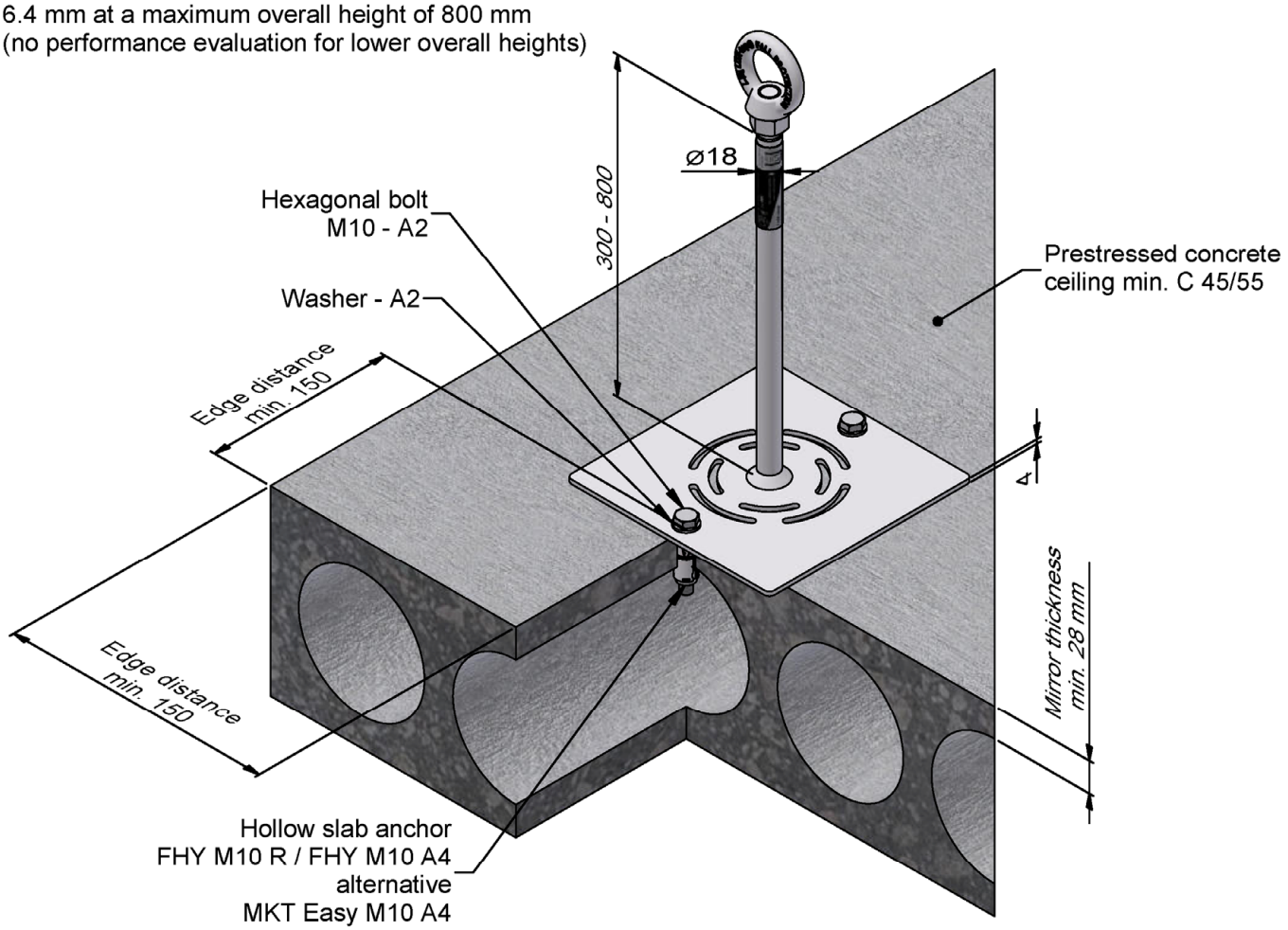


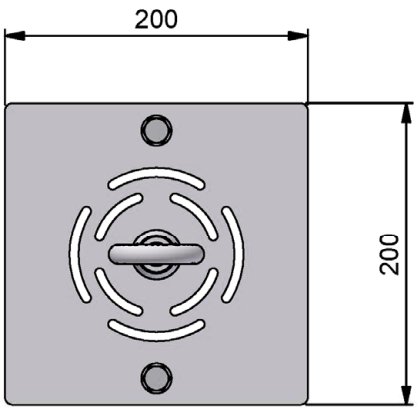

All dimensions in [mm]

