Schöck Isokorb® XT type K-U, K-O

Schöck Isokorb® XT type K-U
Suitable for cantilevered balconies with height offset downwards. The balcony lies lower than the floor slab. Suitable for cantilevered balconies, which are connected to a reinforced concrete wall above. It transfers negative moments and positive shear forces.

Schöck Isokorb® XT type K-O
Suitable for cantilevered balconies with height offset upwards. The balcony lies higher than the floor slab. Suitable for cantilevered balconies, which are connected to a reinforced concrete wall below. It transfers negative moments and positive shear forces.

Product change

Old

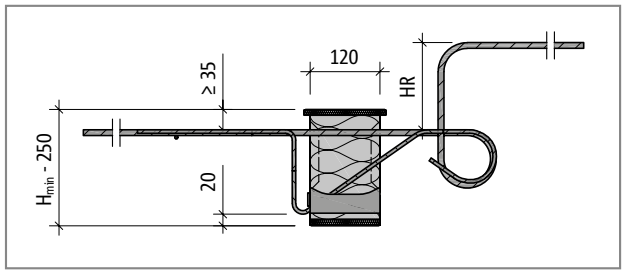


Fig. 78: Schöck Isokorb® XT type K-HV: Product section

New

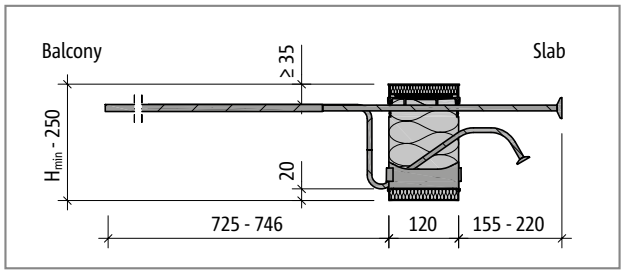


Fig. 79: Schöck Isokorb® XT type K-U: Product section

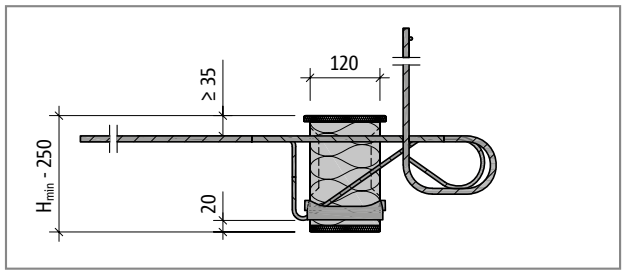


Fig. 80: Schöck Isokorb® XT type K-WO: Product section

Old

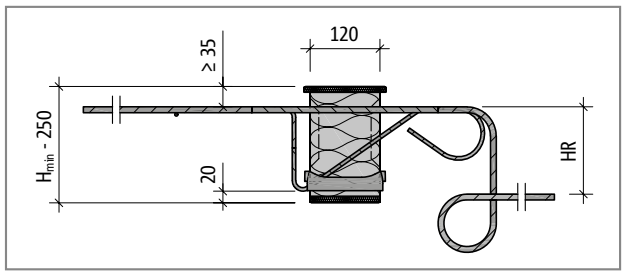


Fig. 81: Schöck Isokorb® XT type K-BH: Product section

New

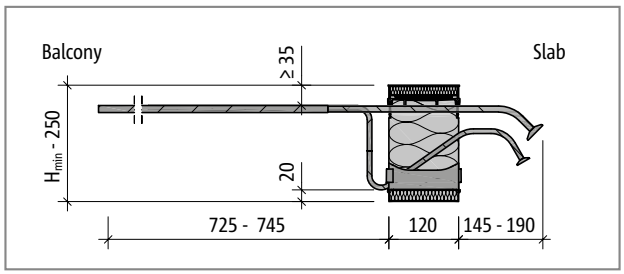


Fig. 82: Schöck Isokorb® XT type K-O: Product section

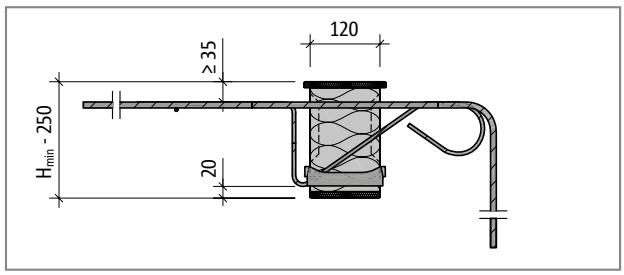


Fig. 83: Schöck Isokorb® XT type K-WU: Product section

Product change

- The Schöck Isokorb® XT type K-HV and the Schöck Isokorb® XT type K-WO are replaced by the Schöck Isokorb® XT type K-U.
- The Schöck Isokorb® XT type K-BH and the Schöck Isokorb® XT type K-WU are replaced by the Schöck Isokorb® XT type K-O.

Balcony with height offset downwards using Schöck Isokorb® XT type K

Height offset $h_V \leq h_D - c_a - d_s - c_i$

If $h_V \leq h_D - c_a - d_s - c_i$ then the Schöck Isokorb® XT type K with straight tension bars can be selected.

Height offset $h_V > h_D - c_a - d_s - c_i$

If the condition $h_V \leq h_D - c_a - d_s - c_i$ is not met, the connection can be implemented using the Schöck Isokorb® XT type K-U.

Recommendation: Downstand beam width at least 220 mm

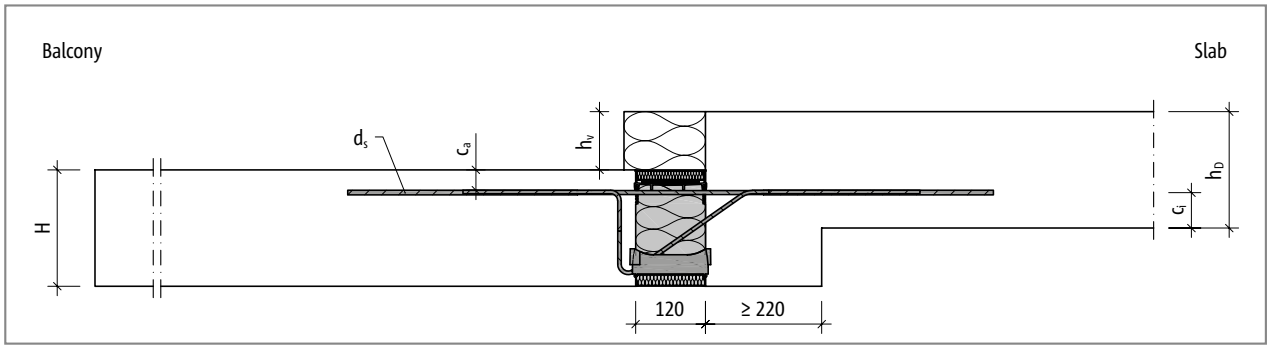


Fig. 84: Schöck Isokorb® XT type K: Small height offset downwards (balcony subjacent)

Height offset $h_V > h_D - c_a - d_s - c_i$

If the condition $h_V \leq h_D - c_a - d_s - c_i$ is not met, the connection can be implemented using Schöck Isokorb® XT type K-U.

Element arrangement | Installation cross sections

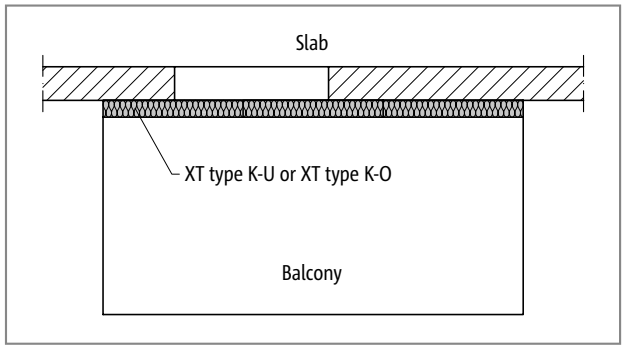


Fig. 85: Schöck Isokorb® XT type K-U/K-O: Cantilevered balcony

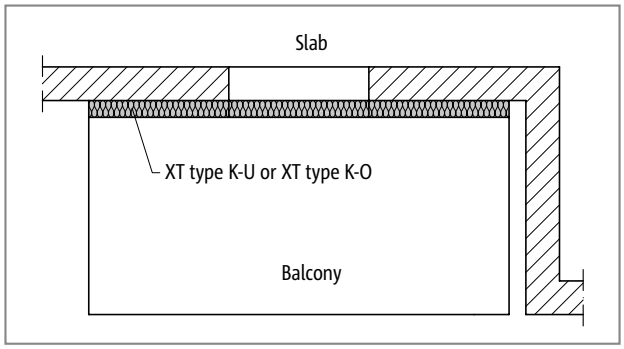


Fig. 86: Schöck Isokorb® XT type K-U/K-O: Balcony with facade offset

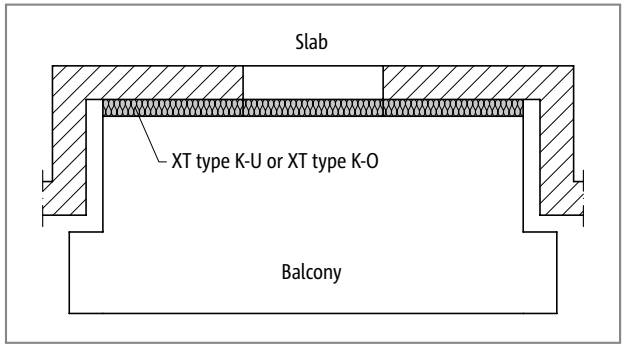


Fig. 87: Schöck Isokorb® XT type K-U/K-O: Balcony with facade offset

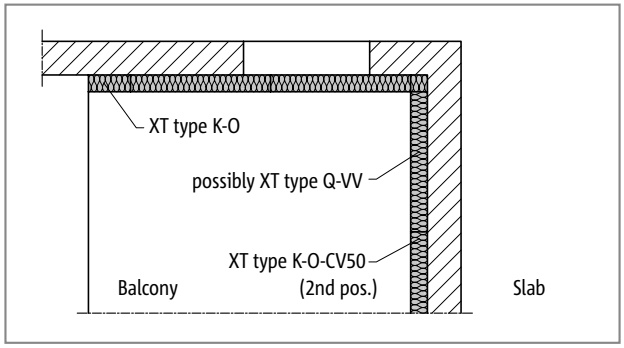


Fig. 88: Schöck Isokorb® XT type K-U/K-O, XT type Q-VV: Balcony with inner corner, supported two-sided

