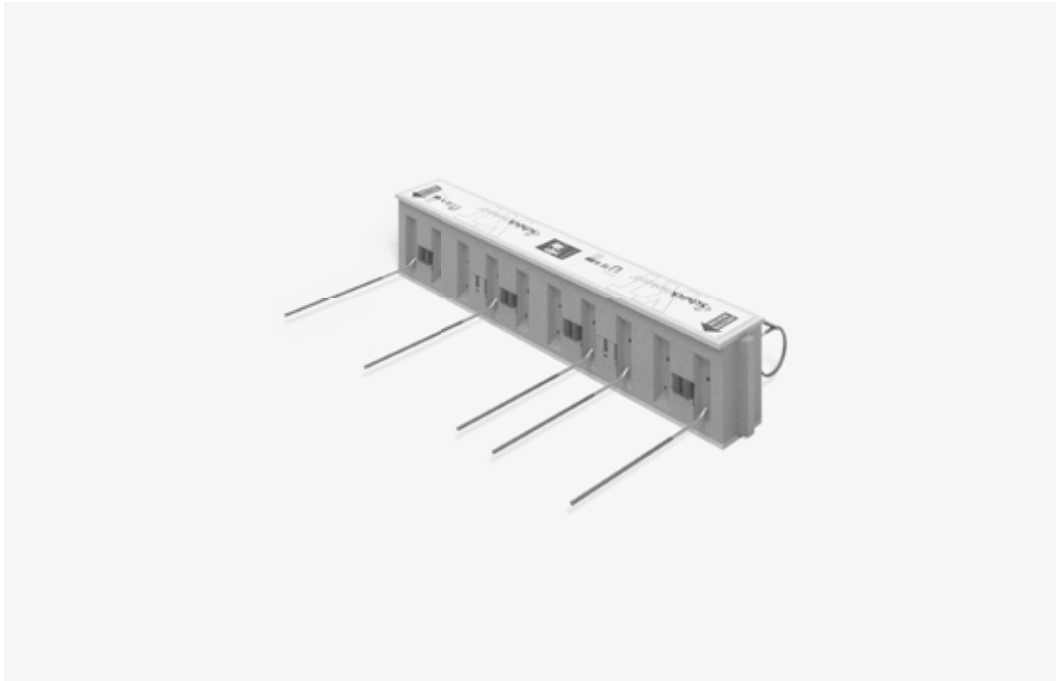


## Schöck Isokorb® XT type Q, Q-VV, Q-Z



### Schöck Isokorb® XT type Q

Suitable for supported balconies. It transfers positive shear forces.

### Schöck Isokorb® XT type Q-VV

Suitable for supported balconies. It transfers positive and negative shear forces.

### Schöck Isokorb® XT type Q-Z

Suitable for supported balconies with connection free of constraint forces. It transfers positive shear forces.



## Element arrangement

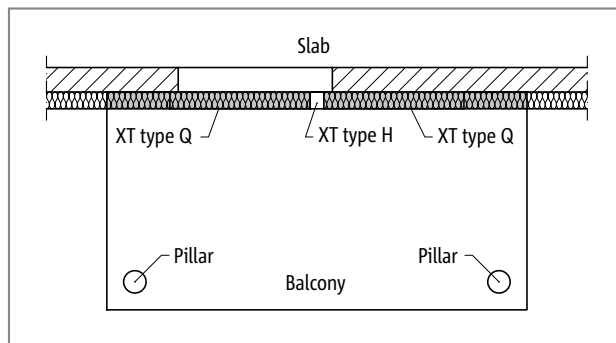


Fig. 119: Schöck Isokorb® XT type Q: Balcony with column support

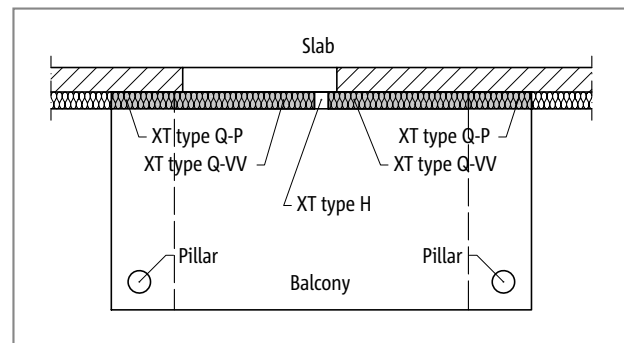


Fig. 120: Schöck Isokorb® XT type Q-P, Q-VV: Balcony with pillar support with different support stiffnesses; optionally with XT type H for the transmission of planned horizontal force

## Installation cross sections

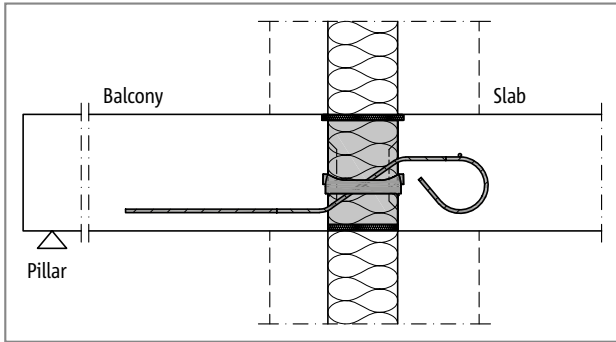


Fig. 121: Schöck Isokorb® XT type Q: Connection with non-load-bearing double wall masonry (XT type Q-V1 to V4)

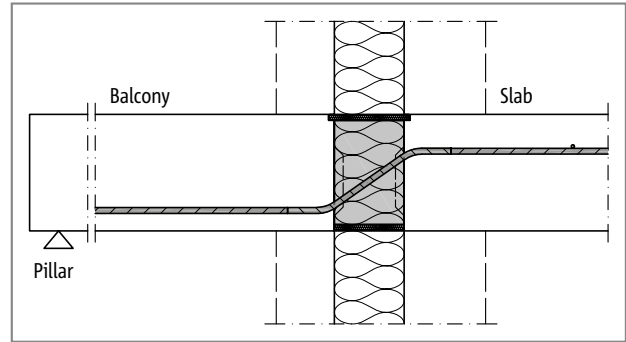


Fig. 122: Schöck Isokorb® XT type Q: Connection with non-load-bearing double wall masonry (XT type Q-V5 to V8)

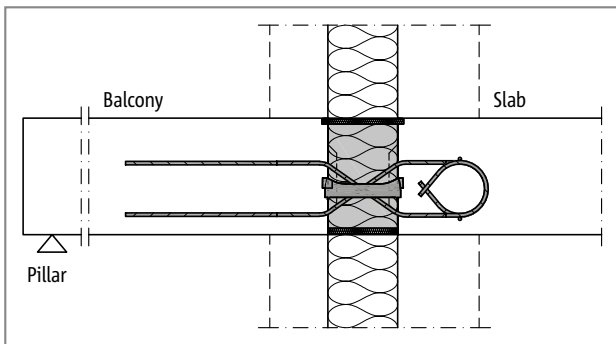


Fig. 123: Schöck Isokorb® XT Type Q: Connection with non-load-bearing cavity masonry

