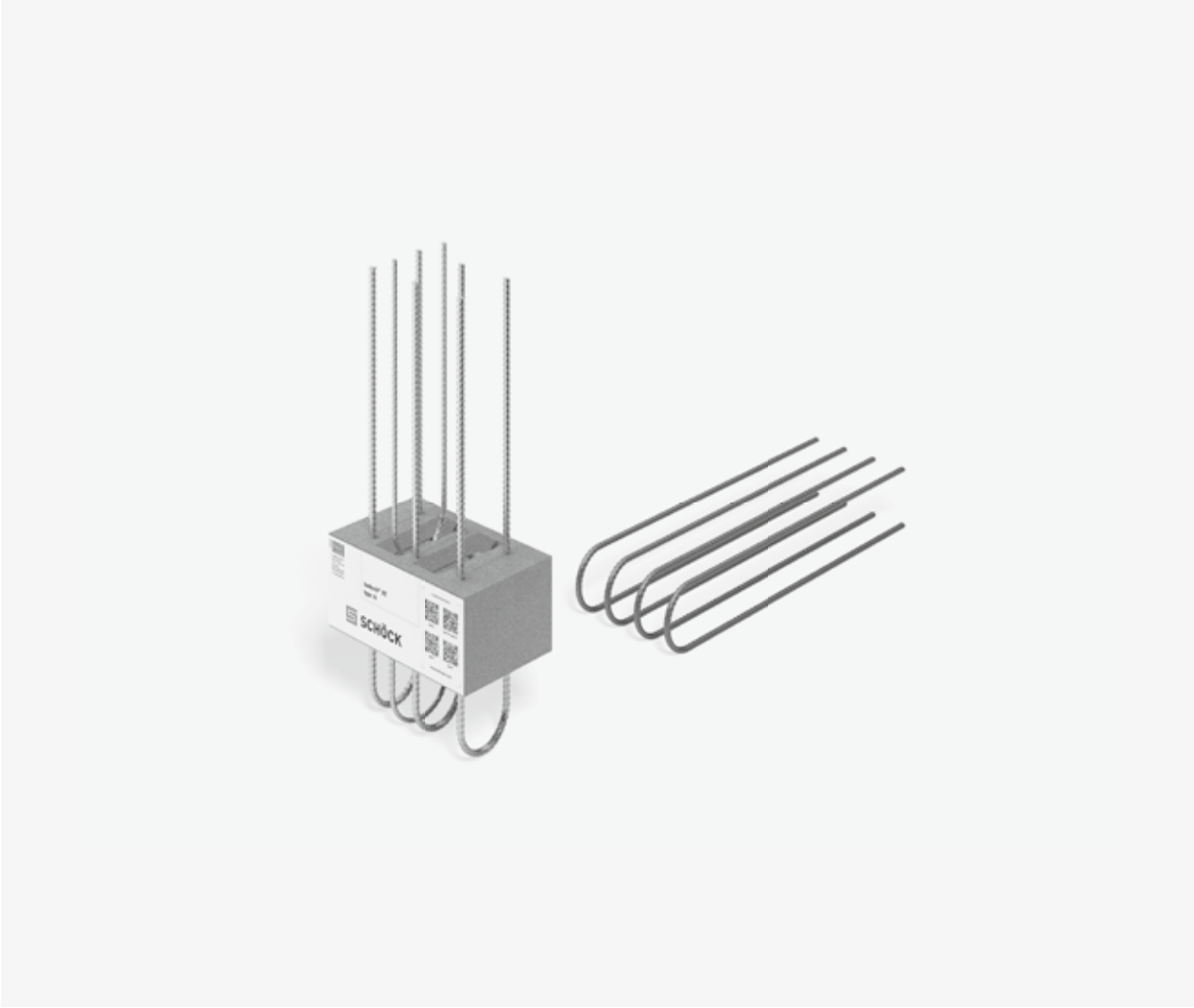
Schöck Isokorb® XT type A



Schöck Isokorb® XT type A
Load-bearing thermal insulation element for parapets and balustrades. The element transfers moments, shear forces and positive normal forces.

Element arrangement | Installation cross sections

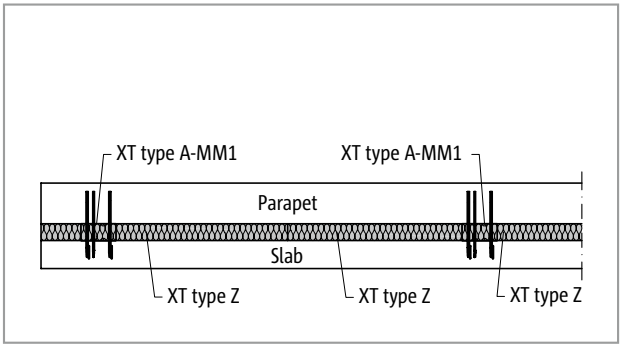


Fig. 255: Schöck Isokorb® XT type A, Z: Attic (XT type A-MM1)

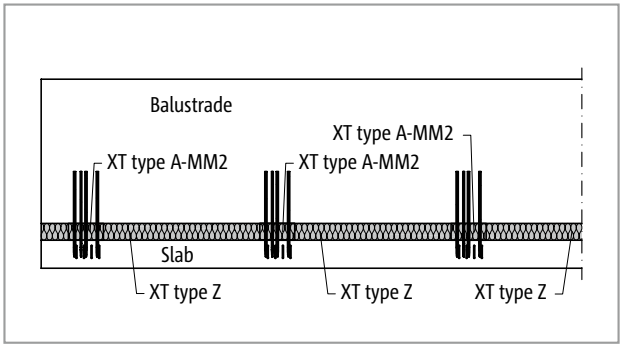


Fig. 256: Schöck Isokorb® XT type A, Z: Parapet (XT type A-MM2)

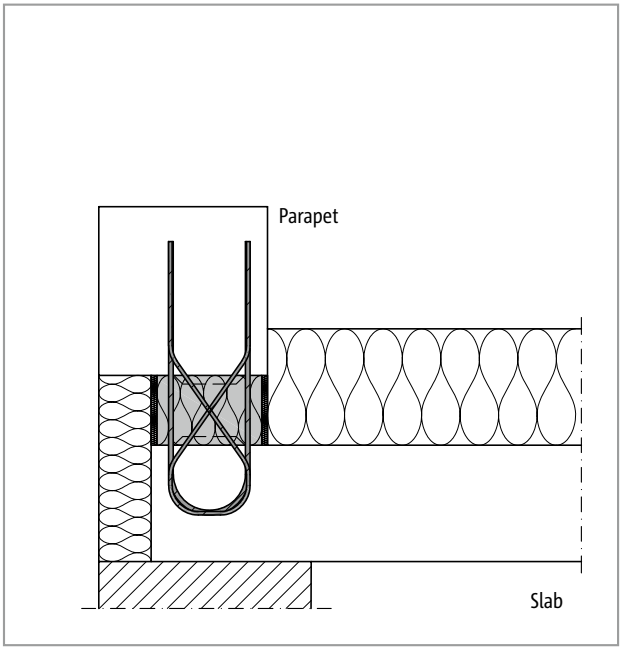


Fig. 257: Schöck Isokorb® XT type A: Connection of a parapet (XT type A-MM1)

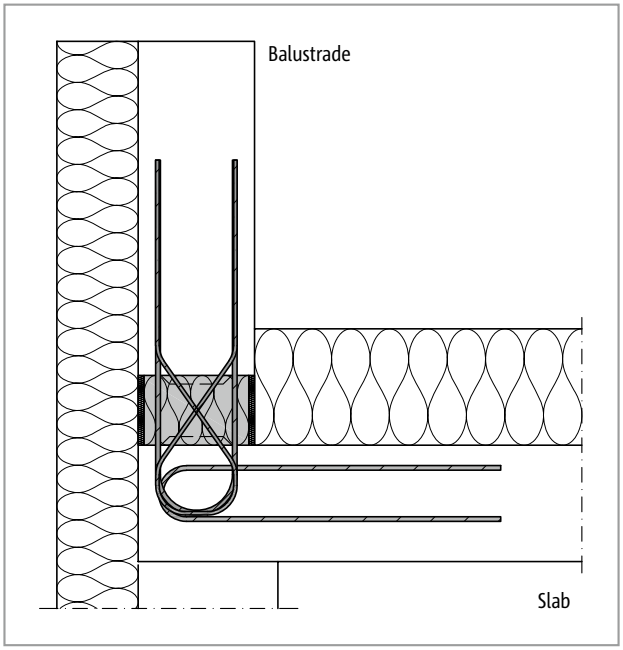


Fig. 258: Schöck Isokorb® XT type A: Connection to a balustrade (XT type A-MM2)

Element arangement/installation cross-section

- For the insulation between the Schöck Isokorb® the Schöck Isokorb® XT type Z (see page 151) is available in fire protective configuration.