Balcony with height offset upwards

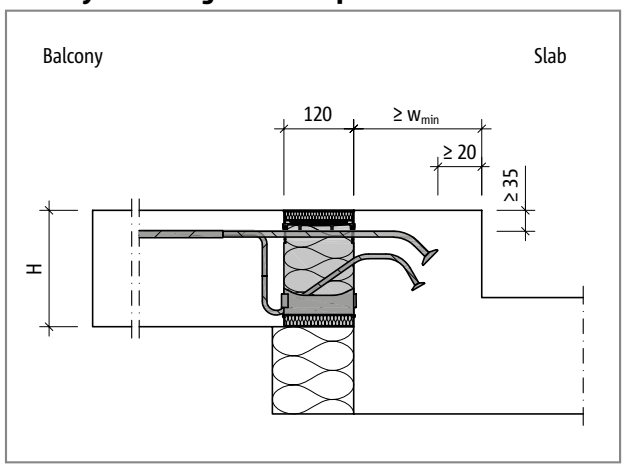


Fig. 89: Schöck Isokorb® XT type K-O: Balcony with height offset upwards and external insulation

Balcony with height offset downwards

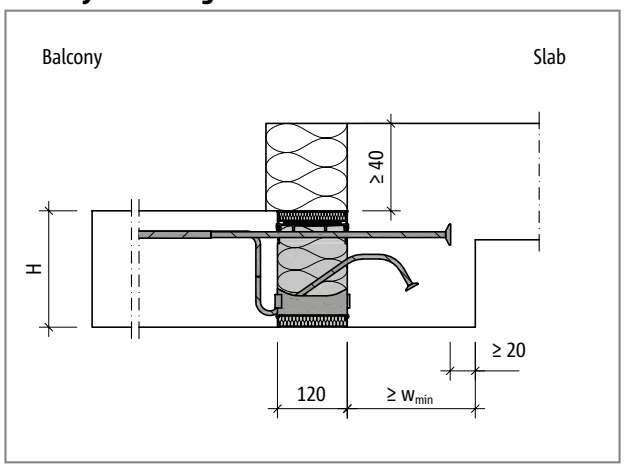


Fig. 90: Schöck Isokorb® XT type K-U: Balcony with height offset downwards and external insulation

Installation cross sections

Wall connection upwards

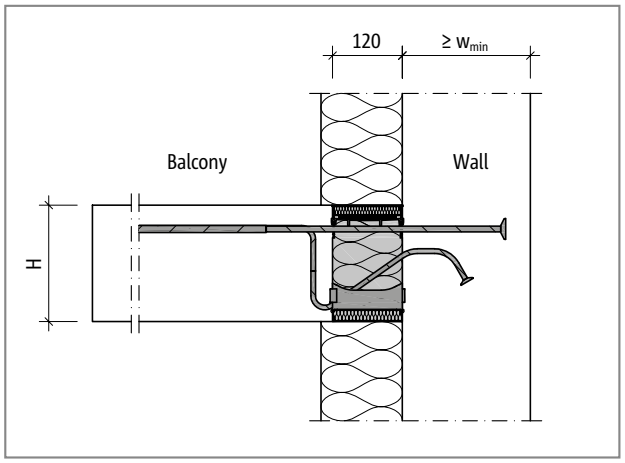


Fig. 91: Schöck Isokorb® XT type K-U: Wall connection upwards with external insulation

Wall connection downwards

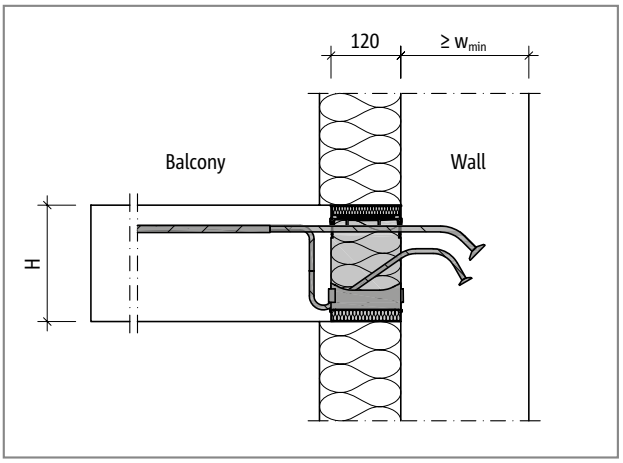


Fig. 92: Schöck Isokorb® XT type K-O: Wall connection downwards with external insulation

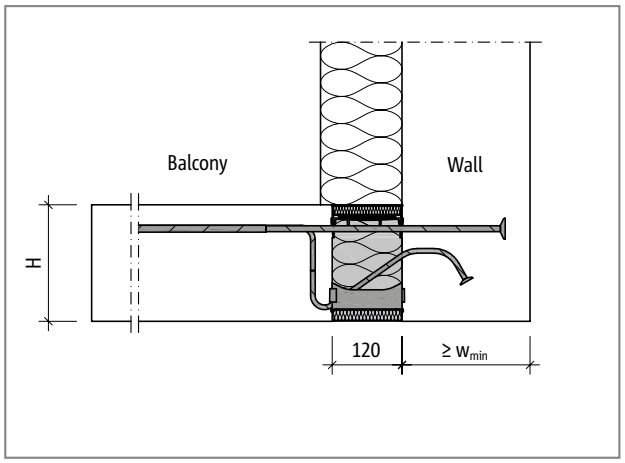


Fig. 93: Schöck Isokorb® XT type K-U: Wall connection upwards with external insulation

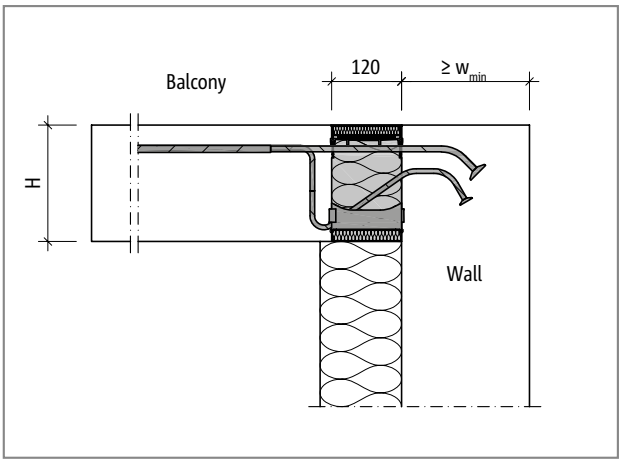


Fig. 94: Schöck Isokorb® XT type K-O: Wall connection downwards with external insulation

Geometry

- Use of the Schöck Isokorb® XT types K-U and K-O requires a minimum wall thickness and a minimum downstand beam width of 175 mm.
- Depending on the selected Schöck Isokorb® type and on the selected Isokorb® height a minimum structural component size w_{min} is required (see page 69)
- A minimum concrete cover of 60 mm above the anchor head must be complied with.

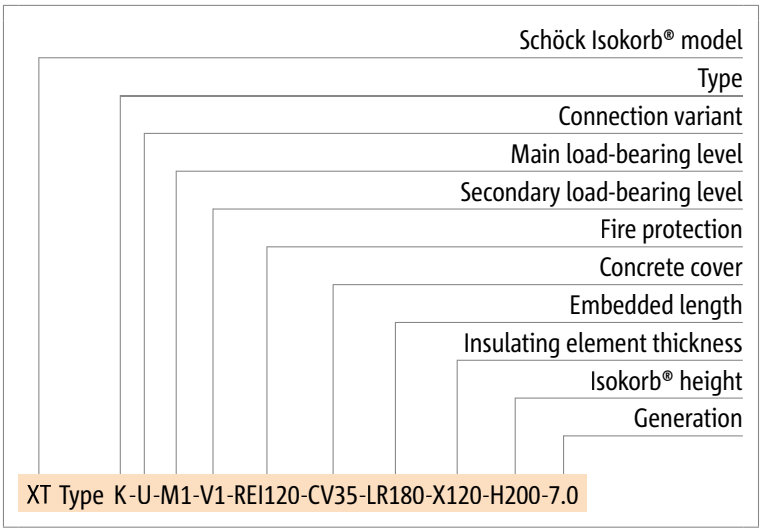
Product selection | Type designations | Special designs

Schöck Isokorb® XT type K-U variants

The configuration of the Schöck Isokorb® XT type K-U can vary as follows:

- Main load-nearing level: M1 to M4
- Secondary load-bearing level: V1
- Fire resistance class:
  REI120 (standard)
- Concrete cover of the tension bars: CV35 = 35 mm, CV50 = 50 mm
- Bond length: LR = 155 mm to 220 mm; depends on the Isokorb® height, see page 69.
- Insulating element thickness: X120 = 120 mm
- Isokorb® height: H = H_{min} to 250 mm
- Generation: 7.0

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).

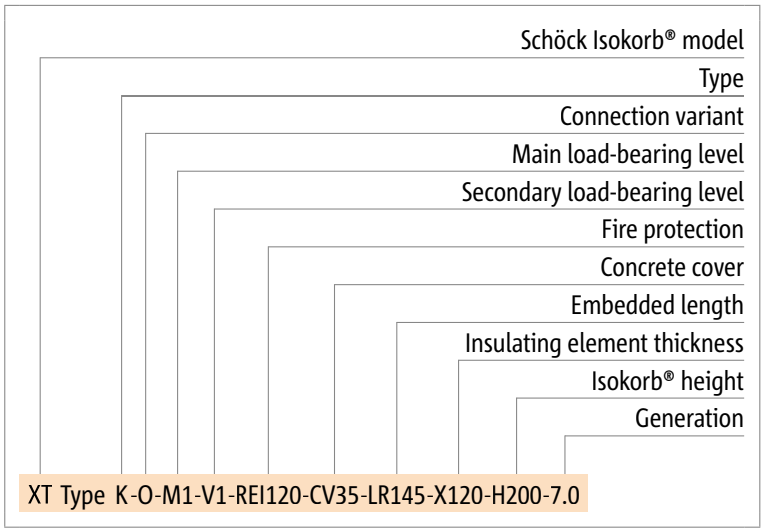
Product selection | Type designations | Special designs

Schöck Isokorb® XT type K-O Variants

The configuration of the Schöck Isokorb® XT type K-O can vary as follows:

- Main load-bearing level: M1 to M4
- Secondary load-bearing level: V1
- Fire resistance class:
  REI120 (standard)
- Concrete cover of the tension bars: CV35 = 35 mm, CV50 = 50 mm
- Bond length: LR = 145 mm to 190 mm; depends on the Isokorb® height, see page 69.
- Insulating element thickness: X120 = 120 mm
- Isokorb® height: H = H_{min} to 250 mm
- Generation: 7.0

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).