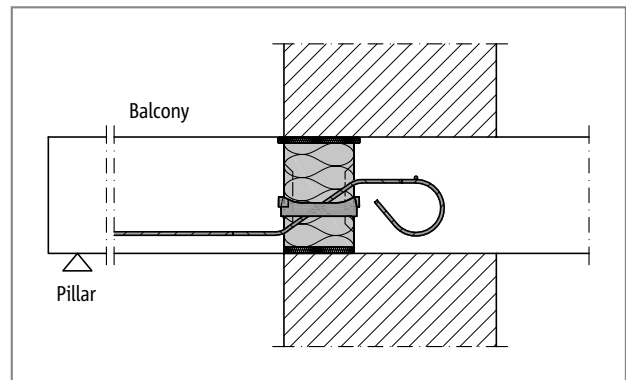


Fig. 124: Schöck Isokorb® XT type Q: Connection with single wall, thermally insulating masonry (XT type Q-V1 to V4)

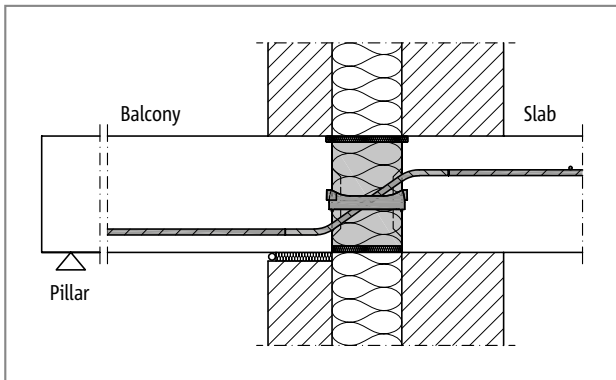


Fig. 125: Schöck Isokorb® XT type Q: Connection with double wall masonry with core insulation (XT type Q-V5 to V8)

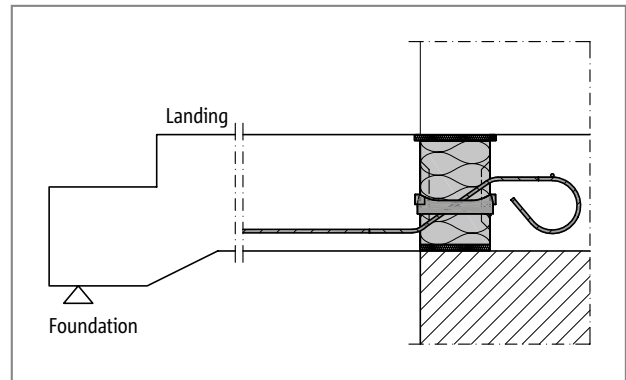


Fig. 126: Schöck Isokorb® XT type Q: Connection stair landing with single wall thermally insulating masonry (XT type Q-V1 to V4)

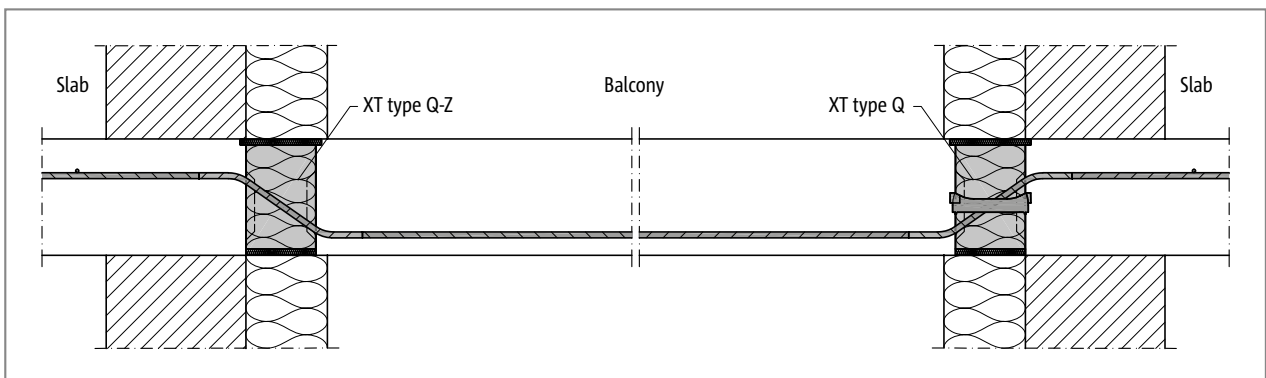


Fig. 127: Schöck Isokorb® XT type Q, Q-Z: Application case single direction tensioned reinforced concrete slab

## Product selection | Type designations | Special designs

### Schöck Isokorb® XT type Q, Q-VV, Q-Z variants

The configuration of the Schöck Isokorb® XT types Q, Q-VV, Q-Z can vary as follows:

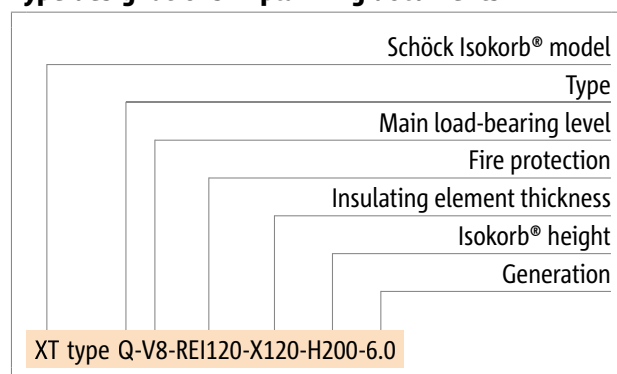
XT type Q: Shear force bar for positive shear force

XT type Q-VV: Shear force bar for positive and negative shear force

XT type Q-Z: Constraint-free without pressure bearing, shear force bar for positive shear force

- ▶ Main load-bearing level:
  - V1 to V8
  - VV1 to VV8
  - Main load-bearing levels V1 to V4: Shear force bar on floor side bent, balcony side straight.
  - Main load-bearing levels V5 to V8: Shear force bar on floor side straight, balcony side straight.
- ▶ Fire resistance class:
  - REI120 (Standard): Projection upper fire protection board, both sides 10 mm
- ▶ Concrete cover of the shear force bars:
  - Below:  $CV \geq 30$  mm
  - Above:  $CV \geq 27$  mm (depending on height of shear force bars)
- ▶ Insulating element thickness:
  - X120 = 120 mm
- ▶ Isokorb® height:
  - $H = H_{\min}$  to 250 mm (take into account minimum slab height depending on load-bearing level and fire protection)
- ▶ Generation:
  - 6.0

### Type designations in planning documents



### **i** 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).

In accordance with approval heights up to 500 mm are possible.