| | |
|---|---|
| Fall protection systems for anchoring in concrete substrates | Annex 5 |
| LUX-top® AP2-26 | |

| Design values of the load capacity | | | | |
|---|---|---|---|---|
| **Anchor device** | **Support structure** | **Load direction** | **$F_{R,d}$ [kN]** | **Max. number of users** |
| LUX-top® AP10 II | Prestressed concrete hollow core slab | transversal | 12,0 | 3 |
| | | axial | 12,0 | 3 |

Deformation capacity at 0.70 kN:
6.4 mm at a maximum overall height of 800 mm
(no performance evaluation for lower overall heights)




All dimensions in [mm]

| | |
|---|---|
| Fall protection systems for anchoring in concrete substrates | Annex 6 |
| LUX-top® AP10 II | |

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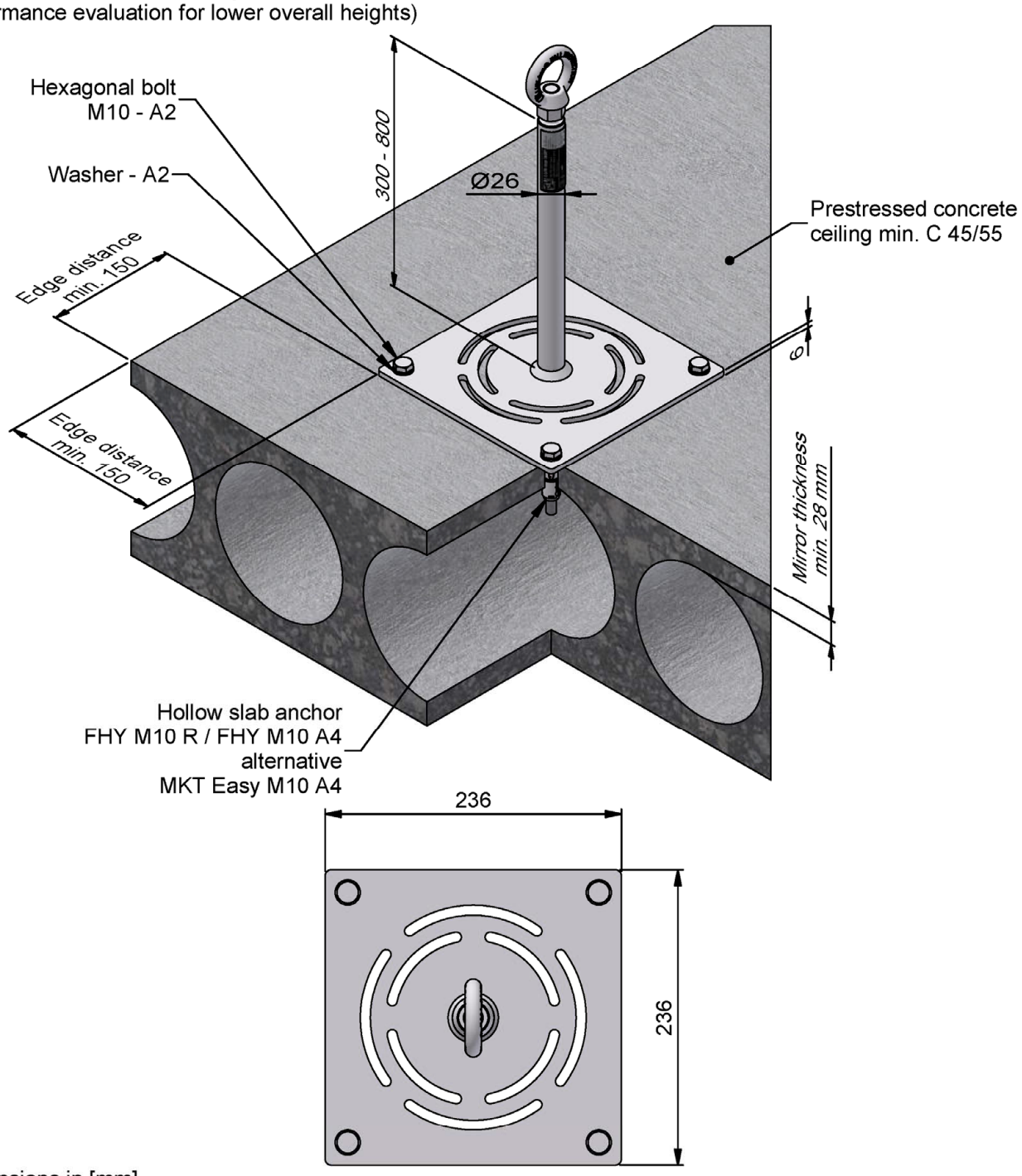
| Design values of the load capacity | | | | |
|---|---|---|---|---|
| **Anchor device** | **Support structure** | **Load direction** | **$F_{R,d}$ [kN]** | **Max. number of users** |
| LUX-top® AP10 III | Prestressed concrete hollow core slab | transversal | 12 | 3 |
| | | axial | 12 | 3 |