Minimum component dimensions

Schöck Isokorb® XT type K-U		M1 - M4			
minimum component dimension for		CV35		CV50	
		w_{min} [mm]	LR [mm]	w_{min} [mm]	LR [mm]
Isokorb® height H [mm]	160	175	155	-	-
	170	175	155	-	-
	180	175	155	175	155
	190	175	155	175	155
	200	200	180	175	155
	210	200	180	175	155
	220	220	200	200	180
	230	220	200	200	180
	240	240	220	220	200
	250	240	220	220	200

Schöck Isokorb® XT type K-O		M1 - M4			
minimum component dimension for		CV35		CV50	
		w_{min} [mm]	LR [mm]	w_{min} [mm]	LR [mm]
Isokorb® height H [mm]	160	175	145	-	-
	170	175	145	-	-
	180	175	145	175	145
	190	175	145	175	145
	200	175	145	175	145
	210	175	145	175	145
	220	190	170	175	145
	230	190	170	175	145
	240	210	190	190	170
	250	210	190	190	170

Design

Notes on design

- With CV50, H = 180 mm is the lowest Isokorb® height, this requires a minimum slab thickness of h = 180 mm.
- Use of the Schöck Isokorb® XT types K-U and K-O requires a minimum wall thickness and a minimum downstand beam width of 175 mm.
- The employment of Schöck Isokorb® XT type K-U and K-O is possible with other connection situations (175 mm ≤ w_{vorh} < w_{min}) taking into account reduced load-bearing capacity. For this please make contact with the Schöck Design Department (see page 3).
- Depending on the selected Schöck Isokorb® type and on the selected Isokorb® height a minimum structural component size w_{min} is required (see page 69)
- The design values for the Schöck Isokorb® XT type K-U depend on the available downstand beam width and wall thickness (w_{vorh}).
- A minimum concrete cover of 60 mm above the anchor head must be complied with.
- Direction of the load application in the neighbouring structural element determines the Isokorb® connection variant.

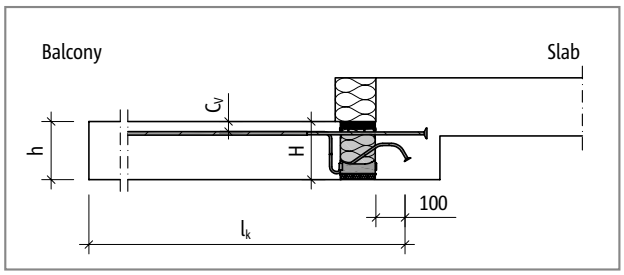


Fig. 95: Schöck Isokorb® XT type K-U: Static system

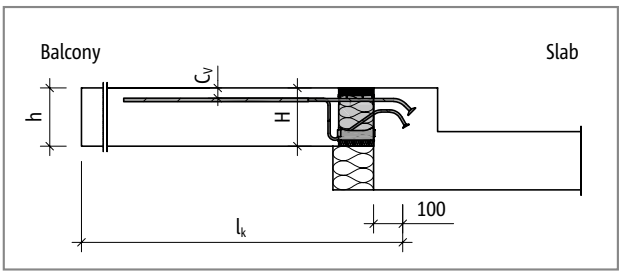


Fig. 96: Schöck Isokorb® XT type K-O: Static system

C25/30 design

Schöck Isokorb® XT type K-U			M1	M2	M3	M4
Design values with	Concrete cover CV [mm]		Concrete strength class ≥ C25/30			
			200 mm > downstand beam width ≥ 175 mm 200 mm >wall thickness ≥ 175 mm			
	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
Isokorb® height H [mm]	160		-11.5	-15.4	-19.2	-26.1
		180	-12.2	-16.3	-20.4	-27.7
	170		-12.9	-17.3	-21.6	-29.3
		190	-13.7	-18.2	-22.8	-30.9
	180		-14.4	-19.2	-23.9	-32.5
		200	-15.1	-20.1	-25.1	-34.1
	190		-15.8	-21.1	-26.3	-35.7
		210	-16.5	-22.0	-27.5	-37.4
Secondary load-bearing level			$v_{Rd,z}$ [kN/m]			
	V1		50.0	75.0	75.0	75.0

Schöck Isokorb® XT type K-U			M1	M2	M3	M4
Design values with	Concrete cover CV [mm]		Concrete strength class ≥ C25/30			
			220 mm > downstand beam width ≥ 200 mm 220 mm > wall thickness ≥ 200 mm			
	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
Isokorb® height H [mm]	160		-15.1	-20.1	-25.1	-34.1
		180	-16.0	-21.3	-26.6	-36.2
	170		-16.9	-22.5	-28.2	-38.3
		190	-17.8	-23.8	-29.7	-40.4
	180		-18.8	-25.0	-31.3	-42.5
		200	-19.7	-26.3	-32.8	-44.6
	190		-20.6	-27.5	-34.4	-46.7
		210	-21.6	-28.7	-35.9	-48.8
	200		-22.5	-30.0	-37.5	-50.9
		220	-23.4	-31.2	-39.0	-53.0
	210		-24.3	-32.5	-40.6	-55.1
		230	-25.3	-33.7	-42.1	-57.2
Secondary load-bearing level			$v_{Rd,z}$ [kN/m]			
	V1		50.0	75.0	75.0	75.0

Notes on design

Static system and information on the design see page 70.

C25/30 design

Schöck Isokorb® XT type K-U			M1	M2	M3	M4
Design values with	Concrete cover CV [mm]		Concrete strength class ≥ C25/30			
			Downstand beam width ≥ 220 mm wall thickness ≥ 220 mm			
	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
Isokorb® height H [mm]	160		-17.0	-24.3	-30.4	-41.1
		180	-18.2	-25.8	-32.2	-43.8
	170		-19.3	-27.3	-34.1	-46.3
		190	-20.5	-28.8	-36.0	-48.8
	180		-21.6	-30.3	-37.8	-51.4
		200	-22.9	-31.8	-39.7	-53.9
	190		-23.9	-33.3	-41.6	-56.5
		210	-25.2	-34.8	-43.5	-59.0
	200		-26.3	-36.3	-45.3	-61.6
		220	-27.6	-37.8	-47.2	-64.1
	210		-28.7	-39.3	-49.1	-66.7
		230	-30.1	-40.8	-51.0	-69.2
	220		-31.1	-42.3	-52.8	-71.7
		240	-32.5	-43.8	-54.7	-74.3
	230		-33.6	-45.3	-56.6	-76.8
		250	-35.0	-46.8	-58.4	-79.4
	Concrete cover CV [mm]		Downstand beam width ≥ 240 mm wall thickness ≥ 240 mm			
	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
	240		-36.1	-48.3	-60.3	-81.9
	250		-38.4	-51.3	-64.1	-87.0
Secondary load-bearing level			$v_{Rd,z}$ [kN/m]			
	V1		50.0	75.0	75.0	75.0

Schöck Isokorb® XT type K-U	M1	M2	M3	M4
Isokorb® length [mm]	1000	1000	1000	1000
Tension bars	4 ⌀ 12	6 ⌀ 12	8 ⌀ 12	10 ⌀ 12
Anchor bars	4 ⌀ 10	6 ⌀ 10	8 ⌀ 10	10 ⌀ 10
Shear force bars V1	4 ⌀ 8	6 ⌀ 8	6 ⌀ 8	6 ⌀ 8
Pressure bearing (piece)	6	8	10	16
Special stirrup (piece)	-	-	-	4

Notes on design

Static system and information on the design see page 70.

C25/30 design

Schöck Isokorb® XT type K-O			M1	M2	M3	M4
Design values with	Concrete cover CV [mm]		Concrete strength class ≥ C25/30			
			Downstand beam width ≥ 175 mm wall thickness ≥ 175 mm			
	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
Isokorb® height H [mm]	160		-17.0	-24.3	-30.4	-41.1
		180	-18.2	-25.8	-32.2	-43.8
	170		-19.3	-27.3	-34.1	-46.3
		190	-20.5	-28.8	-36.0	-48.8
	180		-21.6	-30.3	-37.8	-51.4
		200	-22.9	-31.8	-39.7	-53.9
	190		-23.9	-33.3	-41.6	-56.5
		210	-25.2	-34.8	-43.5	-59.0
	200		-26.3	-36.3	-45.3	-61.6
		220	-27.6	-37.8	-47.2	-64.1
	210		-28.7	-39.3	-49.1	-66.7
		230	-30.1	-40.8	-51.0	-69.2
	Concrete cover CV [mm]		Downstand beam width ≥ 190 mm wall thickness ≥ 190 mm			
	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
	220		-31.1	-42.3	-52.8	-71.7
		240	-32.5	-43.8	-54.7	-74.3
	230		-33.6	-45.3	-56.6	-76.8
		250	-35.0	-46.8	-58.4	-79.4
	Concrete cover CV [mm]		Downstand beam width ≥ 210 mm wall thickness ≥ 210 mm			
	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
	240		-36.1	-48.3	-60.3	-81.9
	250		-38.4	-51.3	-64.1	-87.0
Secondary load-bearing level			$v_{Rd,z}$ [kN/m]			
	V1		50.0	75.0	75.0	75.0

Schöck Isokorb® XT type K-O	M1	M2	M3	M4
Isokorb® length [mm]	1000	1000	1000	1000
Tension bars	4 ⌀ 12	6 ⌀ 12	8 ⌀ 12	10 ⌀ 12
Anchor bars	4 ⌀ 10	6 ⌀ 10	8 ⌀ 10	10 ⌀ 10
Shear force bars V1	4 ⌀ 8	6 ⌀ 8	6 ⌀ 8	6 ⌀ 8
Pressure bearing (piece)	6	8	10	16
Special stirrup (piece)	-	-	-	4

Notes on design

Static system and information on the design see page 70.