This also applies with additional requirements as a result of precast concrete construction. For additional requirements determined by manufacturing or transportation there are solutions available with coupler bars.

## C25/30 design

Schöck Isokorb® XT type Q	V1	V2	V3	V4	V5	V6	V7	V8
Design values with	$v_{Rd,z}$ [kN/m]							
Concrete C25/30	35.3	42.3	56.4	70.5	87.7	97.9	117.5	137.1

Isokorb® length [mm]	1000	1000	1000	1000	1000	1000	1000	1000
Shear force bars	5 $\varnothing$ 6	6 $\varnothing$ 6	8 $\varnothing$ 6	10 $\varnothing$ 6	7 $\varnothing$ 8	5 $\varnothing$ 10	6 $\varnothing$ 10	7 $\varnothing$ 10
Pressure bearing (piece)	4	4	4	4	4	4	5	6
$H_{min}$ width REI120 [mm]	160	160	160	160	170	180	180	180

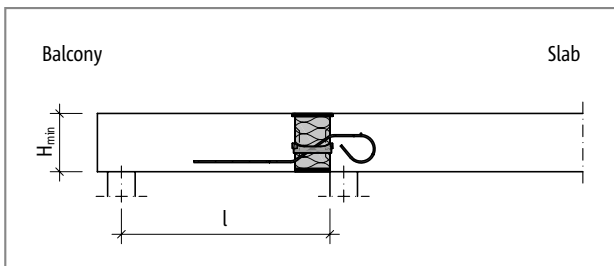


Fig. 128: Schöck Isokorb® XT type Q: Static system (XT type Q-V1 to V4)

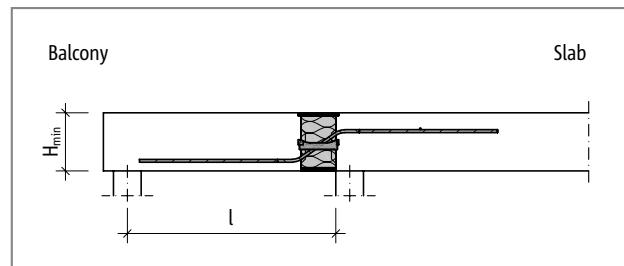


Fig. 129: Schöck Isokorb® XT type Q: Static system (XT type Q-V5 to V8)

Schöck Isokorb® XT type Q-Z	V1	V2	V3	V4	V5	V6	V7	V8
Design values with	$v_{Rd,z}$ [kN/m]							
Concrete C25/30	35.3	42.3	56.4	70.5	87.7	97.9	117.5	137.1

Isokorb® length [mm]	1000	1000	1000	1000	1000	1000	1000	1000
Shear force bars	5 $\varnothing$ 6	6 $\varnothing$ 6	8 $\varnothing$ 6	10 $\varnothing$ 6	7 $\varnothing$ 8	5 $\varnothing$ 10	6 $\varnothing$ 10	7 $\varnothing$ 10
Pressure bearing (piece)	-	-	-	-	-	-	-	-
$H_{min}$ width REI120 [mm]	160	160	160	160	170	180	180	180

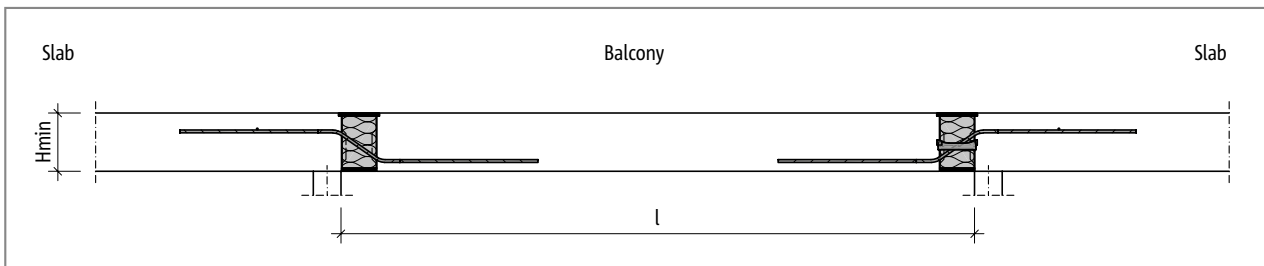


Fig. 130: Schöck Isokorb® XT type Q-Z, Q: Static system (XT type Q-Z-V5 to Q-Z-V8, Q-V5 to Q-V8)

## C25/30 design

Schöck Isokorb® XT type Q	VV1	VV2	VV3	VV4
Design values with	$v_{Rd,z}$ [kN/m]			
Concrete C25/30	±35.3	±42.3	±56.4	±70.5

Isokorb® length [mm]	1000	1000	1000	1000
Shear force bars	5 $\varnothing$ 6 + 5 $\varnothing$ 6	6 $\varnothing$ 6 + 6 $\varnothing$ 6	8 $\varnothing$ 6 + 8 $\varnothing$ 6	10 $\varnothing$ 6 + 10 $\varnothing$ 6
Pressure bearing (piece)	4	4	4	4
H <sub>min</sub> width REI120 [mm]	160	160	160	160

Schöck Isokorb® XT type Q	VV5	VV6	VV7	VV8
Design values with	$v_{Rd,z}$ [kN/m]			
Concrete C25/30	±87.8	±97.9	±117.5	±137.1

Isokorb® length [mm]	1000	1000	1000	1000
Shear force bars	7 $\varnothing$ 8 + 7 $\varnothing$ 8	5 $\varnothing$ 10 + 5 $\varnothing$ 10	6 $\varnothing$ 10 + 6 $\varnothing$ 10	7 $\varnothing$ 10 + 7 $\varnothing$ 10
Pressure bearing (piece)	4	4	5	6
H <sub>min</sub> width REI120 [mm]	170	180	180	180

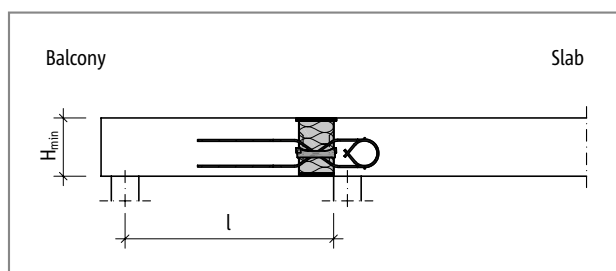


Fig. 131: Schöck Isokorb® XT type Q-VV: Static system (XT type Q-VV1 to VV4)