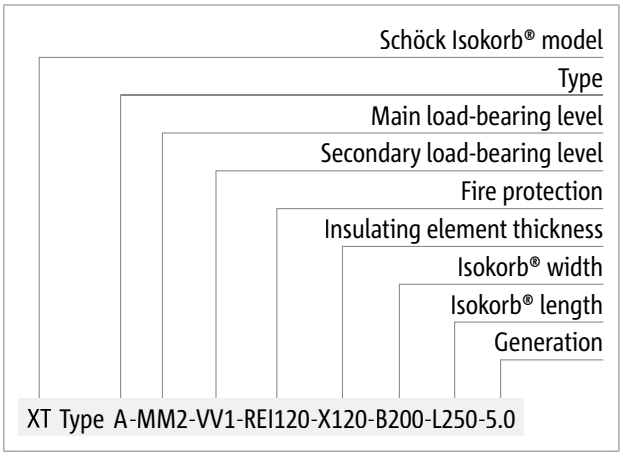
Product selection | Type designations | Special designs

Schöck Isokorb® XT type A variants

The configuration of the Schöck Isokorb® XT type A can vary as follows:

- Main load-bearing level:
  MM1 for parapets
  MM2 for balustrades
- Secondary load-bearing level:
  VV1
- Fire resistance class:
  REI120 (standard): Top and bottom fire protection projecting by 10mm on both sides
- Insulating element thickness:
  X120 = 120 mm
- Isokorb® width:
  B = 160 to 250 mm, R0, REI120
- Isokorb® length:
  L = 250 mm
- Generation:
  5.0

Type designations in planning documents



Special designs

Please contact the design support department if you have connections that are not possible with the standard product variants shown in this information (contact details on page 3).

Sign convention

Sign convention for the design

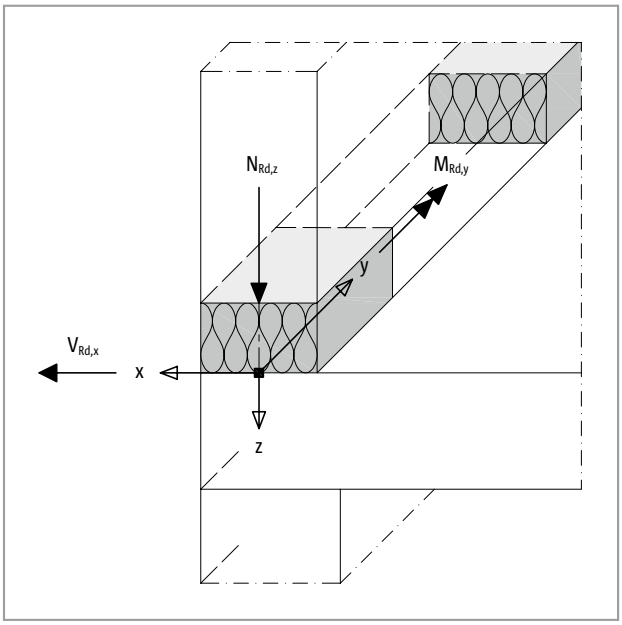


Fig. 259: Schöck Isokorb® XT type A: Sign convention for the design

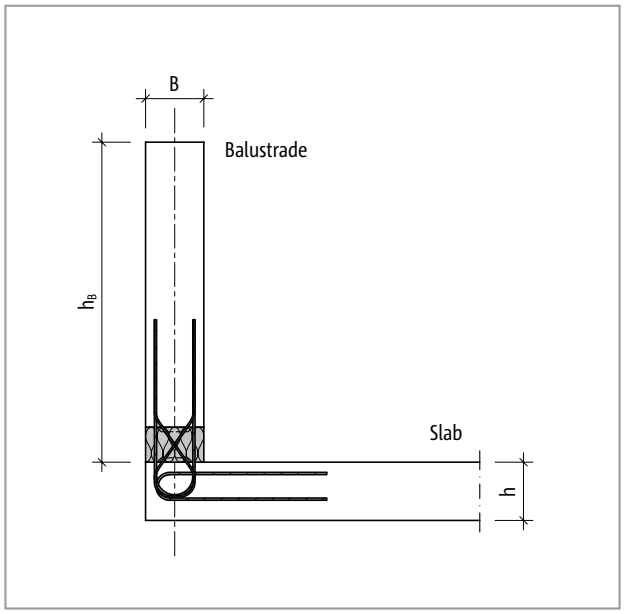


Fig. 260: Schöck Isokorb® XT type A: Static system

Determination of spacing

Determination of the maximum spacing

The maximum spacing a_{max} of several Schöck Isokorb® type A depends on the applied moments $m_{Ed,y}$, normal forces $n_{Ed,z}$ and shear forces $v_{Ed,x}$. It can be determined with the aid of the procedure described below.

Verification is provided if the selected distance $a_{prov} \leq a_{max}$ is = min ($a_{max,1}$; $a_{max,2}$). Then, no further verification of the design internal forces is required.

How to proceed:

Determination $a_{max,1}$ (diagram)

The maximum centre distance $a_{max,1}$of several Schöck Isokorb® type A can be determined depending on the applied moments $m_{Ed,y}$ and normal forces $n_{Ed,z}$ with the aid of the following diagram.

- Determination of the applied moments $m_{Ed,y}$ and normal forces $n_{Ed,z}$
- Calculation of the ratio $n_{Ed,z}/m_{Ed,y}$
- Read up the righthand axis for $n_{Ed,z}/m_{Ed,y}$ using the calculated ratio ①
- Draw horizontal line up to the intersection point with the graphs (Take note of Schöck Isokorb® type and width)
- Draw vertical line in the intersection point and read off $N_{Rd,z}$ (intersection point of the vertical line with $N_{Rd,z}$ axis) ②
- Determination of the maximum distance: $a_{max,1} = N_{Rd,z}/n_{Ed,z}$

Determination $a_{max,2}$

The maximum spacing $a_{max,2}$ of several Schöck Isokorb® type A depending on the applied shear force is determined by the ratio $a_{max,2} = V_{Rd,x}/v_{Ed,x}$.