Deflection/Camber

Deflection

The deflection factors given in the table (tan α [%]) result alone from the deflection of the Schöck Isokorb® under 100% steel utilisation. They serve for the estimation of the required camber. The total arithmetic camber of the balcony slab formwork results from the calculation according to BS EN 1992-1-1 (EC2) and BS EN 1992-1-1/NA plus the deflection from Schöck Isokorb®. The camber of the balcony slab formwork to be given by the structural engineer/designer in the implementation plans (Basis: Calculated total deflection from cantilever slab + floor rotation angle + Schöck Isokorb®) should be such that the scheduled drainage direction is met (round up: With drainage towards the building facade, round down: With drainage towards the cantilever slab end.

deflection (p) as a result of Schöck Isokorb®

$p = \tan\alpha \cdot l_k \cdot (m_{pd} / m_{Rd}) \cdot 10$ [mm]

Factors to be applied:

$\tan\alpha$ = apply table value

l_k = cantilever length [m]

m_{pd} = relevant bending moment [kNm/m] in the ultimate limit state for the determination of the deflection p [mm] from Schöck Isokorb®.
The load combination to be applied for the deformation is laid down by the structural engineer.
(Recommendation: Determine load combination for the determination of the camber $w_ü$: g+q/2, $m_{üd}$ in the ultimate limit state)

m_{Rd} = Maximum design moment [kNm/m] of the Schöck Isokorb®

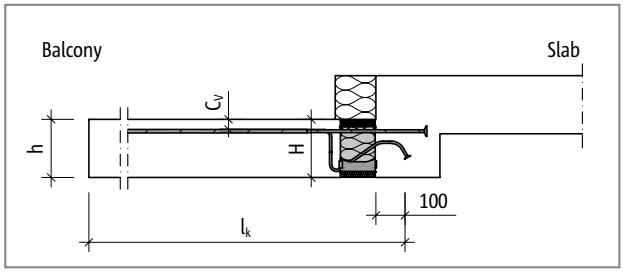


Fig. 97: Schöck Isokorb® XT type K-U: Static system

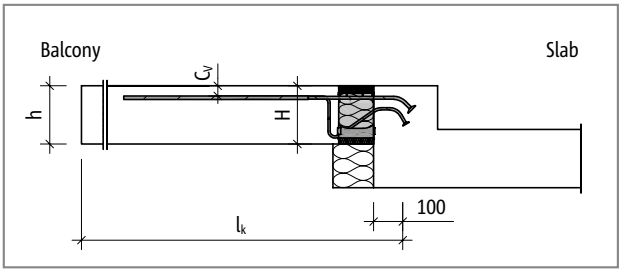


Fig. 98: Schöck Isokorb® XT type K-O: Static system

Deflection/Camber

Schöck Isokorb® XT type		K-U	
Deflection factors when		tan α [%]	
		200 mm > w_{exist} ≥ 175 mm	
		CV35	CV50
Isokorb® height H [mm]	160	1.0	-
	170	0.8	-
	180	0.8	0.9
	190	0.7	0.8
	200	-	0.7
	210	-	0.7

Schöck Isokorb® XT type		K-U	
Deflection factors when		tan α [%]	
		220 mm > w_{exist} ≥ 200 mm	
		CV35	CV50
Isokorb® height H [mm]	160	1.1	-
	170	1.0	-
	180	0.9	1.1
	190	0.8	1.0
	200	0.8	0.9
	210	0.7	0.8
	220	-	0.7
	230	-	0.7

Schöck Isokorb® XT type		K-U	
Deflection factors when		tan α [%]	
		w_{exist} ≥ 220 mm	
		CV35	CV50
Isokorb® height H [mm]	160	1.3	-
	170	1.1	-
	180	1.0	1.2
	190	0.9	1.1
	200	0.8	1.0
	210	0.8	0.9
	220	0.7	0.8
	230	0.7	0.7
	240	0.6	0.7
	250	0.6	0.7

Notes on deformation

- The deflection values for Schöck Isokorb® XT type K-U depend upon the available downstand beam width and wall thickness (w_{vorh}).
- The minimum structural element dimension wmin = 240 mm for CV 35 is to be observed for H ≥ 240 mm.

Deflection/Camber | Slenderness

Deflection factors XT type K-O

Schöck Isokorb® XT type		K-O	
Deflection factors when		tan α [%]	
		w_{exist} ≥ 175 mm	
		CV35	CV50
Isokorb® height H [mm]	160	1.3	-
	170	1.1	-
	180	1.0	1.2
	190	0.9	1.1
	200	0.8	1.0
	210	0.8	0.9
	220	0.7	0.8
	230	0.7	0.7
	240	0.6	0.7
	250	0.6	0.7

Slenderness

In order to safeguard the serviceability limit state we recommend the limitation of the slenderness to the following maximum cantilever lengths max l_k [m]:

Schöck Isokorb® XT type		K-U K-O	
maximum cantilever length with		$l_{k,max}$ [m]	
		CV35	CV50
Isokorb® height H [mm]	160	1.65	-
	170	1.78	-
	180	1.90	1.70
	190	2.03	1.80
	200	2.15	1.90
	210	2.28	2.00
	220	2.40	2.10
	230	2.53	2.20
	240	2.65	2.30
	250	2.78	2.40

Maximum cantilever length

The tabular values are based on the following assumptions:

- Accessible balcony
- Specific weight of concrete γ=25 kN/m³
- Dead weight of the balcony surfacing $g_2 \leq 1.2$ kN/m²
- Balcony rail $g_R \leq 0.75$ kN/m
- Service load q = 4.0 kN/m² with the coefficient $\psi_{2,i} = 0.3$ for the quasi-permanent combination

Maximum cantilever length

- The maximum cantilever length for ensuring the serviceability limit state is a benchmark. It can be limited with the employment of the Schöck Isokorb® XT type K through the load-bearing capacity.

Expansion joint spacing

Maximum expansion joint spacing

If the length of the structural component length exceeds the maximum expansion joint spacing e, then the expansion joints must be integrated into the external concrete components at right angles to the insulating layer in order to limit the effect as a result of temperature changes. With fixed points such as, for example, balcony corners or with the employment of the Schöck Isokorb® XT types H, half the maximum expansion joint spacing e/2 applies.
The shear force transmission in the expansion joint can be ensured using a longitudinally displaceable shear force dowel, e.g. Schöck Dorn.

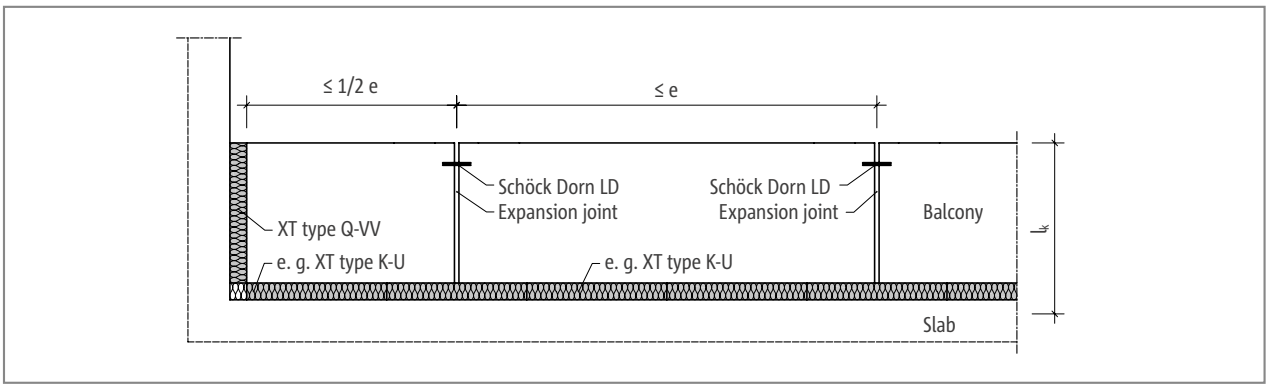


Fig. 99: Schöck Isokorb® XT type K-U: Expansion joint configuration

Schöck Isokorb® XT type		K-U K-O
Maximum expansion joint spacing e		e [m]
Insulating element thickness [mm]	120	21.7

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 tension bars from the free edge or from the expansion joint: $e_R \geq 50$ mm and $e_R \leq 150$ mm applies.
- 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