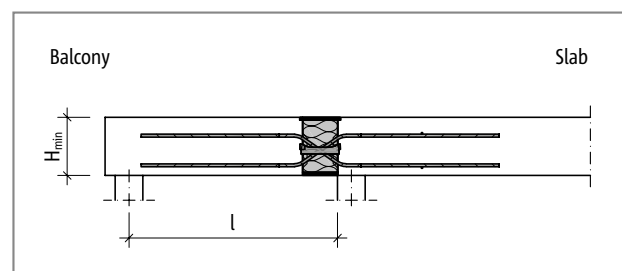


Fig. 132: Schöck Isokorb® XT type Q-VV: Static system (XT type Q-VV5 to VV8)

### **i** Notes on design

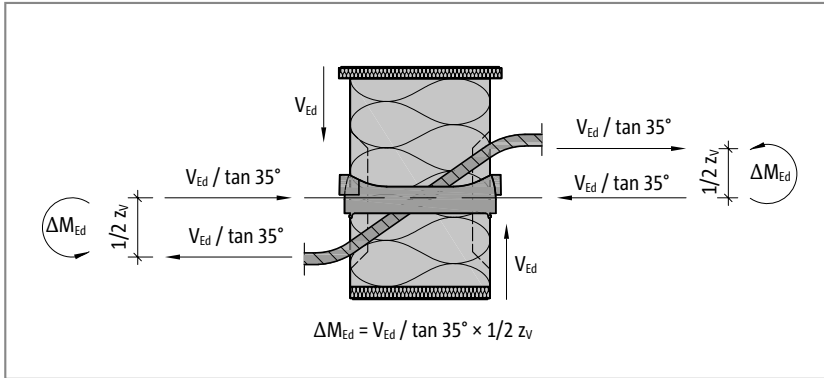
- ▶ The shear force loading of the slabs in the area of the insulation joint is to be limited to  $V_{Rd,max}$ , whereby  $V_{Rd,max}$ , acc. to BS EN 1992-1-1 (EC2), Exp. (6.9) is determined for  $\theta = 45^\circ$  and  $\alpha = 90^\circ$  (slab load-bearing capacity).
- ▶ A structural analysis is to be produced for the reinforced concrete structural components adjacent on both sides of the Schöck Isokorb®. With a connection using Schöck Isokorb® XT type Q as static system, a freely rotating support (pin connection) is to be adopted.
- ▶ Additional Schöck Isokorb® XT type H are required for the transmission of scheduled horizontal forces.
- ▶ Due to the eccentric force application of the Schöck Isokorb® XT type Q and XT type Q-VV, an offset moment results on the adjacent slab edge. This is to be taken into account with the design of the slabs.
- ▶ The Schöck Isokorb® XT type Q-VV is also available as XT type Q-Z-VV variant.
- ▶ With different concrete strength classes (e.g. balcony C32/40, inner slab C25/30) basically the weaker concrete is relevant for the design of the Schöck Isokorb®.
- ▶ The indicative minimum concrete strength class of the external structural component is C32/40.

## Moments from excentric connection

### Moments from excentric connection

Moments from excentric connection are to be taken into account for the design of the reinforcement connection on both sides of the shear force transferring Schöck Isokorb® XT types Q and Q-VV . These moments are to be respectively overlaid with the moments from the ordinary loading if they have the same sign.

The following table values  $\Delta M_{Ed}$  have been calculated with 100% utilisation of  $v_{Rd}$ .



Schöck Isokorb® XT type Q	V1, VV1	V2, VV2	V3, VV3	V4, VV4
Design values with	$\Delta M_{Ed}$ [kNm/m]			
Concrete C25/30	2.2	2.7	3.6	4.5

Schöck Isokorb® XT type Q	V5, VV5	V6, VV6	V7, VV7	V8, VV8
Design values with	$\Delta M_{Ed}$ [kNm/m]			
Concrete C25/30	5.9	7.1	8.6	10.0

XT  
type Q

Reinforced concrete – reinforced concrete



## Expansion joint spacing

### Maximum expansion joint spacing

If the structural element length exceeds the maximum expansion joint spacing  $e$ , expansion joints must be installed in the outer lying concrete structural elements at right angles to the insulation plane, in order to limit the impacts as a result of temperature changes. For fixed points such as corners of balconies, parapets and balustrades or when using the Schöck Isokorb® XT types H, half the maximum expansion joint spacing  $e/2$  applies out from the fixed point.

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

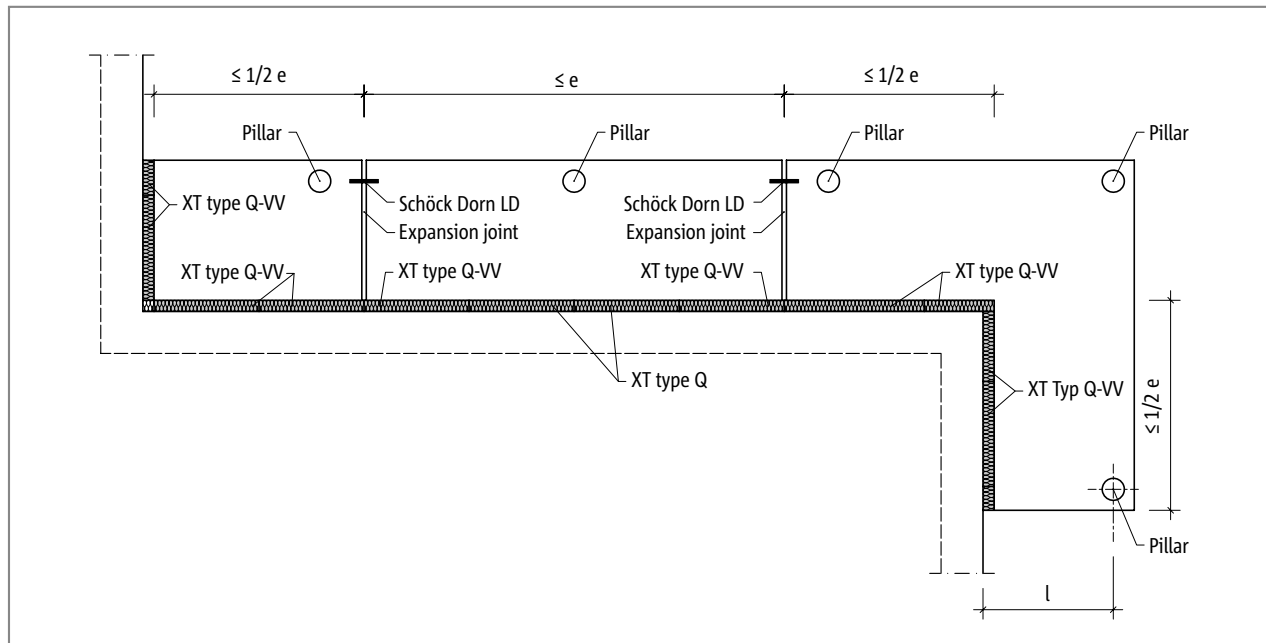


Fig. 133: Schöck Isokorb® XT type Q, Q-VV: Expansion joint arrangement

Schöck Isokorb® XT type Q, Q-Z	V1 - V5 VV1 - VV5	V6 - V8 VV6 - VV8
Maximum expansion joint spacing	$e$ [m]	
Insulating element thickness [mm]	120	23.0
		21.7