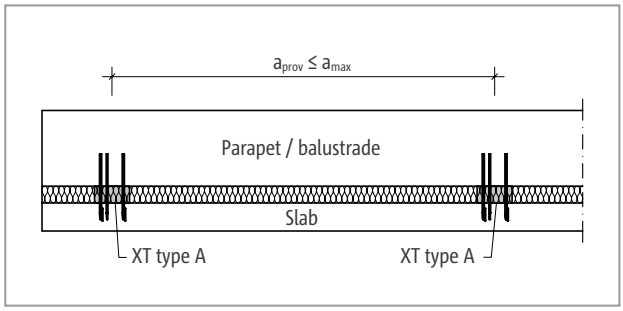


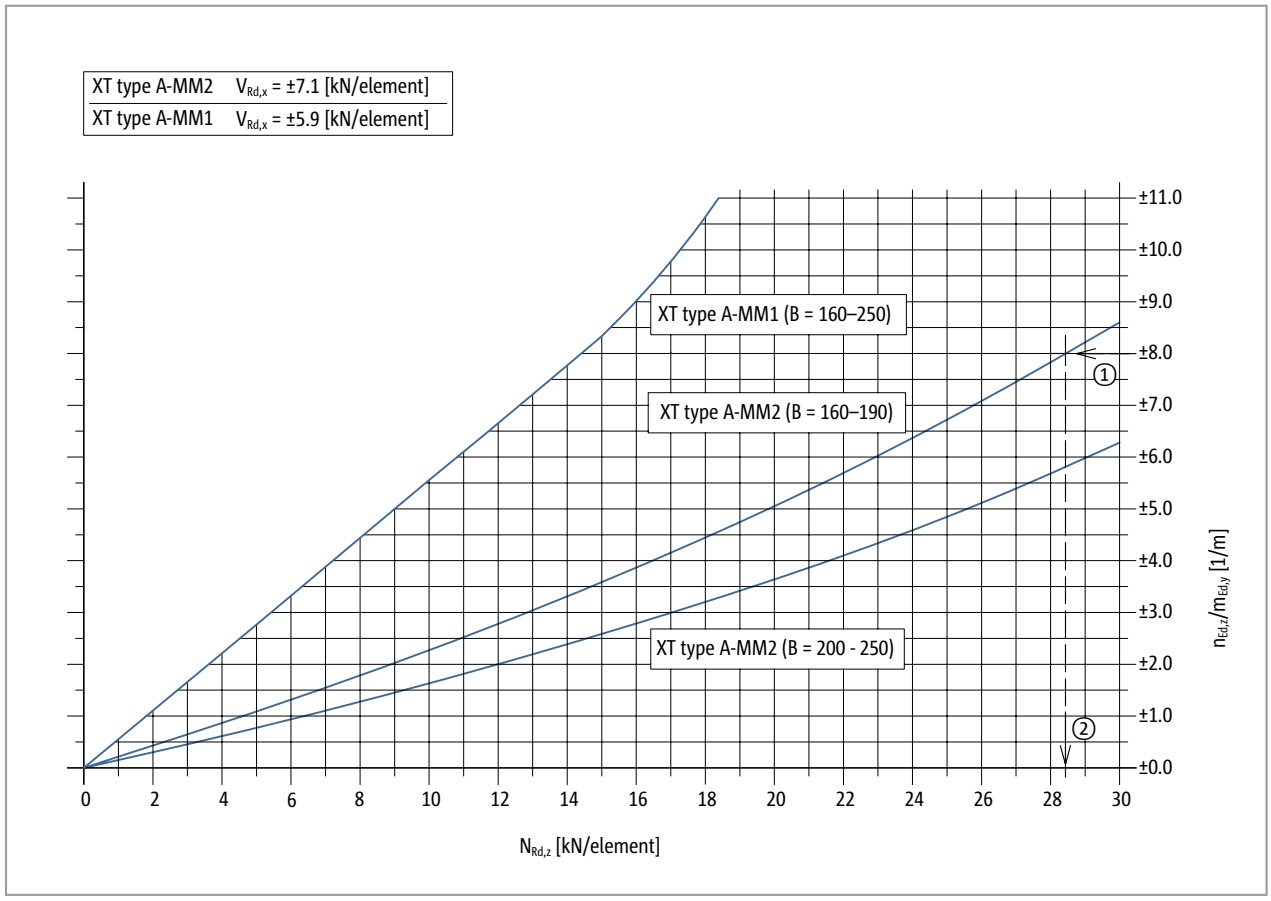
Fig. 261: Schöck Isokorb® XT type A: Verification met if selected distance $a_{prov} \leq a_{max}$

Numerical example of determination of centre distances

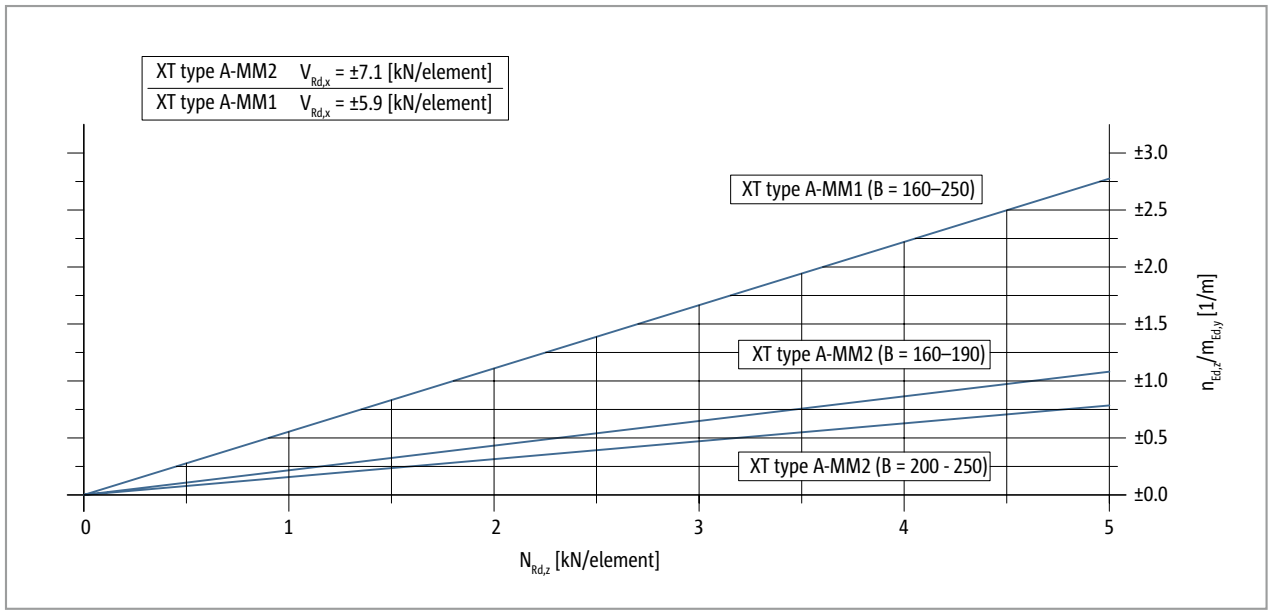
Given:	XT type A-MM2	B = 190 mm
Internal forces per metre connection length		
	$n_{Ed,z}$	= 12.0 kN/m
	$v_{Ed,x}$	= 2.0 kN/m
	$m_{Ed,y}$	= 1.5 kNm/m
Determination $a_{max,1}$		
Input value ①	$n_{Ed,z}/m_{Ed,y}$	= 12.0 [kN/m] / 1.5[kNm/m] = 8.0 [1/m]
Read ②	$N_{Rd,z}$	= 28.47 kN
	$a_{max,1}$	= 28.47 kN / 12.0 [kN/m] = 2.37 m
Determination a_{max2}	$a_{max,2}$	= 7.1 kN / 2.0 [kN/m] = 3.55 m
⇒	a_{max}	**= 2.37 m**

Determination of spacing

Diagram spacing (0 < $N_{Rd,z}$ < 30 [kN/element])



Detailed view diagram spacing (0 < $N_{Rd,z}$ < 5 [kN/element])



Determination of spacing

- For $n_{ed,z}$ = 0 or $m_{ed,y}$ = 0, use design variants A or B.