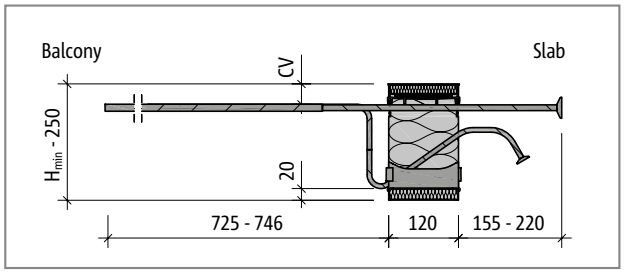


Fig. 100: Schöck Isokorb® XT type K-U-M2: Product section

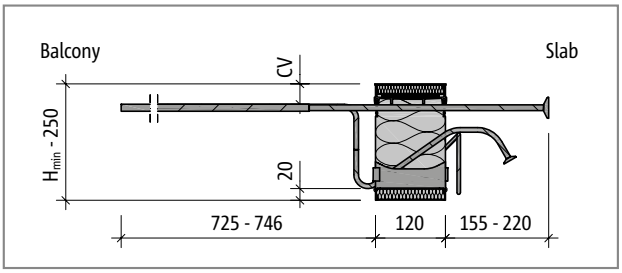


Fig. 101: Schöck Isokorb® XT type K-U-M4: Product section

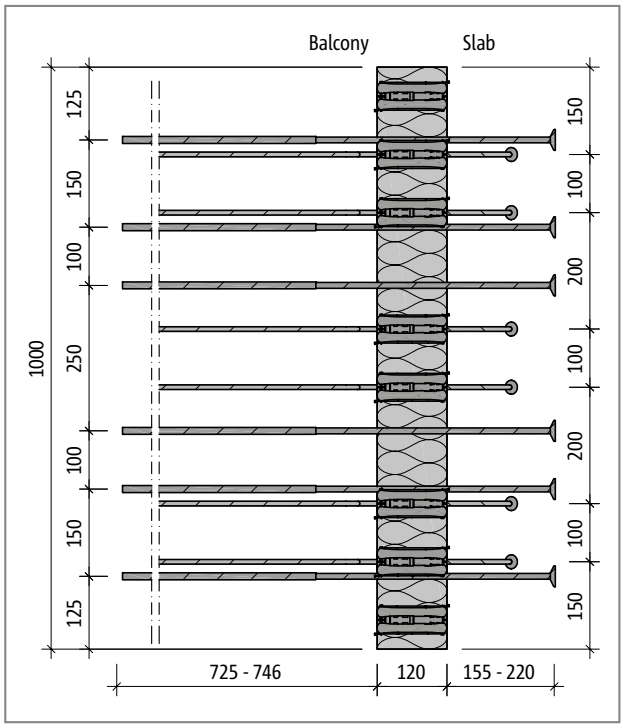


Fig. 102: Schöck Isokorb® XT type K-U-M2: Product plan view

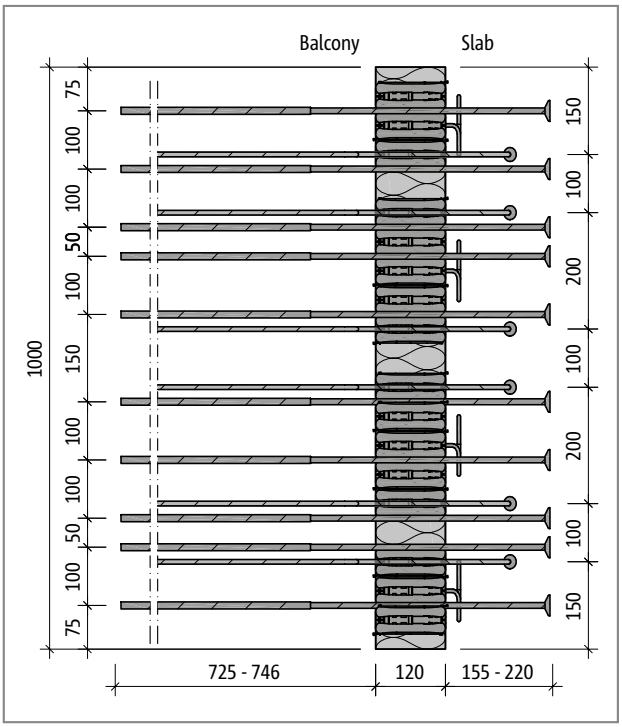


Fig. 103: Schöck Isokorb® XT type K-U-M4: Product plan view

Product information

- Download further product plan views and cross-sections at www.schoeck.co.uk/download
- Minimum height Schöck Isokorb® XT type K-U: H_{min} = 160 mm
- On-site spacing of the Schöck Isokorb® XT type K-U to the unreinforced points possible; take into account the reduced load-bearing force due to spacing; take into account required edge separations
- Concrete cover of the tension bars: CV35 = 35 mm, CV50 = 50 mm

Product description

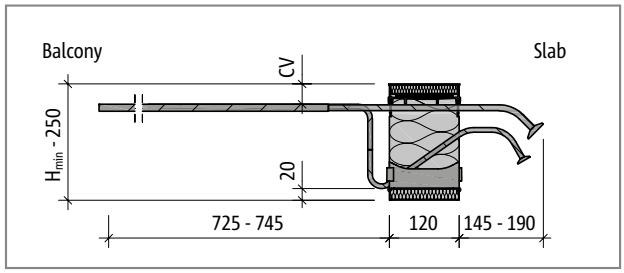


Fig. 104: Schöck Isokorb® XT type K-O-M2: Product section

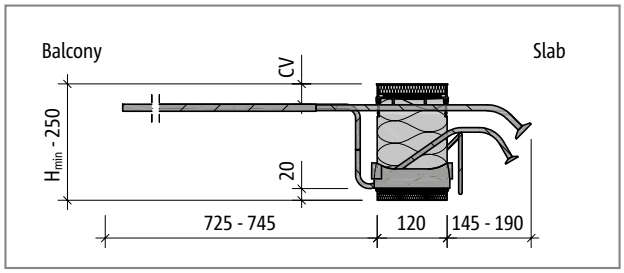


Fig. 105: Schöck Isokorb® XT type K-O-M4: Product section

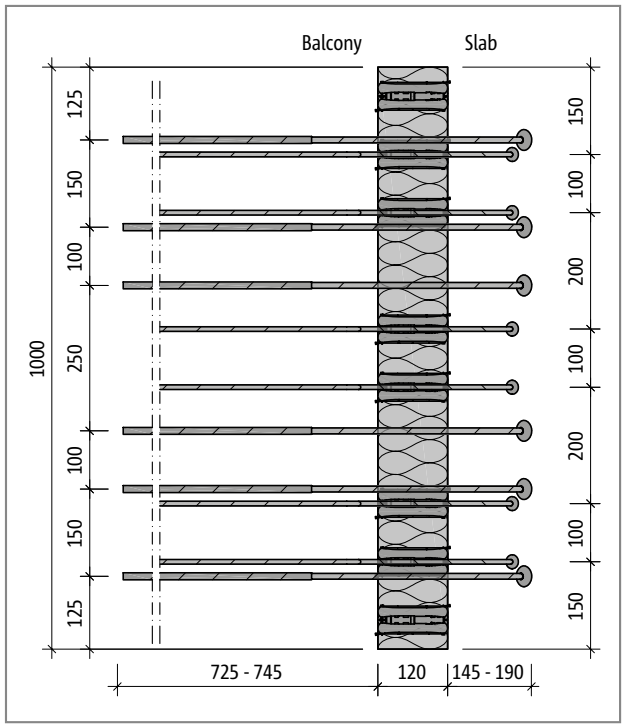


Fig. 106: Schöck Isokorb® XT type K-O-M2: Product plan view

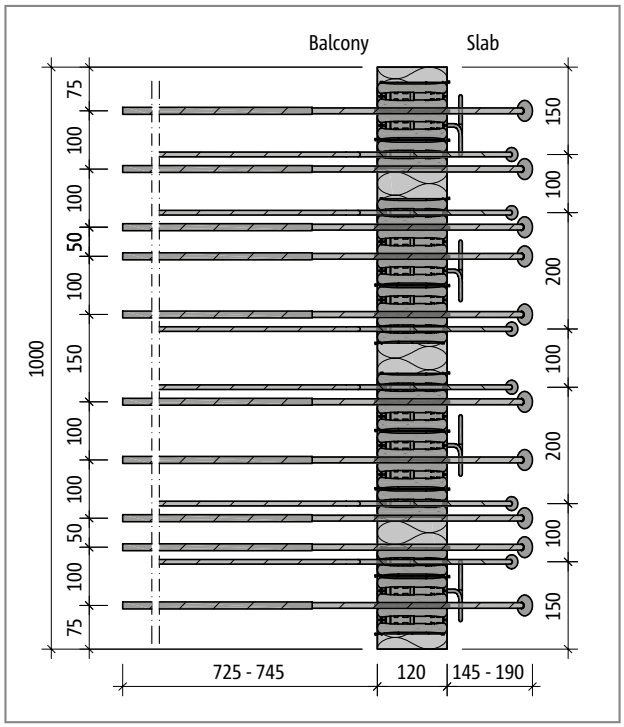


Fig. 107: Schöck Isokorb® XT type K-O-M4: Product plan view

Product information

- Download further product plan views and cross-sections at www.schoeck.co.uk/download
- Minimum height Schöck Isokorb® XT type K-O: H_{min} = 160 mm
- On-site spacingof the Schöck Isokorb® XT type K-O to the unreinforced points possible; take into account the reduced load-bearing force due to spacing; take into account required edge separations
- Concrete cover of the tension bars: CV35 = 35 mm, CV50 = 50 mm

On-site reinforcement - Schöck Isokorb® XT type K

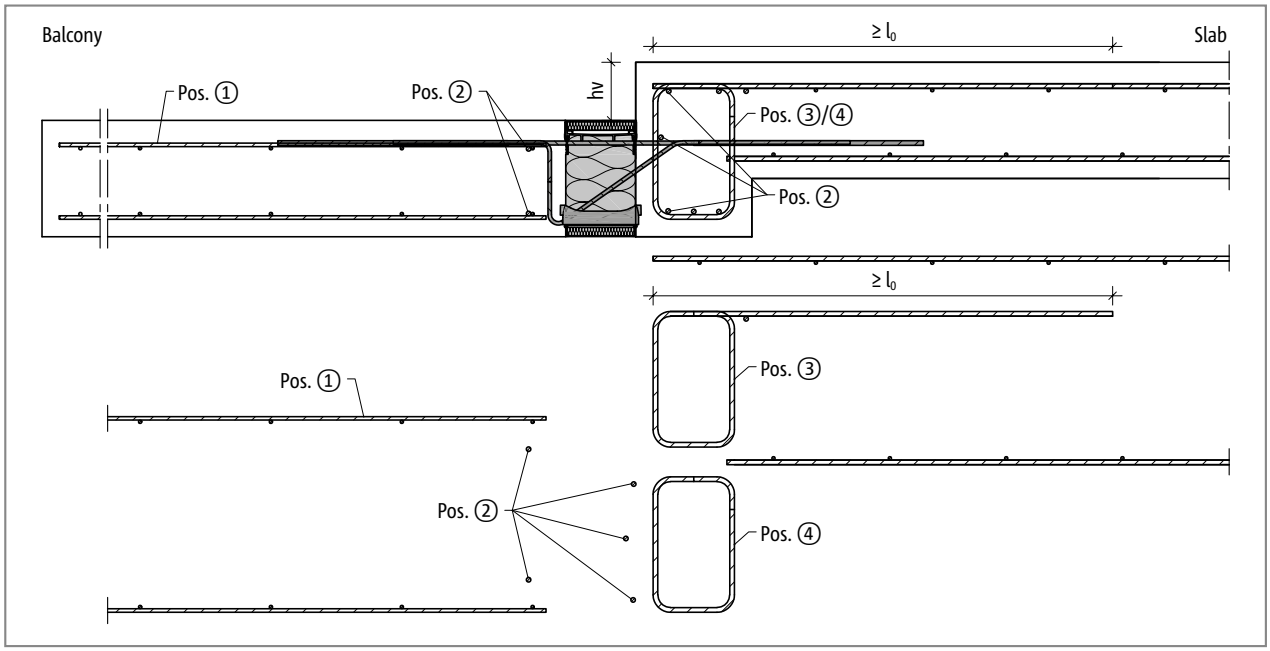


Fig. 108: Schöck Isokorb® XT type K: On-site reinforcement for small height offset