Deformation capacity at 0.70 kN:
3.2 mm at a maximum overall height of 800 mm
(no performance evaluation for lower overall heights)




All dimensions in [mm]

| | |
|---|---|
| Fall protection systems for anchoring in concrete substrates | Annex 7 |
| LUX-top® AP10 III | |

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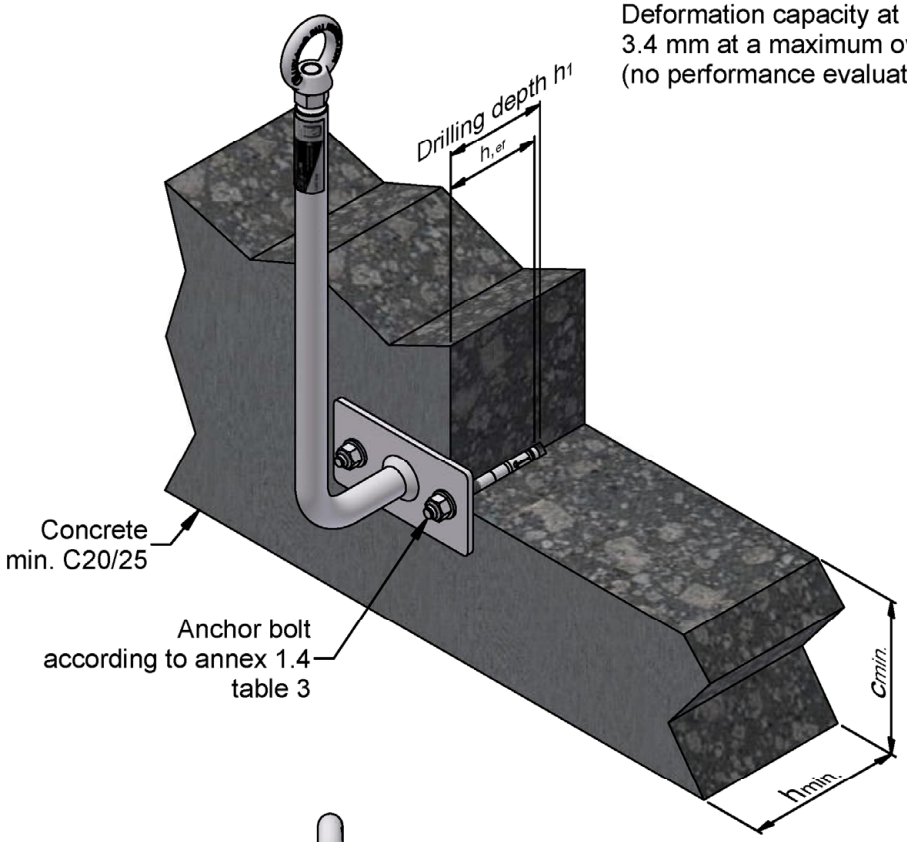
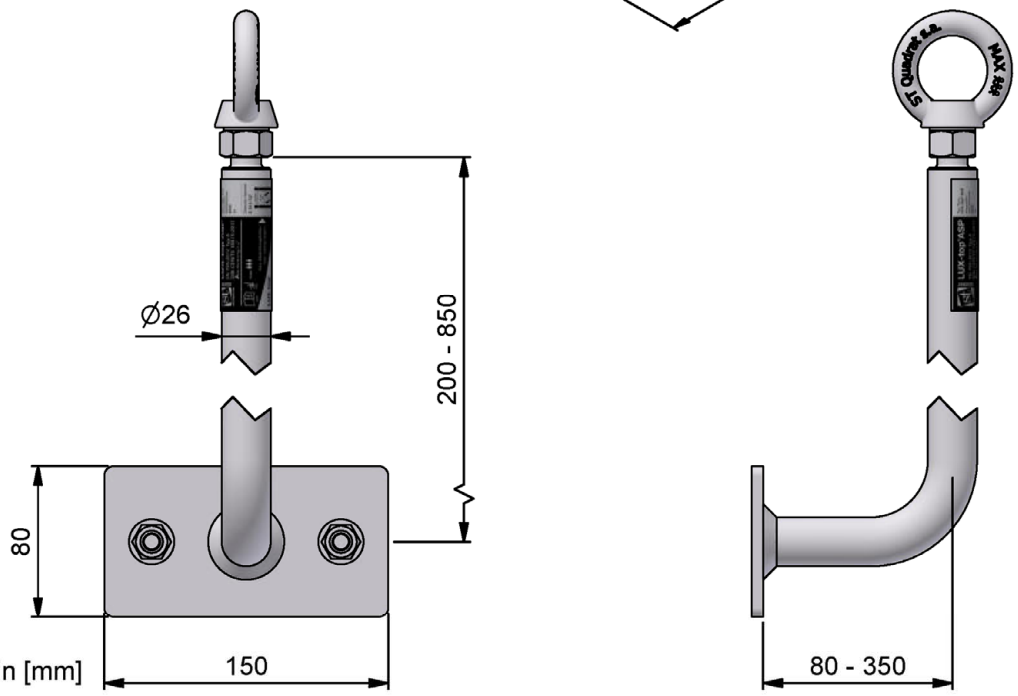
| Design values of the load capacity | | | | |
|---|---|---|---|---|
| **Anchor device** | **Support structure** | **Load direction** | **$F_{R,d}$ [kN]** | **Max. number of users** |
| LUX-top® AP2s-90° | Concrete | see annex 1.4 table 3 | see annex 1.4 table 3 | see annex 1.4 table 3 |

Deformation capacity at 0.70 kN:
3.4 mm at a maximum overall height of 850 mm
(no performance evaluation for lower overall heights)




All dimensions in [mm]