Design variants

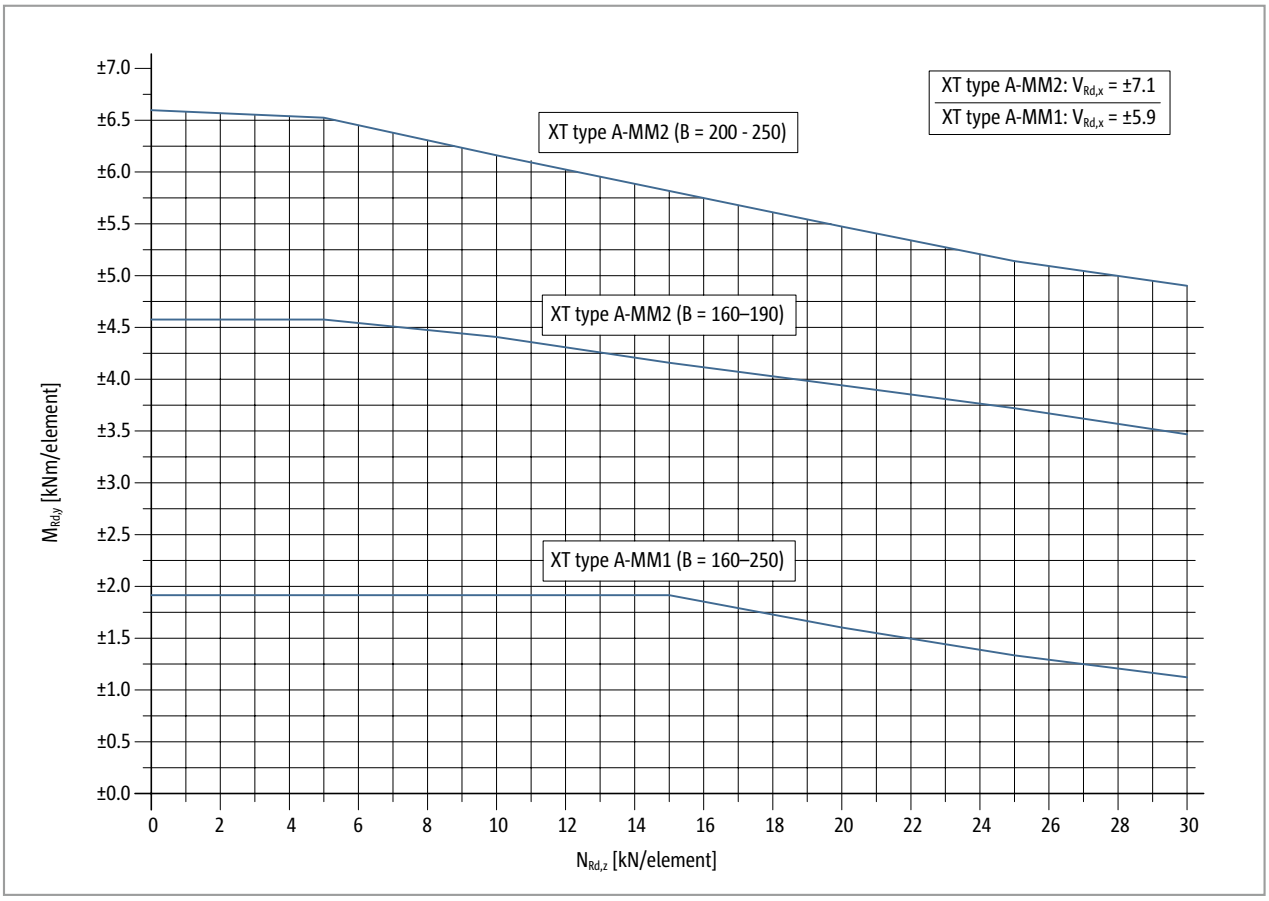
The Schöck Isokorb® XT type A, independent of the allowable normal force $N_{Rd,z}$ and the acceptable moment $M_{Rd,y,}$ has a constant acceptable shear force$_{Rd,x}$. The allowable moment $M_{Rd,y}$ and the acceptable normal force $N_{Rd,z}$ condition each other in one interaction. For the design of the Schöck Isokorb® XT type A there are two **design variants A and B** available.

- **Design variant A**:
  In the **design diagram** the interaction of acceptable normal force $N_{Rd,z}$ [kN/element] and moment loading $M_{Rd,y}$ [kN/element] are presented graphically. The verification is met if the intersection point from the applied normal force $N_{Ed,z}$ [kN/element] and the applied moment $M_{Ed,y}$ [kN/element] lies below or at the graphs applicable for the respective Schöck Isokorb® type.
- **Design variant B**:
  In the **interactions table** the allowable moments $M_{Rd,y}$ [kN/element] are given depending on the acceptable normal force $N_{Rd,z}$ [kN/element].

Schöck Isokorb® XT type A	MM1	MM2
Placement with	Isokorb® length [mm]	
	250	250
Tension bars/compression bars	2 × 2 ⌀ 8	2 × 3 ⌀ 8
Shear force bars	1 ⌀ 6 + 1 ⌀ 6	1 ⌀ 6 + 1 ⌀ 6
Connection stirrup	2 ⌀ 8	4 ⌀ 8
Parapet/balustrade B_{min}	160	160
Floor h_{min} [mm]	160	160

Design variants C25/30

Design variant A: Design diagram



Design variant B: Interaction table

Schöck Isokorb® XT type A		MM1 (B = 160–250)	MM2 (B = 160–190)	MM2 (B = 200–250)
Design values with		Concrete strength class ≥ C25/30		
		$M_{Rd,y}$ [kNm/element]		
$N_{Rd,z}$ [kN/Element]	0.0	±1.80	±4.60	±6.60
	5.0	±1.80	±4.60	±6.48
	10.0	±1.80	±4.41	±6.15
	15.0	±1.80	±4.18	±5.82
	20.0	±1.57	±3.95	±5.49
	25.0	±1.34	±3.72	±5.16
	30.0	±1.11	±3.49	±4.83

Notes on design

- The design values of the Schöck Isokorb® XT type A apply for a horizontal unidirectional action, i.e. negative shear force with positive moment or positive shear force with negative moment. The Schöck Isokorb® XT type F is recommended for further combinations.
- The design values for a concrete strength class ≥ C25/30 are given for balustrade side and floor side.
- The shear force loading of the slabs in the area of the insulation joint is to be limited to $V_{Rd,max}$, whereby $V_{Rd,max}$, acc. to BS EN 1992-1-1 (EC2), Exp. (6.9) is determined for $\theta = 45°$ and $\alpha = 90°$ (slab load-bearing capacity).
- The indicative minimum concrete strength class of the external structural component is C32/40.
- The design software Attika-Tool is available for the rapid and optimum planning under www.schoeck.com/de/downloads.

Expansion joint spacing | Edge spacing

Maximum expansion joint spacing

Expansion joints are to be arranged in the external structural components. The longitudinal change due to temeperature is related to the maximum distance e_a of the outer edges of the outermost Schöck Isokorb® types. With this the outer structural component can project laterally over the Schöck Isokorb®.

With fixed points such as, for example corners, half the maximum length e_a applies.

The shear force transmission in the expansion joint can be ensured using a longitudinally displaceable shear force dowel, e.g. Schöck Stacon®.

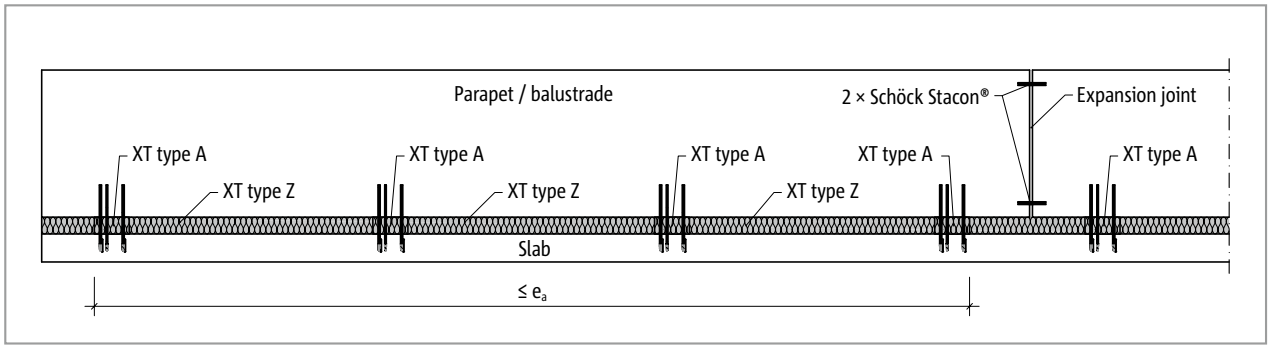


Fig. 262: Schöck Isokorb® XT type A: Expansion joint arrangement

Schöck Isokorb® XT type A		MM1, MM2
Distance for		e_a [m]
Insulating element thickness [mm]	120	23.0

Edge distances

The Schöck Isokorb® must be so arranged at the expansion joint that the following conditions are met:

- The following applies for the distance of the insulating element from the edge of the parapet or from the expansion joint: $e_R \geq 10$ mm.
- The following applies for the distance of the insulating element from the edge of the floor: $e_R \geq 60$ mm.
- The following applies for the distance of the connection stirrup from the edge of the floor in the floor: $e_R \geq 100$ mm.
- The edge distances in floor and balustrade are not required to be the same.