Information about on-site reinforcement

- Due to the reinforcement density in the downstand beam the use up to XT type K-M7 only is recommended.
- When reinforcing with different diameters the reinforcement specification for the largest diameter is relevant.
- The mixing of steel bar and wire mesh reinforcement is possible. The corresponding mesh reinforcement can be taken into account when determining the additional reinforcement.
- For the redirection of the tension force on the floor-side, a stirrup reinforcement Pos. 3 is required in the floor edge beam (upper side length $l_{0,bü}$). This stirrup reinforcement Pos.3 safeguards the load transmission from the Schöck Isokorb®.
- The shear force reinforcement Pos. 4 conforms to the loading of balcony, floor and the supporting width of the downstand/upstand beam. Therefore the shear force reinforcement in individual cases is to be verified by the structural engineer.
- The required lateral reinforcement in the overlap area is to be verified according to BS EN 1992-1-1 (EC2), 8.7 to 8.8 and BS EN 1992-1-1/NA, NDPs nd NCIs to 8.7 and 8.8.
- The Schöck Isokorb® XT type K is if necessary to be laid before the installation of the downstand or upstand beam reinforcement.
- Pos. 3: Value for Isokorb® heights between 160 mm and 250 mm may be interpolated.
- Pos. 3: For larger downstand beam widths a reduction of the required reinforcement acc. to the structural engineer's details is possible.

On-site reinforcement - Schöck Isokorb® XT type K

Recommendation for on-site connection reinforcement

Details of the lapping reinforcement for Schöck Isokorb® with a loading of 100 % of the maximum design moment with C25/30; variants adapted to load-bearing level. The required reinforcement cross-section depends on the bar diameter of the steel bar or wire mesh reinforcement.

Schöck Isokorb® XT type K			M1		M2		M3			M4		
On-site reinforcement	Secondary load-bearing level		V1	V2	V1	V2	V1	V2	VV1	V1	V2	VV1
	Location	Height [mm]	Floor (XC1) concrete strength class ≥ C25/30 Balcony (XC4) concrete strength class ≥ C25/30									
Pos. 1 overlap reinforcement depending on bar diameter												
Pos. 1 with ⌀8 [mm²/m]	Balcony side	160 - 250	289	258	457	426	575	544	603	661	622	689
Pos. 1 with ⌀10 [mm²/m]			352	317	553	518	695	662	722	798	755	825
Pos. 1 with ⌀12 [mm²/m]			422	381	664	622	834	794	866	958	906	990
Pos. 2 Steel bars along the insulation joint												
Pos. 2	Balcony side	160 - 250	2 • H8									
	Floor side	160 - 250	3 • H8									
Pos. 3 stirrup reinforcement for redirection of the tension force (single-shear chargeable)												
Pos. 3 [mm²/m]	Floor side	160	233	258	372	398	475	514	351	552	584	429
Pos. 3 [mm²/m]	Floor side	250	384	409	628	653	808	848	725	938	970	863
Pos. 4 Stirrup reinforcement acc. to shear force design												
Pos. 4	Floor side	160 - 250	Stirrup reinforcement according to BS EN 1992-1-1 (EC2), 6.2.3, 9.2.2									

Schöck Isokorb® XT type K			M5			M6			M7		
On-site reinforcement	Secondary load-bearing level		V1	V2	VV1	V1	V2	VV1	V1	V2	VV1
	Location	Height [mm]	Floor (XC1) concrete strength class ≥ C25/30 Balcony (XC4) concrete strength class ≥ C25/30								
Pos. 1 overlap reinforcement depending on bar diameter											
Pos. 1 with ⌀8 [mm²/m]	Balcony side	160 - 250	762	724	754	866	827	880	979	979	990
Pos. 1 with ⌀10 [mm²/m]			920	877	902	1044	1001	880	1040	1061	990
Pos. 1 with ⌀12 [mm²/m]			1104	1052	1082	1253	1201	880	1102	1143	990
Pos. 2 Steel bars along the insulation joint											
Pos. 2	Balcony side	160 - 250	2 • H8								
	Floor side	160 - 250	3 • H8								
Pos. 3 stirrup reinforcement for redirection of the tension force (single-shear chargeable)											
Pos. 3 [mm²/m]	Floor side	160	645	677	489	742	774	609	936	965	746
Pos. 3 [mm²/m]	Floor side	250	1104	1135	970	1278	1310	1185	1592	1621	1412
Pos. 4 Stirrup reinforcement acc. to shear force design											
Pos. 4	Floor side	160 - 250	Stirrup reinforcement according to BS EN 1992-1-1 (EC2), 6.2.3, 9.2.2								

On-site reinforcement - Schöck Isokorb® XT type K-U

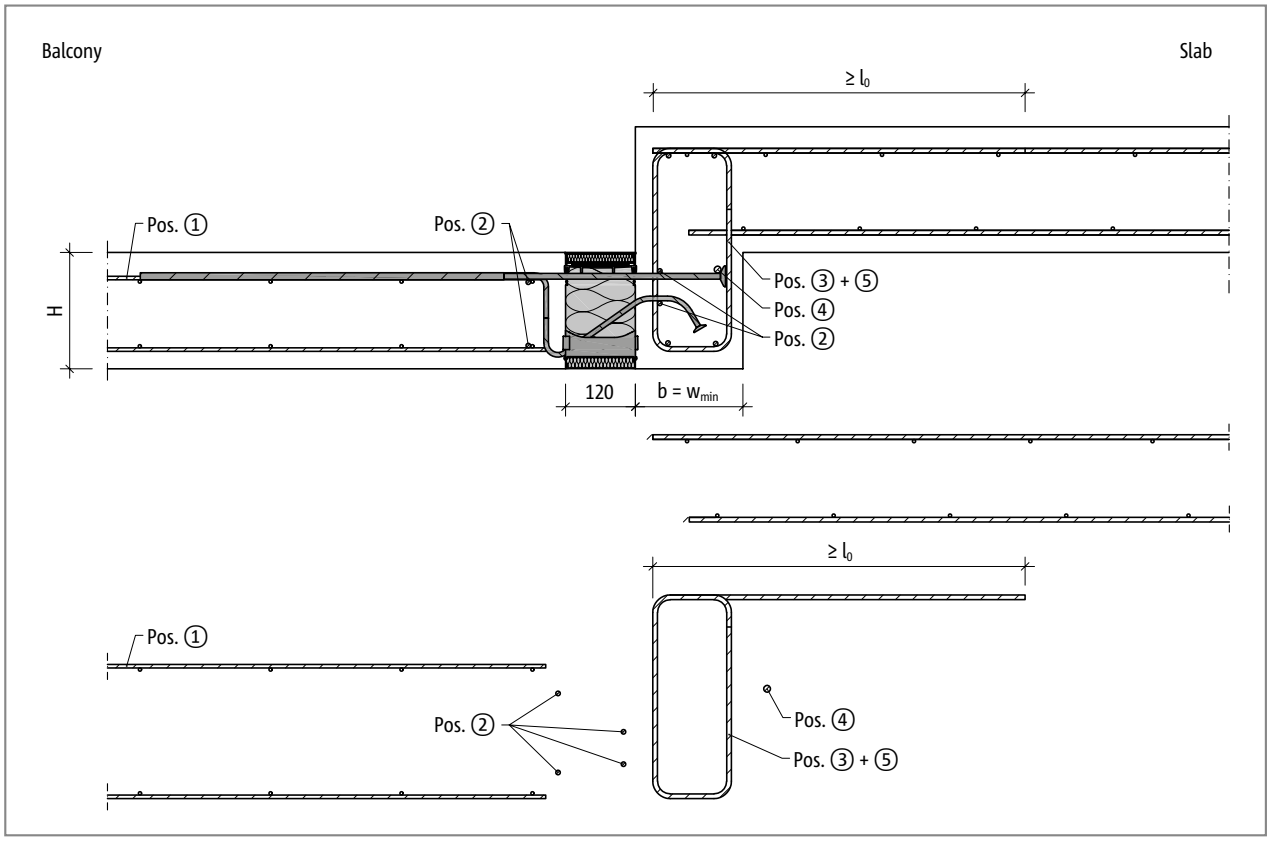


Fig. 109: Schöck Isokorb® XT type K-U: On-site reinforcement for balcony with height offset downwards with minimum structural element dimension (w_{vorh} = w_{min})