### **i** Edge distances

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

- ▶ For the centre distance of the compression elements from the free edge or from the expansion joint:  $e_R \geq 50$  mm applies.
- ▶ For the centre distance of the shear force bars from the free edge or from the expansion joint:  $e_R \geq 100$  mm and  $e_R \leq 150$  mm applies.

## Product description

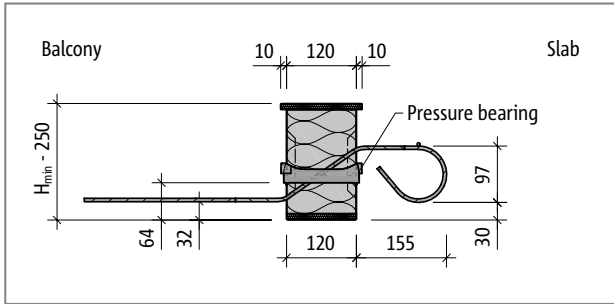


Fig. 134: Schöck Isokorb® XT type Q-V1 to Q-V4: Product section

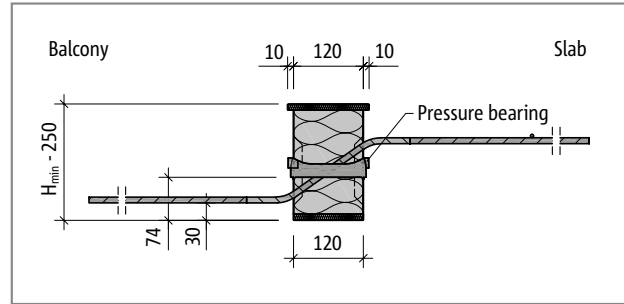


Fig. 135: Schöck Isokorb® XT type Q-V5 to Q-V8: Product section

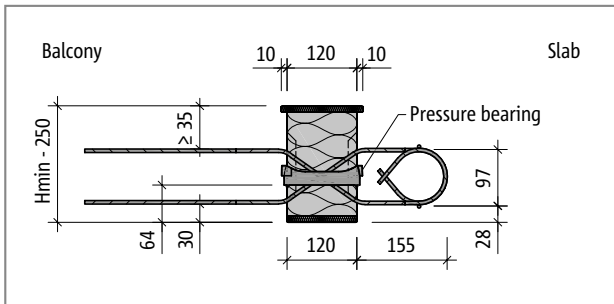


Fig. 136: Schöck Isokorb® XT type Q-VV1 to Q-VV4: Product section

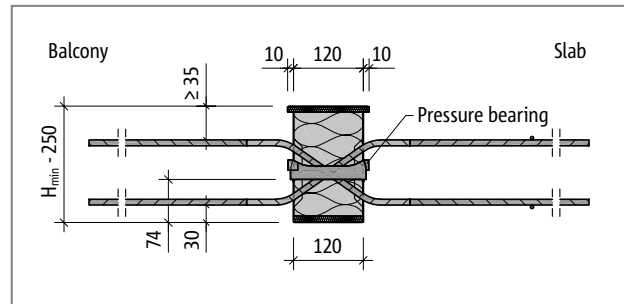


Fig. 137: Schöck Isokorb® XT type Q-VV5 to Q-VV8: Product section

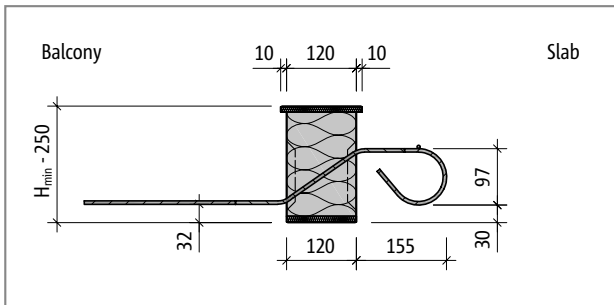


Fig. 138: Schöck Isokorb® XT type Q-Z-V1 to Q-Z-V4: Product section

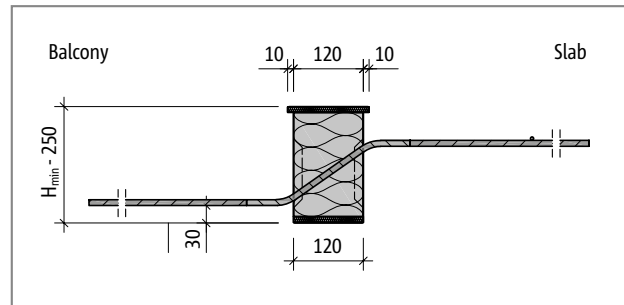


Fig. 139: Schöck Isokorb® XT type Q-Z-V5 to Q-Z-V8: Product section

XT  
type Q

## Product description

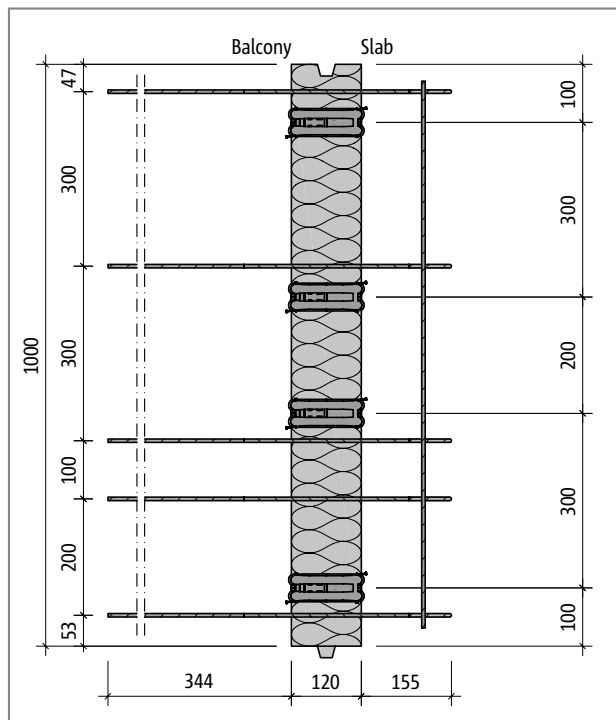


Fig. 140: Schöck Isokorb® XT type Q-V1: Product plan view

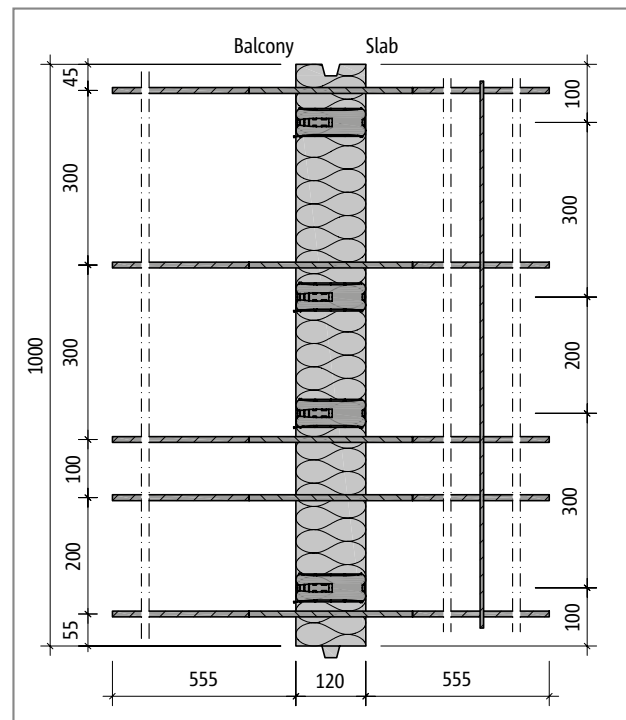


Fig. 141: Schöck Isokorb® XT type Q-V6: Product plan view

### **i** Product information

- ▶ Download further product plan views and cross-sections at [www.schoeck.co.uk/download](http://www.schoeck.co.uk/download)
- ▶ Observe minimum height<sub>min</sub> Schöck Isokorb® XT type Q, Q-VV and Q-Z.

## On-site reinforcement

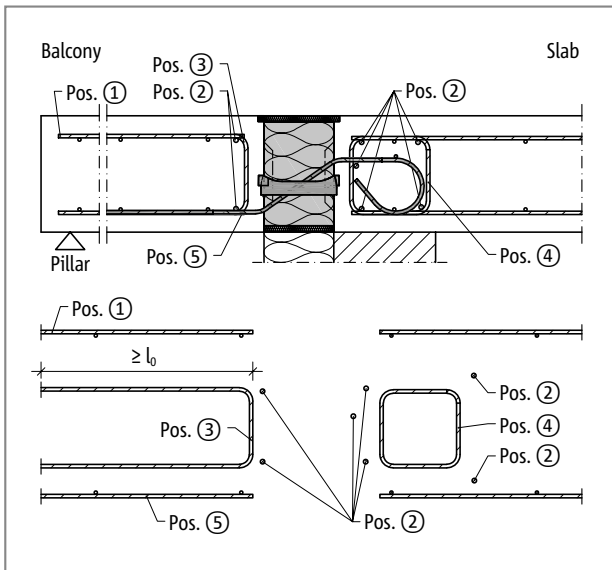


Fig. 142: Schöck Isokorb® XT type Q-V1 to V4: On-site reinforcement

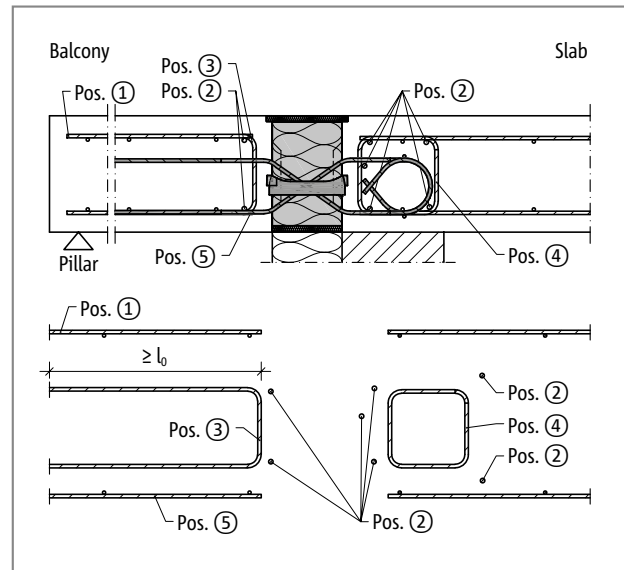


Fig. 143: Schöck Isokorb® XT type Q-VV1 to VV4: On-site reinforcement