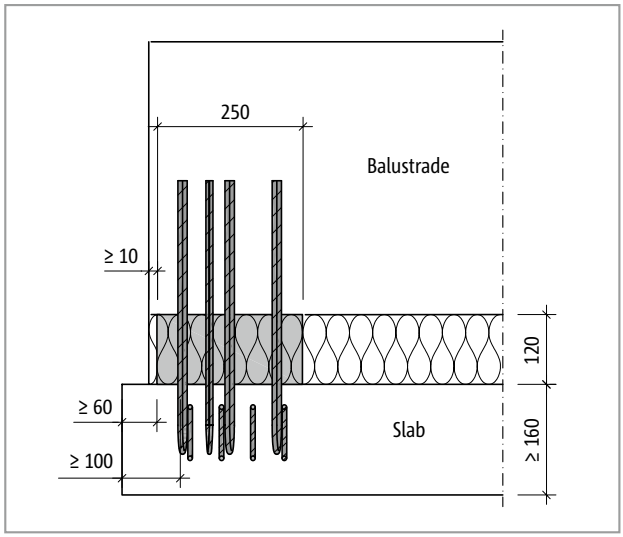


Fig. 263: Schöck Isokorb® XT type A: View of edge spacings

Product description

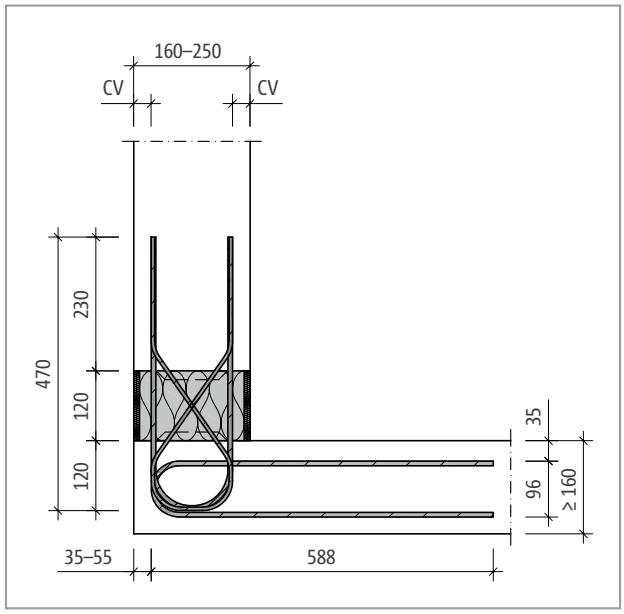


Fig. 264: Schöck Isokorb® XT type A-MM1: Product section

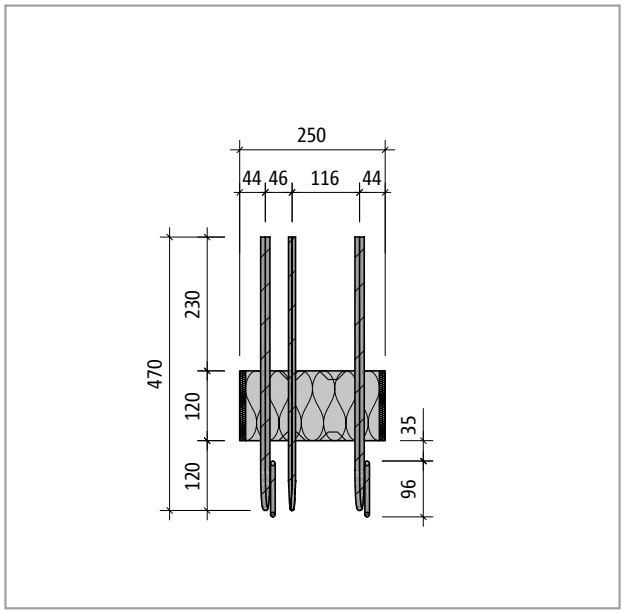


Fig. 265: Schöck Isokorb® XT type A-MM1: Product view

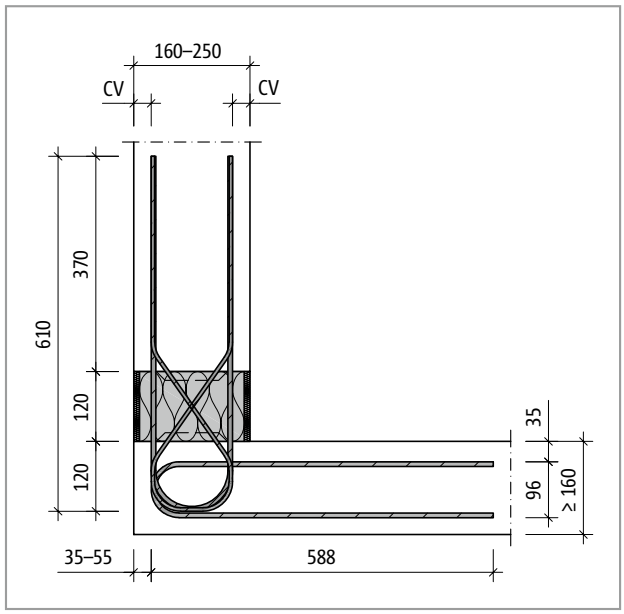


Fig. 266: Schöck Isokorb® XT type A-MM2: Product section

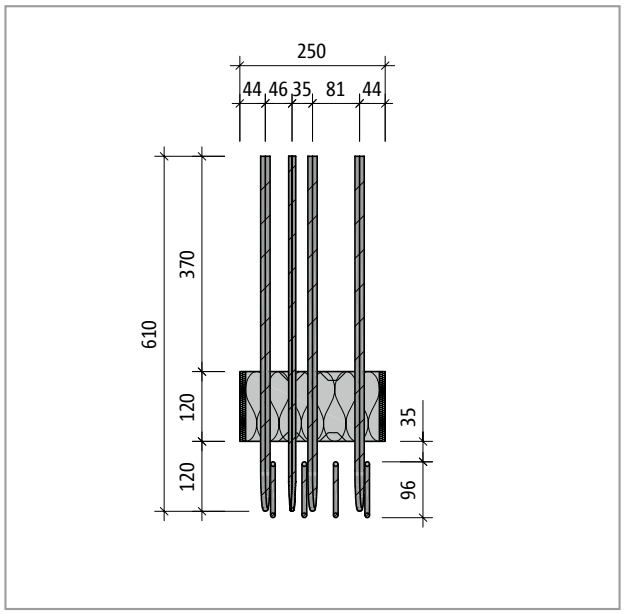


Fig. 267: Schöck Isokorb® XT type A-MM2: Product view

Product information

- Note minimum width of parapet or balustrade B_{min} = 160 mm, minimum floor height h_{min} = 160 mm.
- Download further product plan views and cross-sections at cad.schoeck.co.uk
- The concrete cover of the connection stirrup should be at least 35 mm.

Concrete cover

Concrete cover

The concrete cover CV of the Schöck Isokorb® XT type A varies depending on the width of the parapet. As only ribbed reinforcement steels are used for reinforcement of the parapet in the area of the Schöck Isokorb®, there is no risk of corrosion. Therefore also with an exposure class XC4 a concrete cover in the area of the Schöck Isokorb® XT type A of CV = 25 mm is sufficient.

Schöck Isokorb® XT type A		MM1, MM2
Concrete cover with		CV [mm]
Isokorb® width [mm]	160	30
	170	35
	180	40
	190	45
	200	30
	210	35
	220	40
	230	45
	240	50
	250	55
	260	55