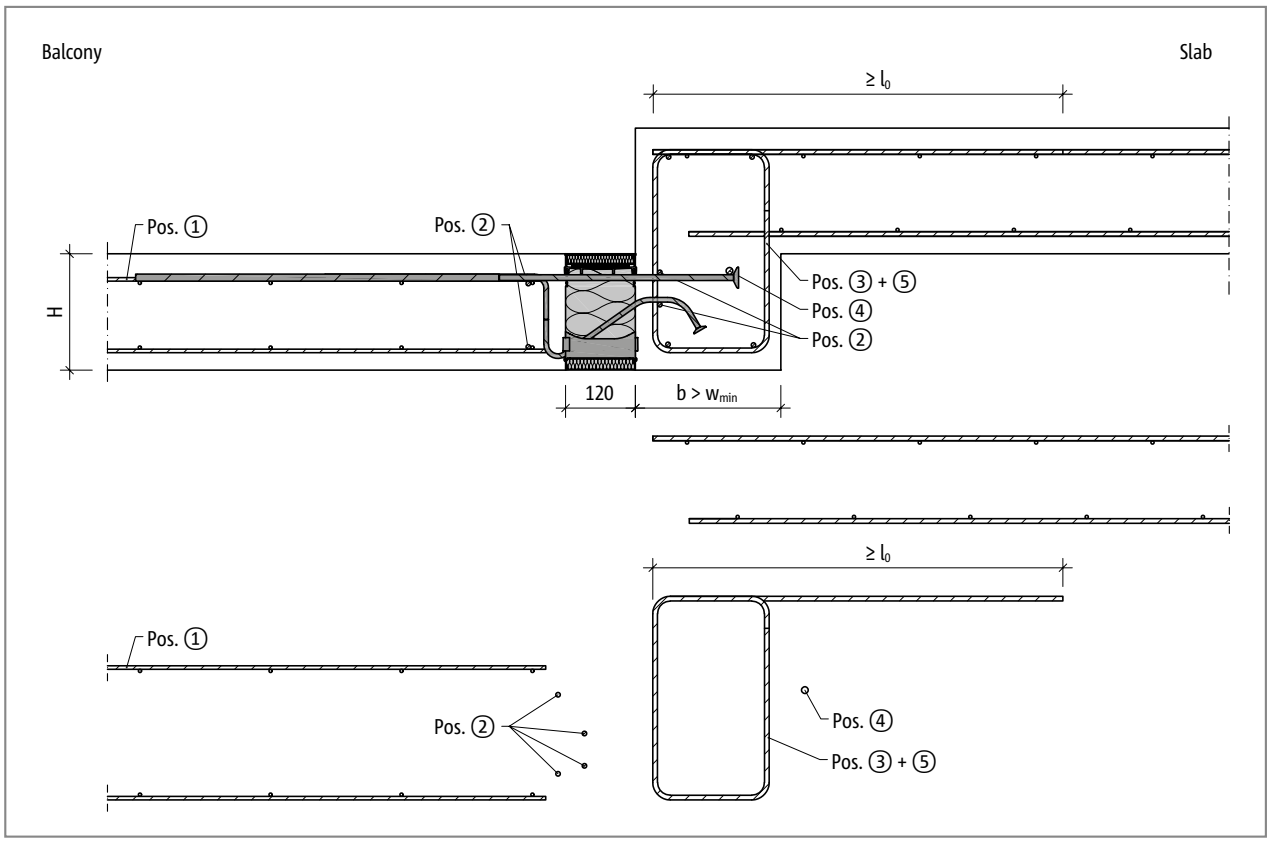


Fig. 110: Schöck Isokorb® XT type K-U: On-site reinforcement for balcony with height offset downwards with larger structural element dimension (w_{vorh} > w_{min})

On-site reinforcement - Schöck Isokorb® XT type K-U

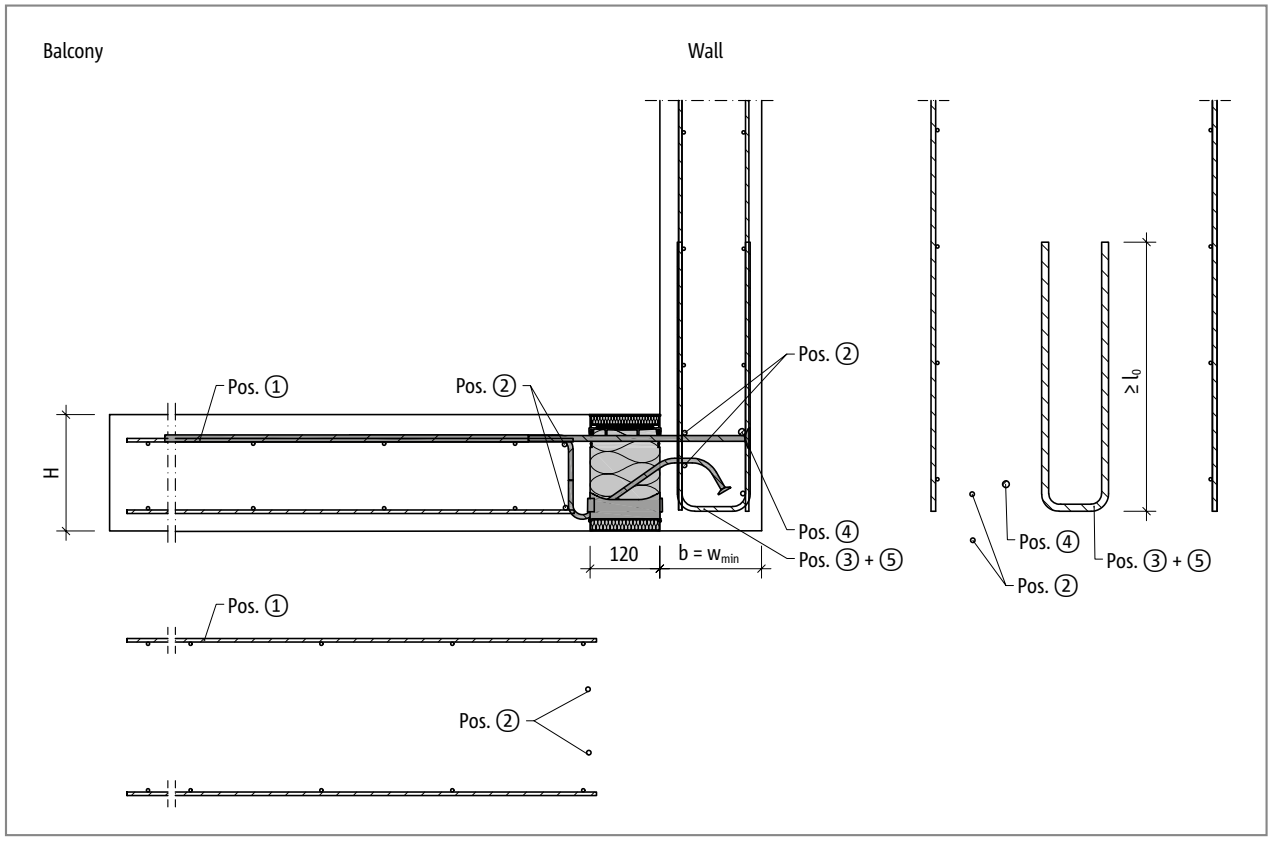


Fig. 111: Schöck Isokorb® XT type K-U: On-site reinforcement for wall connection upwards with minimum structural element dimension ($w_{vorh} = w_{min}$)

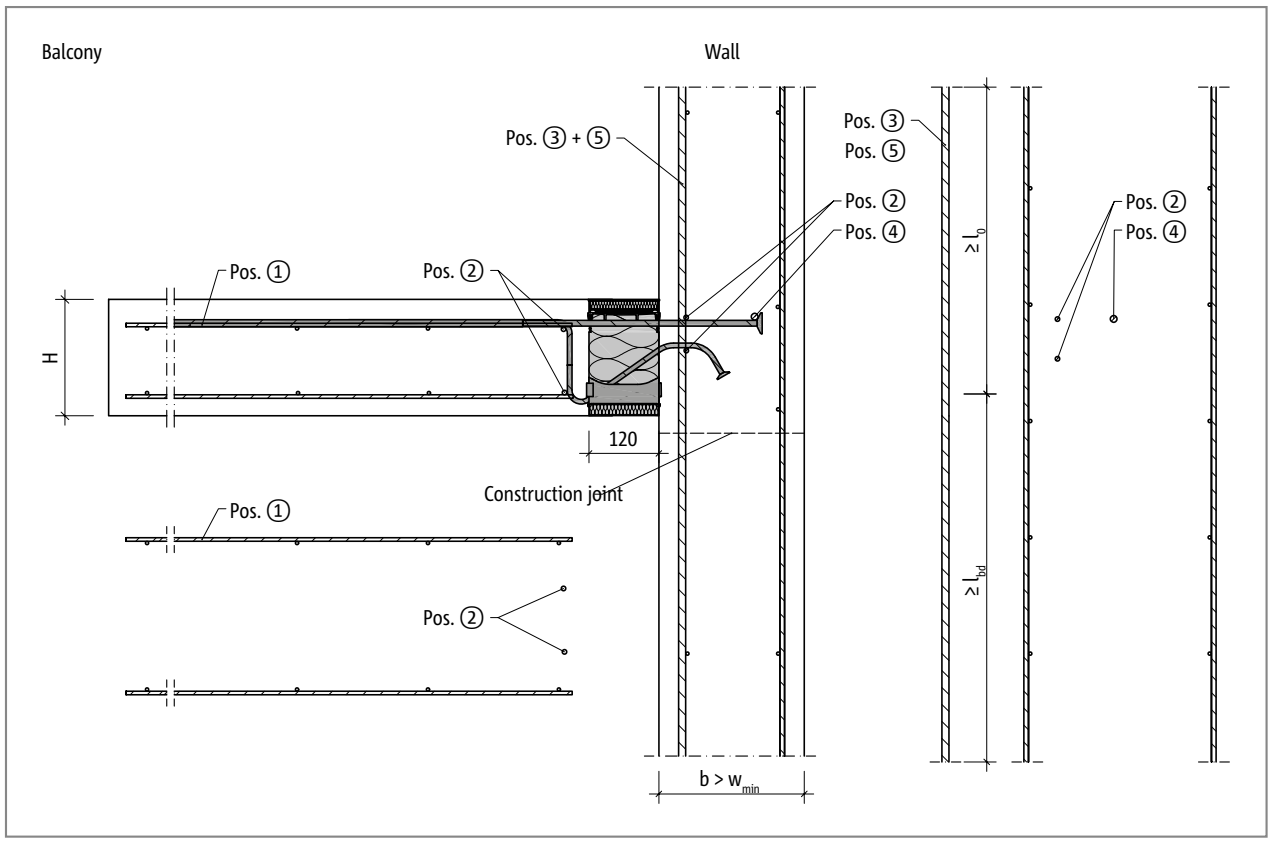


Fig. 112: Schöck Isokorb® XT type K-U: On-site reinforcement for wall connection upwards with larger structural element dimension ($w_{vorh} > w_{min}$)

On-site reinforcement - Schöck Isokorb® XT type K-U

Recommendation for on-site connection reinforcement

Details of the lapping reinforcement for Schöck Isokorb® with a loading of 100 % of the maximum design moment with C25/30; variants adapted to load-bearing level. The required reinforcement cross-section depends on the bar diameter of the steel bar or wire mesh reinforcement.