The reinforcement in the reinforced concrete slab is determined from the structural engineer's design. With this both the effective moment and the effective shear force should be taken into account.

In addition, it is to be ensured that the shear force bars of the Schöck Isokorb® are 100% lapped, insofar as they lie in the tension zone.

Schöck Isokorb® XT type Q, Q-Z			V1, VV1	V2, VV2	V3, VV3	V4, VV4
On-site reinforcement	Concrete strength	Location	Concrete strength class $\geq$ C25/30			
<b>Pos. 1 Lapping reinforcement</b>						
Pos. 1		Balcony side	acc. to the specifications of the structural engineer			
<b>Pos. 2 Steel bars along the insulation joint</b>						
Pos. 2		Balcony side	2 · H8	2 · H8	2 · H8	2 · H8
Pos. 2		Floor side	5 · H8	5 · H8	5 · H8	5 · H8
<b>Pos. 3 Stirrup</b>						
Pos. 3 [mm <sup>2</sup> /m]	C25/30	Balcony side	81	97	130	162
<b>Pos. 4 Closed stirrup (edge beam according to Z-15.7-240)</b>						
Pos. 4 [mm <sup>2</sup> /m]		Floor side	141	141	141	141
Pos. 4		Floor side	H8@200	H8@200	H8@200	H8@200
<b>Pos. 5 Lapping reinforcement</b>						
Pos. 5		Balcony side	necessary in the tension zone, as specified by the structural engineer			
<b>Pos. 6 Side reinforcement at the free edge</b>						
Pos. 6			Edging as per BS EN 1992-1-1 (EC2), 9.3.1.4 (not pictured)			

### **i** Information about on-site reinforcement

- ▶ Lapping of the reinforcement in the connecting reinforced concrete components must be applied as close as possible to the insulating element of the Schöck Isokorb®, the required concrete cover must be observed.
- ▶ The shear force bars are to be anchored with their straight ends in the pressure zone. In the tension zone the shear force bars are to be lapped.
- ▶ The structural edging Pos. 6 should be selected so low that it can be arranged between the upper and lower reinforcement position.
- ▶ The indicative minimum concrete strength class of the external structural component is C32/40.