On-site reinforcement

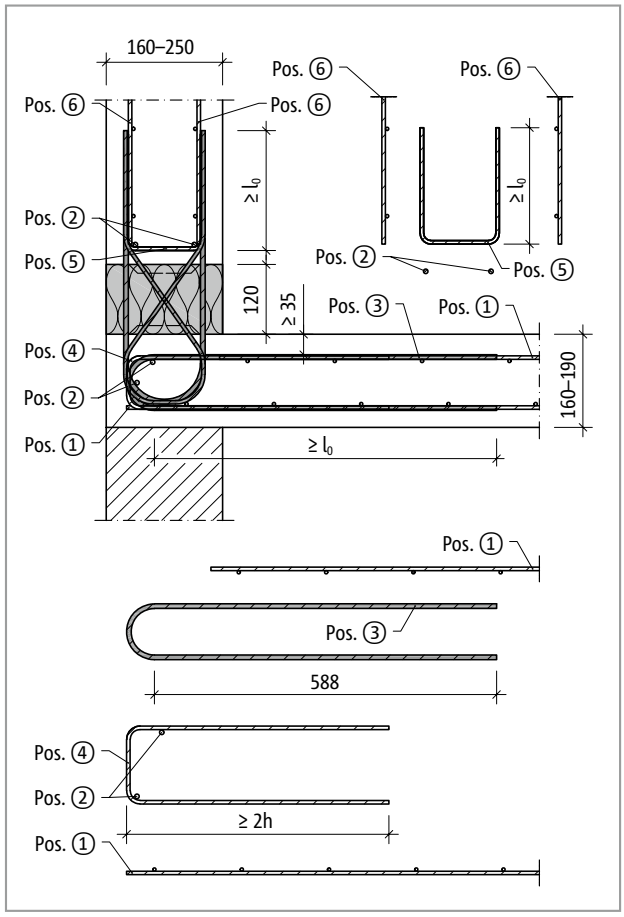


Fig. 268: Schöck Isokorb® XT type A: On-site reinforcement inside

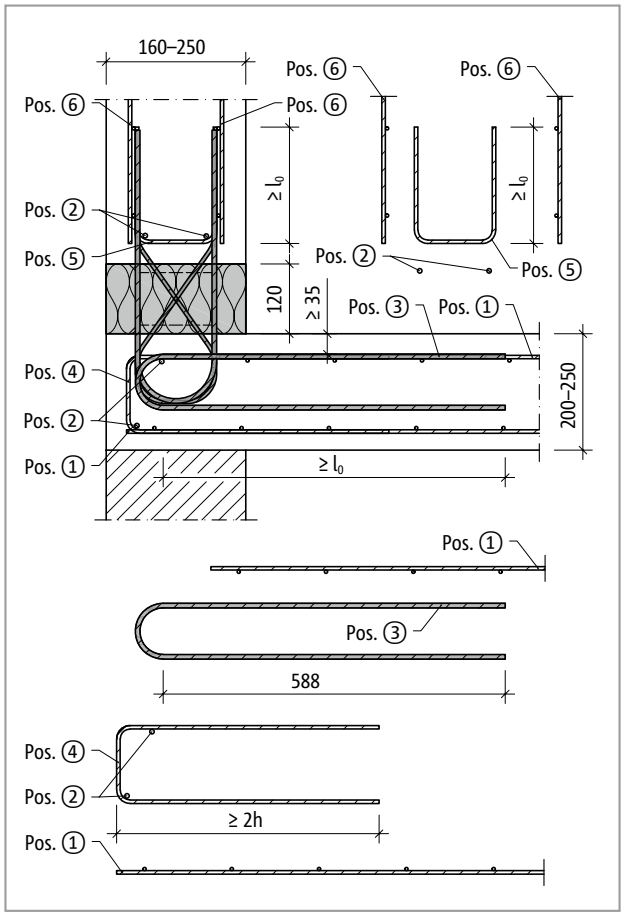


Fig. 269: Schöck Isokorb® XT type A: On-site reinforcement outside

The reinforcement of the reinforced concrete slab is determined from the structural engineer's design. With this the effective moment, the effective normal force and the effective shear force should be taken into account.
In addition, it is to be ensured that the tension bars of the Schöck Isokorb® are 100% lapped. The existing floor reinforcement can be taken into account so far as the maximum separation to the tension bars of 4⌀ is maintained. Additional reinforcement may be required.

On-site reinforcement

Recommendation for the on-site connection reinforcement

Details of the on-site reinforcement for Schöck Isokorb® with a loading of 100% of the maximum design moment and of the shear force with C25/30. The required reinforcement cross-section depends on the bar diameter of the steel bar or wire mesh reinforcement.

Schöck Isokorb® XT type A		MM1	MM2
On-site reinforcement	Location	Concrete strength class ≥ C25/30	
Overlapping reinforcement			
Pos. 1 with H8 [mm²/element]	Floor side	68	172
Pos. 1 with H10 [mm²/element]		68	172
Pos. 1 with H12 [mm²/element]		77	196
Lap length l_0 [mm]		588	588
Steel bars along the insulation joint			
Pos. 2	floor side/parapet side	4 • H8	4 • H8
Factory supplied connection stirrup			
Pos. 3	Floor side	2 · H8	4 · H8
Supplementary edge reinforcement			
Pos. 4	Floor side	2 • H6	2 • H6
Stirrup as suspension reinforcement			
Pos. 5	balustrade side	2 • H6	2 • H6
Lap length l_0 [mm]		200	332
Overlapping reinforcement			
Pos. 6 [mm²/Element]	balustrade side	68	151
Lap length l_0 [mm]		200	332

Information about on-site reinforcement

- Alternative connection reinforcements are possible. The rules as per BS EN 1992-1-1 (EC2) and BS EN 1992-1-1/NA apply for the determination of the lap length. A reduction of the required lap length with m_{Ed}/m_{Rd} is permitted.
- For the reinforcing steel connection stirrups supplied ex works, the upper concrete cover c_v in the floor slab is to be selected dependent on the exposure class.
- For the Schöck Isokorb® widths B=160, 200 the concrete cover is CV ≤ 35 mm. The on-site reinforcement is therefore to be arranged within the tension / compression bars.
- The indicative minimum concrete strength class of the external structural component is C32/40.