Fall protection systems for anchoring in concrete substrates

LUX-top® AP2s-90°

Annex 8

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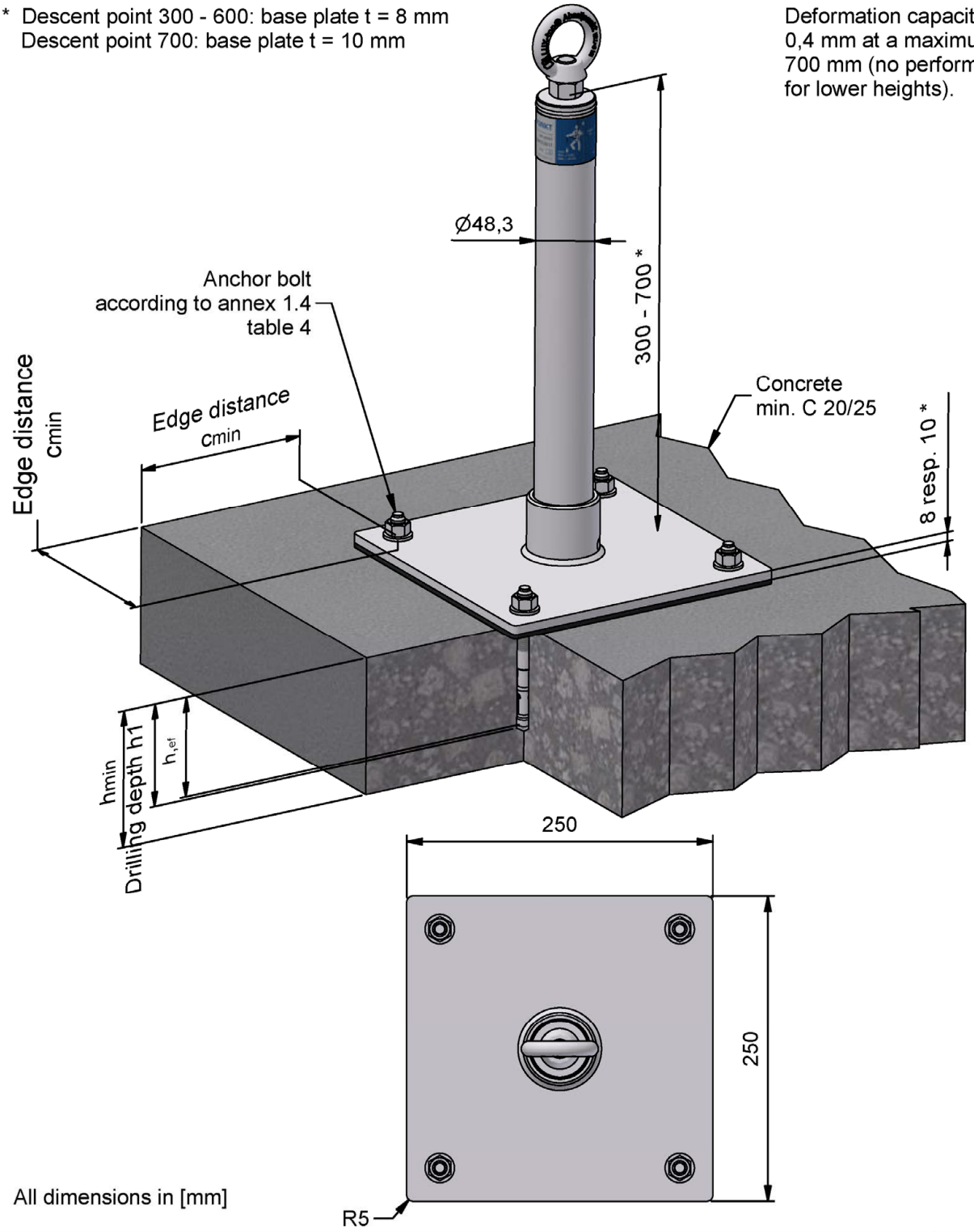
| Design values of the load capacity | | | | |
|---|---|---|---|---|
| **Anchor device** | **Support structure** | **Load direction** | **$F_{R,d}$ [kN]** | **Max. number of users** |
| LUX-top® RGD | Concrete | see annex 1.4 table 4 | see annex 1.4 table 4 | see annex 1.4 table 4 |

* Descent point 300 - 600: base plate t = 8 mm
Descent point 700: base plate t = 10 mm

Deformation capacity at 0,70 kN: 0,4 mm at a maximum height of 700 mm (no performance rating for lower heights).




All dimensions in [mm]

Fall protection systems for anchoring in concrete substrates

LUX-top® RGD (Descent point) - Concrete fastening

Annex 9