## On-site reinforcement

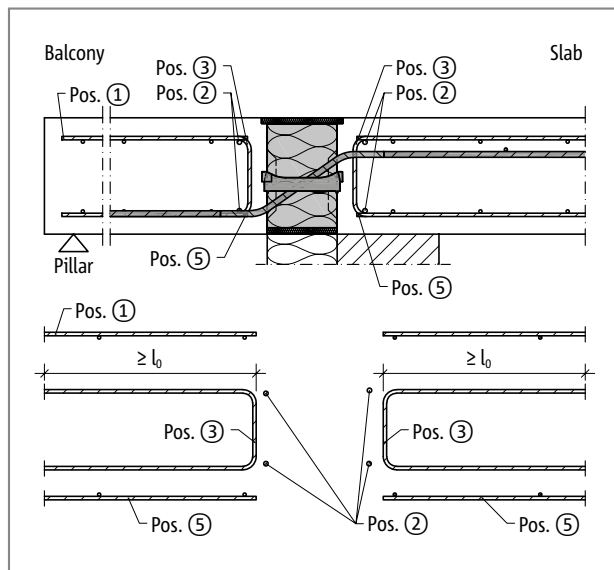


Fig. 144: Schöck Isokorb® XT type Q-V5 to Q-V8: On-site reinforcement

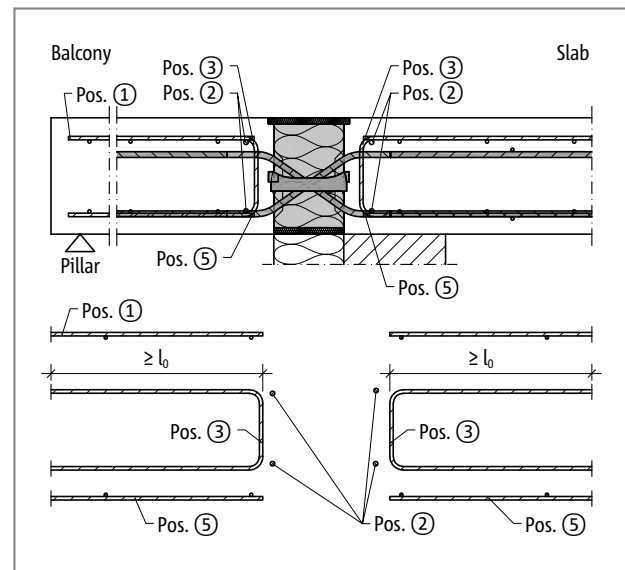


Fig. 145: Schöck Isokorb® XT type Q-VV5 to Q-VV8: On-site reinforcement

The reinforcement in the reinforced concrete slab is determined from the structural engineer's design. With this both the effective moment and the effective shear force should be taken into account.

In addition, it is to be ensured that the shear force bars of the Schöck Isokorb® are 100% lapped, insofar as they lie in the tension zone.

Schöck Isokorb® XT type Q, Q-Z			V5, VV5	V6, VV6	V7, VV7	V8, VV8
On-site reinforcement	Concrete strength	Location	Concrete strength class $\geq$ C25/30			
<b>Pos. 1 Lapping reinforcement</b>						
Pos. 1		Balcony/floor side	acc. to the specifications of the structural engineer			
<b>Pos. 2 Steel bars along the insulation joint</b>						
Pos. 2		Balcony/floor side	2 · 2 · H8	2 · 2 · H8	2 · 2 · H8	2 · 2 · H8
<b>Pos. 3 Stirrup</b>						
Pos. 3 [mm <sup>2</sup> /m]	C25/30	Balcony/floor side	202	225	270	315
<b>Pos. 5 Lapping reinforcement</b>						
Pos. 5		Balcony/floor side	necessary in the tension zone, as specified by the structural engineer			
<b>Pos. 6 Side reinforcement at the free edge</b>						
Pos. 6			Edging as per BS EN 1992-1-1 (EC2), 9.3.1.4 (not pictured)			

### **i** Information about on-site reinforcement

- ▶ Lapping of the reinforcement in the connecting reinforced concrete components must be applied as close as possible to the insulating element of the Schöck Isokorb®, the required concrete cover must be observed.
- ▶ The shear force bars are to be anchored with their straight ends in the pressure zone. In the tension zone the shear force bars are to be lapped.
- ▶ The structural edging Pos. 6 should be selected so low that it can be arranged between the upper and lower reinforcement position.
- ▶ The indicative minimum concrete strength class of the external structural component is C32/40.

## Application example reinforced concrete slab spanning in one direction

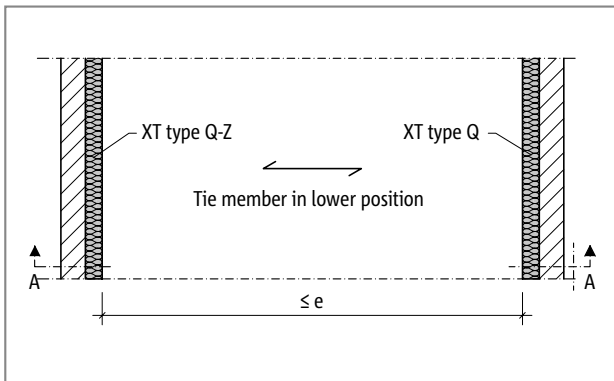


Fig. 146: Schöck Isokorb® XT type Q-Z, Q: One-way spanning reinforced concrete slab

An XT type Q-Z without pressure bearing is to be arranged on one side for support free of constraint. On the opposite side an XT type Q with pressure bearing is then required. In order to maintain the balance of forces a tie member is to reinforce between XT type Q-Z and XT type Q, which overlaps with shear force transmitting Isokorb®-bars.