Design example

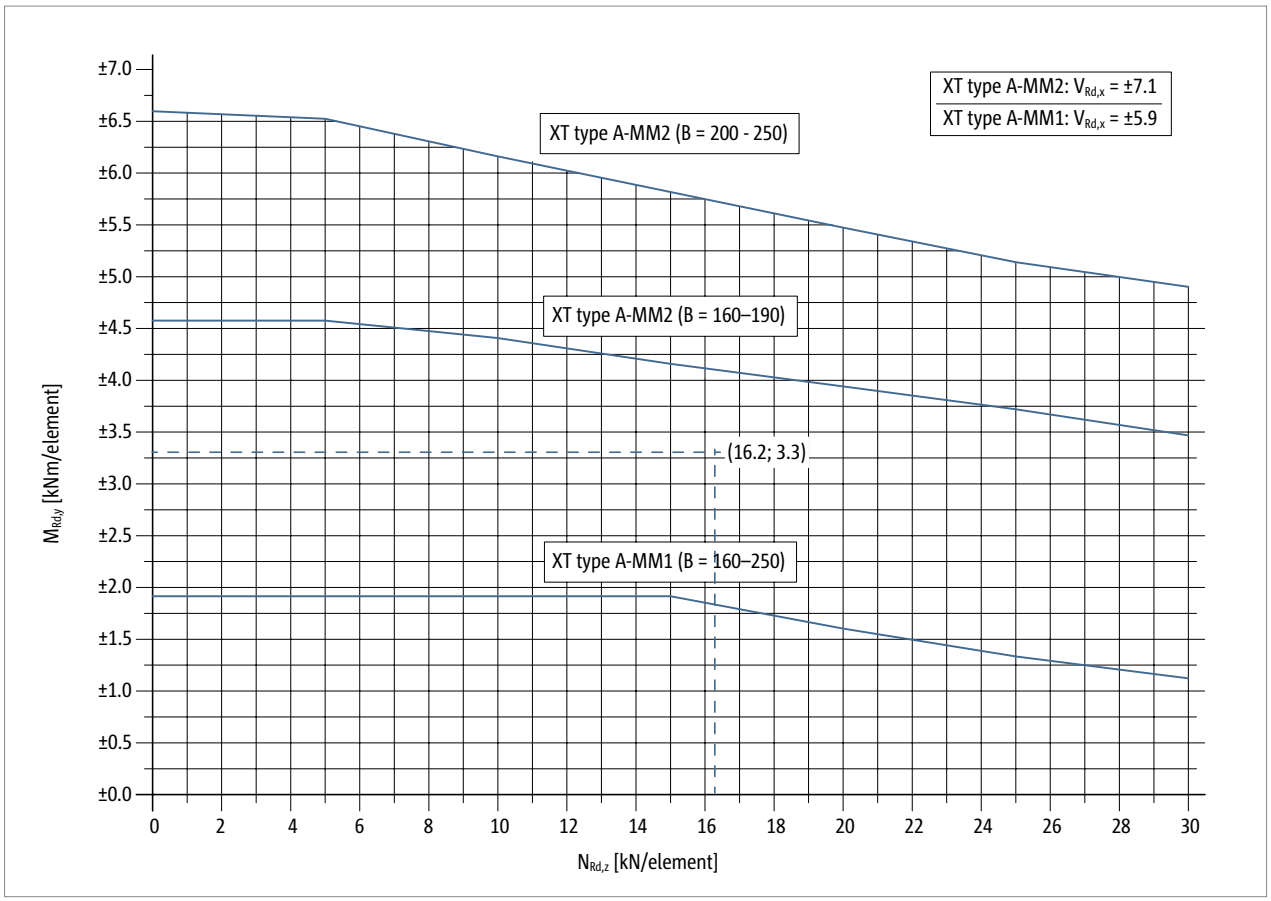
Design example

Given:	Concrete floor		C25/30
	Concrete parapet		C25/30
Parapet	B	= 200 mm	
	h_B	= 1.00 m	
Loading:			
Dead Load and extension	g_k	= 6 kN/m	
Wind	w_k	= 0.8 kN/m²	
Tie bar load	q_k	= 1.0 kN/m	
Selected:	Schöck Isokorb® XT type A-MM2 B = 200 mm		
	Separation a_{prov} = 2.00 m		
Impact per Schöck Isokorb®			
	$N_{Ed,z}$	$= \gamma_G \cdot g_k \cdot a_{prov}$	
	$N_{Ed,z}$	$= 1.35 \cdot 6$ kN/m $\cdot$ 2.00 m = 16.2 kN	
	$v_{Ed,x}$	$= -(\gamma_Q \cdot w_k \cdot h_B + \gamma_Q \cdot \psi_0 \cdot q_k) \cdot a_{prov}$	
	$v_{Ed,x}$	$= -(1.5 \cdot 0.8$ kN/m² $\cdot 1.00$ m $+ 1.5 \cdot 0.7 \cdot 1.0$ kN/m$) \cdot 2.0$ m $= -4.5$ kN	
	$m_{Ed,y}$	$= (\gamma_Q \cdot w_k \cdot h^2_B/2 + \gamma_Q \cdot \psi_0 \cdot q_k \cdot h_B) \cdot a_{prov}$	
	$m_{Ed,y}$	$= (1.5 \cdot 0.8$ kN/m² $\cdot 1.0$ m²$/2 + 1.5 \cdot 0.7 \cdot 1.0$ kN/m $\cdot 1.0$ m$) \cdot 2.0$ m $= 3.3$ kNm	

Note: A design variant is sufficient for the verification with selected or predetermined separation. Alternatively the verification of the maximum centre distances suffices page 176.

Design example

Design variant A
Design diagram



The point ($N_{Ed,z}$; $M_{Ed,y}$) = (16.2 kN; 3.3 kNm) lies below the line of the Schöck Isokorb® XT type A-MM2 (B = 200 - 250).
Thus the verification is provided.

Shear force load-bearing capacity $V_{Rd,x}$ = - 7.1 kN

⇒ $V_{Ed,x}$ = -4.5 kN ≤ $V_{Rd,x}$ = - 7.1 kN → NW o.k. ✓

Design variant B

Interaction table $M_{Rd,y}$ = ± 5.49 kNm for $N_{Rd,z}$ = 20 kN

⇒ $M_{Ed,y}$ = 3.3 kNm ≤ $M_{Rd,y}$ = ± 5.49 kNm → NW o.k. ✓

$N_{Ed,z}$ = 16.2 kN ≤ $N_{Rd,z}$ = 20 kN → NW o.k. ✓

Shear force load-bearing capacity $V_{Rd,x}$ = - 7.1 kN

⇒ $V_{Ed,x}$ = - 4.5 kN ≤ $V_{Rd,x}$ = - 7.1 kN → NW o.k. ✓

Schöck Combar® erection support for precast elements

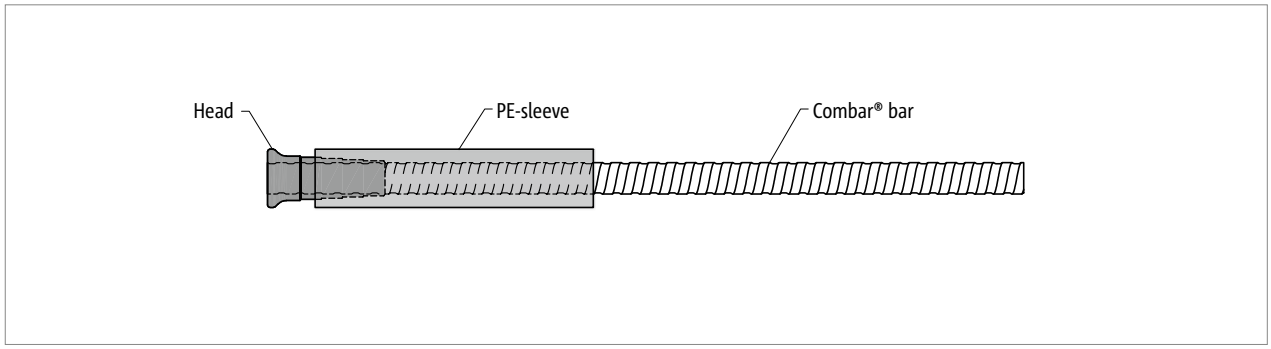


Fig. 270: Schöck Combar® erection support for precast elements: Combar® single-headed bar with sleeve

Schöck Combar® precast -												
Placement with	Bar length [mm]											
Diameter [mm]												

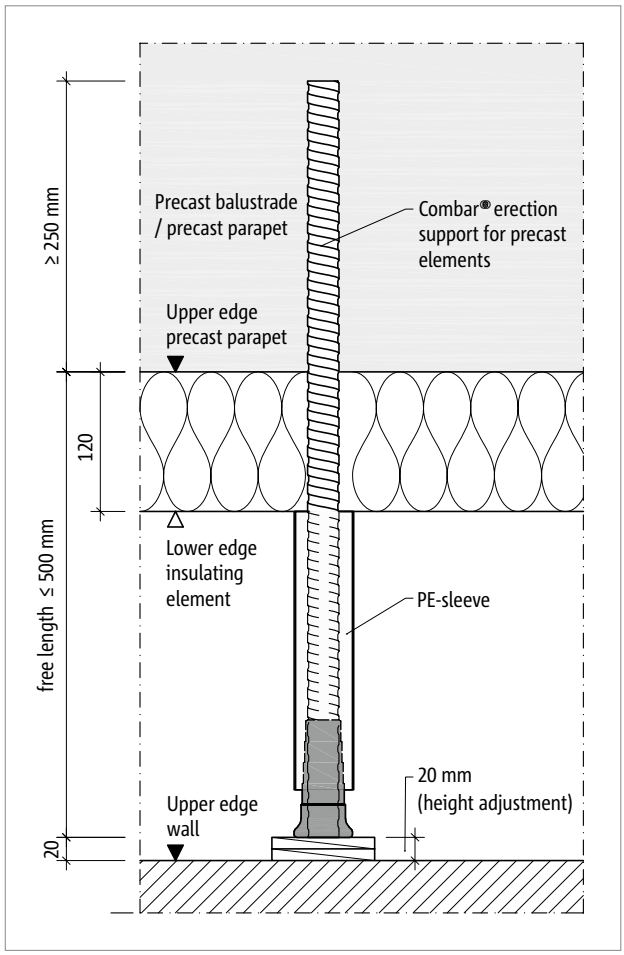


Fig. 271: Schöck Combar® erection support for precast elements: planning dimensions

Schöck Combar® erection support for precast elements

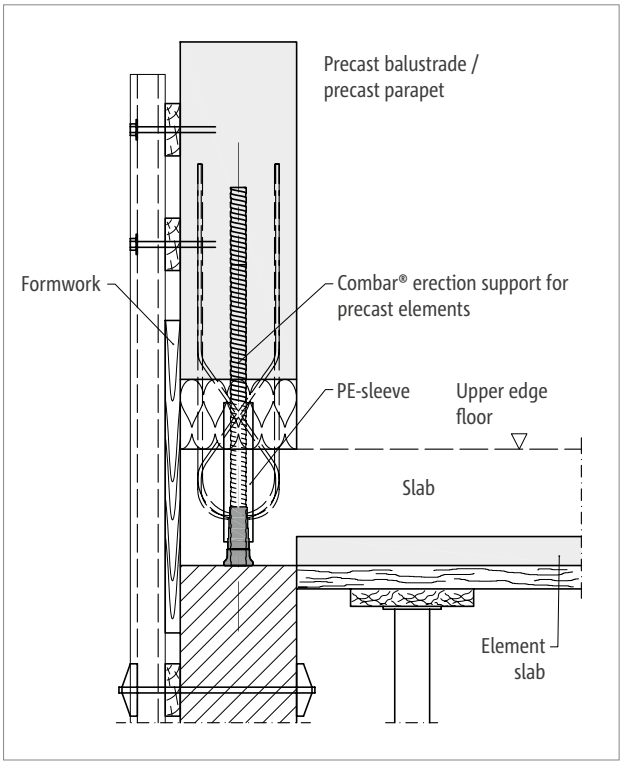


Fig. 272: Schöck Combar® erection support for precast elements: Installation in a precast concrete parapet; section

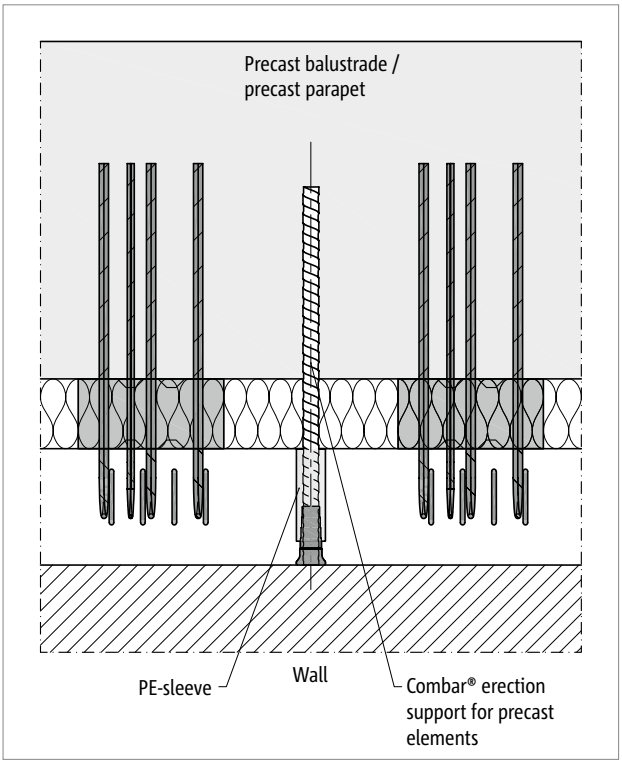


Fig. 273: Schöck Combar® erection support for precast elements: Installation in a precast concrete parapet; view

Product

- The Schöck Combar® erection support for precast elements, in the structural condition can only accept the given load in the short-term.
- The Schöck Combar® erection support for precast elements is to be used only in conjunction with the Schöck Isokorb® XT type A and for all fire protection classes.
- The sleeve is structurally necessary and is concreted into the floor (avoidance of constraint between precast part and floor).

Area of application

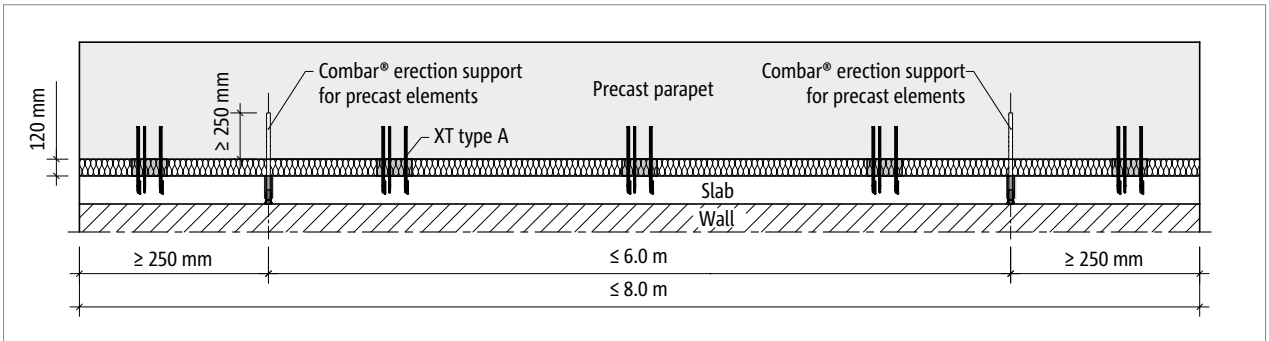


Fig. 274: Schöck Isokorb® XT type A with Combar® erection support for precast elements: Edge distance and minimum bond length in the prefabricated parapet

Precast concrete balustrades/precast concrete parapets

- Total weight ≤ 60 kN (30 kN/Schöck Combar® erection support for precast elements)
- Overall length ≤ 8.0 m
- Thickness ≥ 150 mm
- Concrete strength class ≥ C25/30
- Reinforcement inside and outside
- Number of Schöck Combar® erection support for precast elements per precast concrete part ≤ 2

Schöck Combar® erection support for precast elements | Installation instructions

Installation precast concrete balustrade/precast concrete parapet

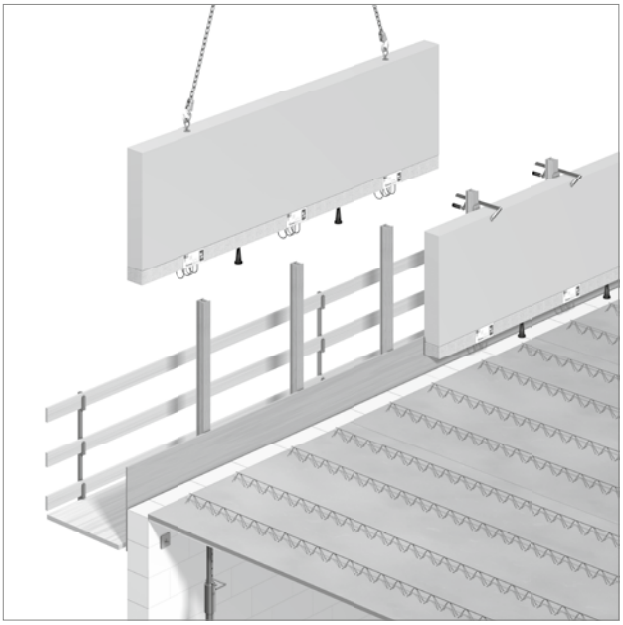


Fig. 275: Schöck Isokorb® XT type A with Combar® erection support for precast elements: Hoisting of the prefabricated attic

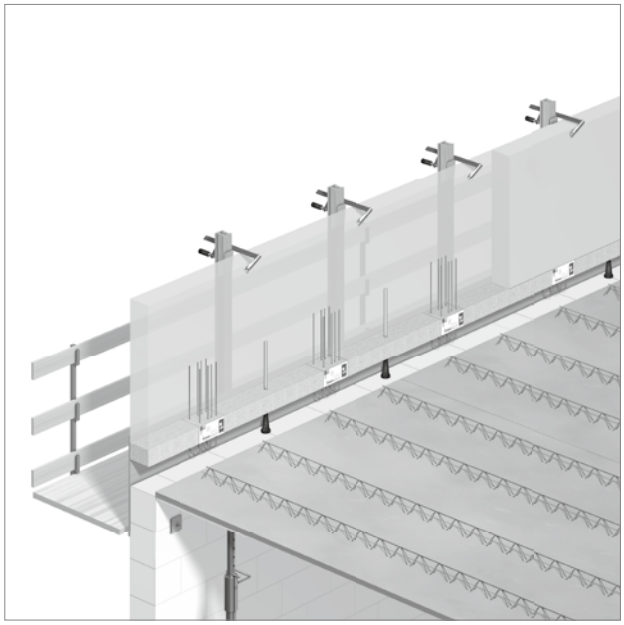


Fig. 276: Schöck Isokorb® XT type A with Combar® erection support for precast elements: Securing of the aligned precast concrete parapet

Installation

- The sleeve is part of the product.
- Mount parapet.
- Place parapet at the installation point and adjust height using adjustment shims.
- Secure using c-clamps.
- Install connection stirrups.

Installation instructions

The current installation instruction can be found online under:
www.schoeck.com/view/5155

☑ Check list

- ☐ Have the loads on the Schöck Isokorb® connection been specified at design level?
- ☐ Has the maximum separation of the outermost Schöck Isokorb® types as a result of expansion in the outer structural components been maintained?
- ☐ Have the requirements for on-site reinforcement of connections been defined in each case?
- ☐ Are the requirements with regard to fire protection explained and is the appropriate addendum entered in the Isokorb® type description in the implementation plans?