### **i** Expansion joints

- ▶ Expansion joint spacing  $e$  see page 101

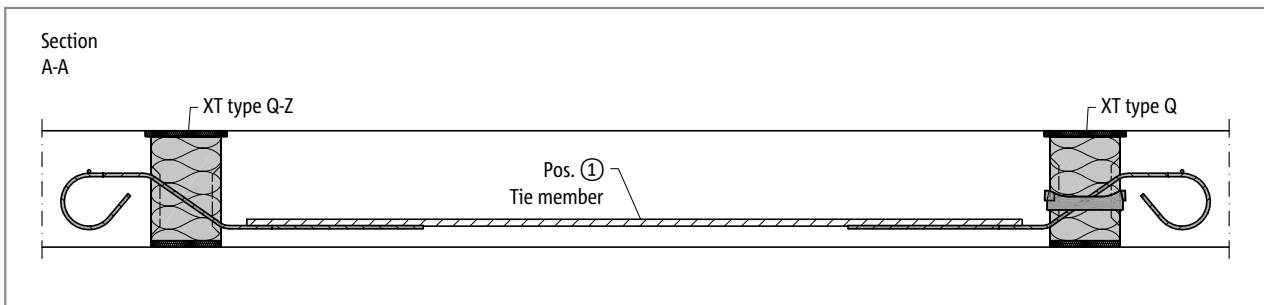


Fig. 147: Schöck Isokorb® XT type Q-Z-V1 to Q-Z-V4, Q-V1 to Q-V4: Section A-A; one direction spanned reinforced concrete slab

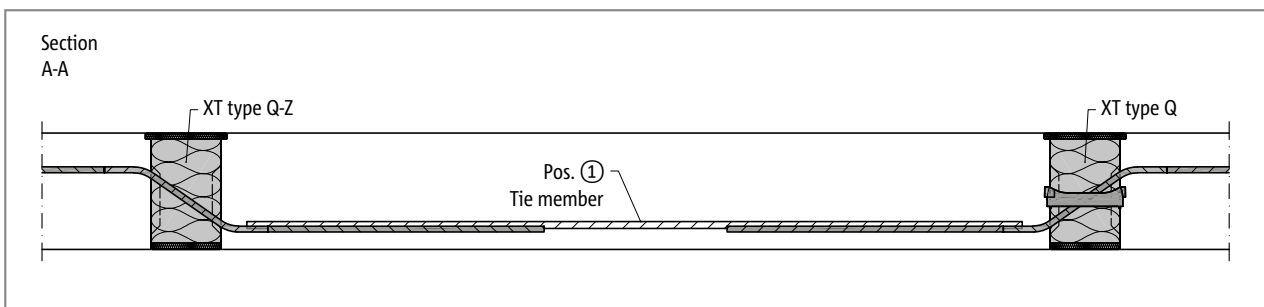


Fig. 148: Schöck Isokorb® XT type Q-Z-V5 to Q-Z-V8, Q-V5 to Q-V8: Section A-A; one direction spanned reinforced concrete slab

Schöck Isokorb® XT type Q, Q-Z	V1	V2	V3	V4	V5	V6	V7	V8
On-site reinforcement	Concrete strength class $\geq$ C25/30							
Pos. 1 Tie								
Pos. 1	5 · H8	6 · H8	8 · H8	10 · H8	7 · H8	5 · H10	6 · H10	7 · H10

### **i** Information about on-site reinforcement

- ▶ The required suspension reinforcement and the on-site slab reinforcement are not shown here.
- ▶ On-site reinforcement analogue to Schöck Isokorb® XT type Q see page 104

## Type of bearing: supported

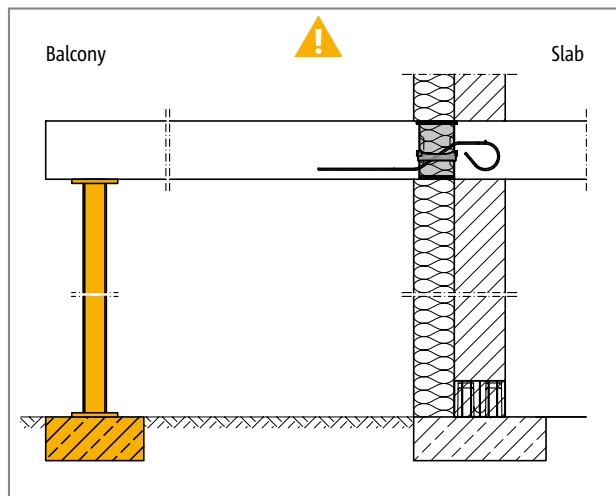


Fig. 149: Schöck Isokorb® XT type Q: Continuous support required

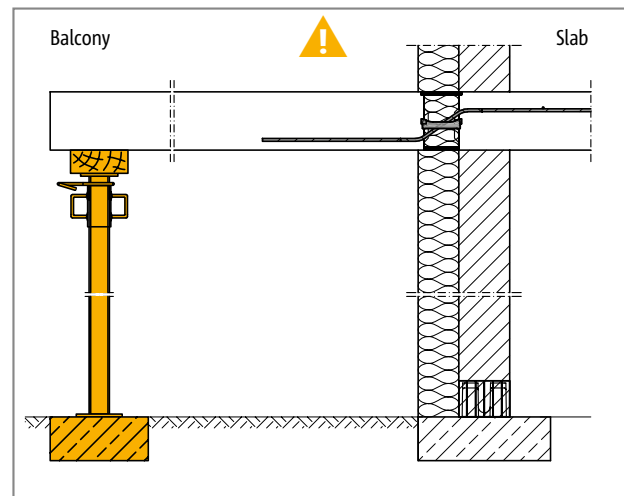


Fig. 150: Schöck Isokorb® XT type Q: Continuous support required

### **i** Supported balcony

The Schöck Isokorb® XT type Q, Q-VV and Q-Z is developed for supported balconies. It transfers exclusively shear forces, no bending moments.

### **!** Warning - omitting the pillars

- ▶ The balcony will collapse if not supported.
- ▶ At all stages of construction, the balcony must be supported with statically suitable pillars or supports.
- ▶ Even when completed, the balcony must be supported with statically suitable pillars or supports.
- ▶ A removal of temporary support is permitted only after installation of the final support.

## ✓ Check list

- Has the Schöck Isokorb® type matching the static system been selected? XT type Q counts as pure shear force connection (pin connection).
- Is the danger notice for missing support entered in the implementation plans?
- Is the balcony so planned that a continuous support is ensured in all stages of construction and in the final status?
- Have the loads on the Schöck Isokorb® connection been specified at design level?
- Has the cantilevered system length or the system support width been taken as a basis?
- Are the Schöck FEM guidelines taken into account with the calculation using FEM?
- With the selection of the design table is the relevant concrete strength class taken into account?
- Is the minimum slab thickness taken into consideration with Schöck Isokorb® types in fire protection configuration?
- Have the requirements for on-site reinforcement of connections been defined in each case?
- Are the maximum allowable expansion joint spacings taken into account?
- Is the required component geometry present with the connection to a floor or a wall? Is a special design required?
- Are the requirements with regard to fire protection explained and is the appropriate addendum entered in the Isokorb® type description in the implementation plans?
- Have existing horizontal loads e.g. from wind pressure, been taken into account as planned? Are additional Schöck Isokorb® XT type H required for this?
- With precast balconies are possibly necessary gaps for the front side transportation anchors and downpipes with internal drainage taken into account? Is the maximum centre distance of 300 mm for the Isokorb® bars observed?
- With 2- or 3-sided support is a Schöck Isokorb® selected for a connection free of constraint selected (possibly XT type Q-Z, XT type Q-PZ)?