Schöck Isokorb® XT type K-U			M1	M2	M3	M4
On-site reinforcement	Location	Height [mm]	Concrete strength class ≥ C25/30 200 mm > downstand beam width ≥ 175 mm 200 mm >wall thickness ≥ 175 mm			
Pos. 1 overlap reinforcement depending on bar diameter						
Pos. 1 with ⌀8 [mm²/m]	Balcony side	160 - 210	327	436	545	740
Pos. 1 with ⌀10 [mm²/m]			368	498	607	802
Pos. 1 with ⌀12 [mm²/m]			409	559	668	864
Pos. 2 Steel bars along the insulation joint						
Pos. 2	balcony side/ downstand beam, wall	160 - 210	2 • 2 • H8			
Pos. 3 Vertical reinforcement						
Pos. 3 [mm²/m] minimum reinforcement	downstand beam, wall	160 - 210	≥ 528	≥ 737	≥ 846	≥ 1041
Pos. 3 structural element design	downstand beam, wall	160 - 210	Taking into account the moments and shear forces provided by the structural engineer			
Pos. 4 Steel bars along the insulation joint						
Pos. 4	downstand beam, wall	160 - 210	≥ 1 ⌀ 12			
Pos. 5 splitting tension reinforcement						
Pos. 5 [mm²/m]	downstand beam, wall	160 - 210	130			

Schöck Isokorb® XT type K-U			M1	M2	M3	M4
On-site reinforcement	Location	Height [mm]	Concrete strength class ≥ C25/30 220 mm > downstand beam width ≥ 200 mm 220 mm >wall thickness ≥ 200 mm			
Pos. 1 overlap reinforcement depending on bar diameter						
Pos. 1 with ⌀8 [mm²/m]	Balcony side	160 - 230	427	570	712	967
Pos. 1 with ⌀10 [mm²/m]			468	631	774	1029
Pos. 1 with ⌀12 [mm²/m]			509	693	835	1090
Pos. 2 Steel bars along the insulation joint						
Pos. 2	balcony side/ downstand beam, wall	160 - 230	2 • 2 • H8			
Pos. 3 Vertical reinforcement						
Pos. 3 [mm²/m] minimum reinforcement	downstand beam, wall	160 - 230	≥ 628	≥ 871	≥ 1013	≥ 1268
Pos. 3 structural element design	downstand beam, wall	160 - 230	Taking into account the moments and shear forces provided by the structural engineer			
Pos. 4 Steel bars along the insulation joint						
Pos. 4	downstand beam, wall	160 - 230	≥ 1 ⌀ 12			
Pos. 5 splitting tension reinforcement						
Pos. 5 [mm²/m]	downstand beam, wall	160 - 230	130			

On-site reinforcement - Schöck Isokorb® XT type K-U

Schöck Isokorb® XT type K-U			M1	M2	M3	M4
On-site reinforcement	Location	Height [mm]	Concrete strength class ≥ C25/30 Downstand beam width ≥ 220 mm wall thickness ≥ 220 mm			
Pos. 1 overlap reinforcement depending on bar diameter						
Pos. 1 with ⌀8 [mm²/m]	Balcony side	160 - 250	517	689	862	1170
Pos. 1 with ⌀10 [mm²/m]			558	751	923	1232
Pos. 1 with ⌀12 [mm²/m]			599	813	985	1293
Pos. 2 Steel bars along the insulation joint						
Pos. 2	balcony side/ downstand beam, wall	160 - 250	2 • 2 • H8			
Pos. 3 Vertical reinforcement						
Pos. 3 [mm²/m] minimum reinforcement	downstand beam, wall	160 - 250	≥ 640	≥ 960	≥ 1163	≥ 1400
Pos. 3 structural element design	downstand beam, wall	160 - 250	Taking into account the moments and shear forces provided by the structural engineer			
Pos. 4 Steel bars along the insulation joint						
Pos. 4	downstand beam, wall	160 - 250	≥ 1 ⌀ 12			
Pos. 5 splitting tension reinforcement						
Pos. 5 [mm²/m]	downstand beam, wall	160 - 250	130			

Information about on-site reinforcement

- The mixing of steel bar and wire mesh reinforcement is possible. The corresponding mesh reinforcement can be taken into account when determining the additional reinforcement.
- When reinforcing with different diameters the reinforcement specification for the largest diameter is relevant.
- The minimum reinforcement of Pos. 3 serves for the transfer of the active bar axial forces from the Isokorb®. This minimum reinforcement must be complied with.
  The required reinforcement from the structural element design as a result of the loading of the balcony, floors, walls and the supporting width of the downstand/upstand beam is to be verified by the structural engineer. The reinforcement determined from this must be compared with the minimum reinforcement of Pos, 3.
  The greater of the two values is relevant.
- Isokorb® height for CV35: H = 160 - 190 mm for downstand beam width w_{min} < 200 mm
  H = 160 - 210 mm for downstand beam width w_{min} < 220 mm
  H = 160 - 230 mm for downstand beam width w_{min} < 240 mm
- The required lateral reinforcement in the overlap area is to be verified according to BS EN 1992-1-1 (EC2), 8.7 to 8.8 and BS EN 1992-1-1/NA, NDPs nd NCIs to 8.7 and 8.8.
- l_0 for l_0 (⌀10) ≥ 570 mm, l_0 for l_0 (⌀12) ≥ 680 mm, l_0 (⌀14) ≥ 790 mm nd l_0 (⌀16) ≥ 910 mm.
- With the selection of the Isokorb® type channels and inclinations must be taken into account, in order to maintain the required concrete cover.
- For safe application of force the information with regard to the lift joint is to be complied with, see page 91.

Hazard warning - missing connection bar

- For the given load-bearing capacity, the transverse reinforcement bar is absolutely necessary. This transverse reinforcement bar must be fitted directly to the anchor head.

On-site reinforcement - Schöck Isokorb® XT type K-U

Design example

Numerical example for stirrup design (Pos. 3 + 5):

Geometry: Isokorb® height H = 200 mm
downstand beam width w_{vorh} = 220 mm
concrete cover CV30

Concrete strength: C25/30

Internal forces from balcony: m_{Ed} = -45.3 kNm/m
v_{Ed} = 35.0 kN/m

Selected: XT type K-U-M3-V1-REI120-CV35-LR180-X120-H200-7.0

Minimum reinforcement for Pos. 3: $a_{s,min}$ = 11.63 cm²/m
Required reinforcement from structural element design: $a_{s,req}$ = 5.67 cm²/m < 11.63 cm²/m = $a_{s,min}$

⇒ The minimum reinforcement $a_{s,min}$ = 11.63 cm²/m is decisive!

Required splitting tensile reinforcement Pos. 5: $a_{s,req}$ = 1.30 cm²/m

⇒ Required stirrup cross-section: $a_{s,req}$ = 11.63 cm²/m + 1.30 cm²/m = 12.93 cm²/m

On-site reinforcement - Schöck Isokorb® XT type K-O

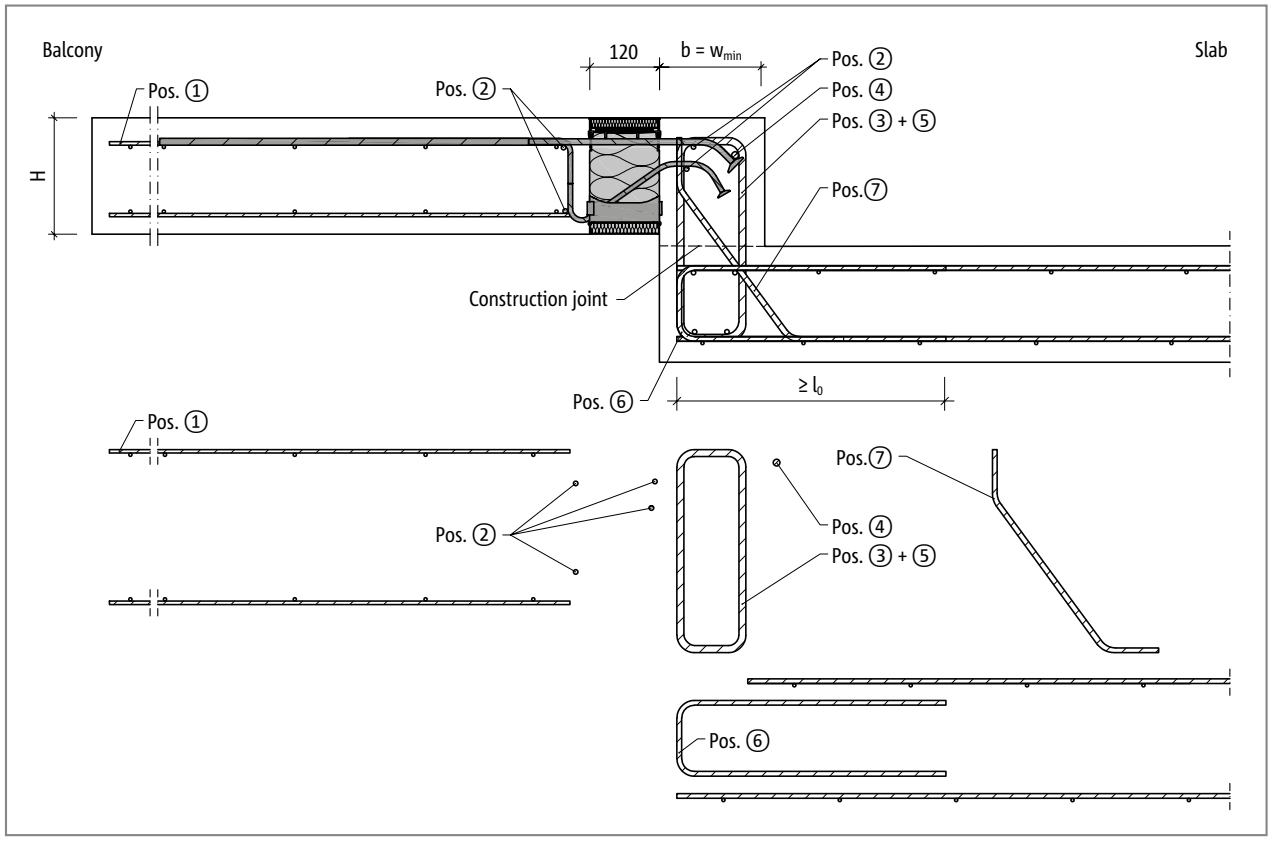


Fig. 113: Schöck Isokorb® XT type K-O: On-site reinforcement for balcony with height offset upwards with minimum structural element dimension (w_{vorh} = w_{min})

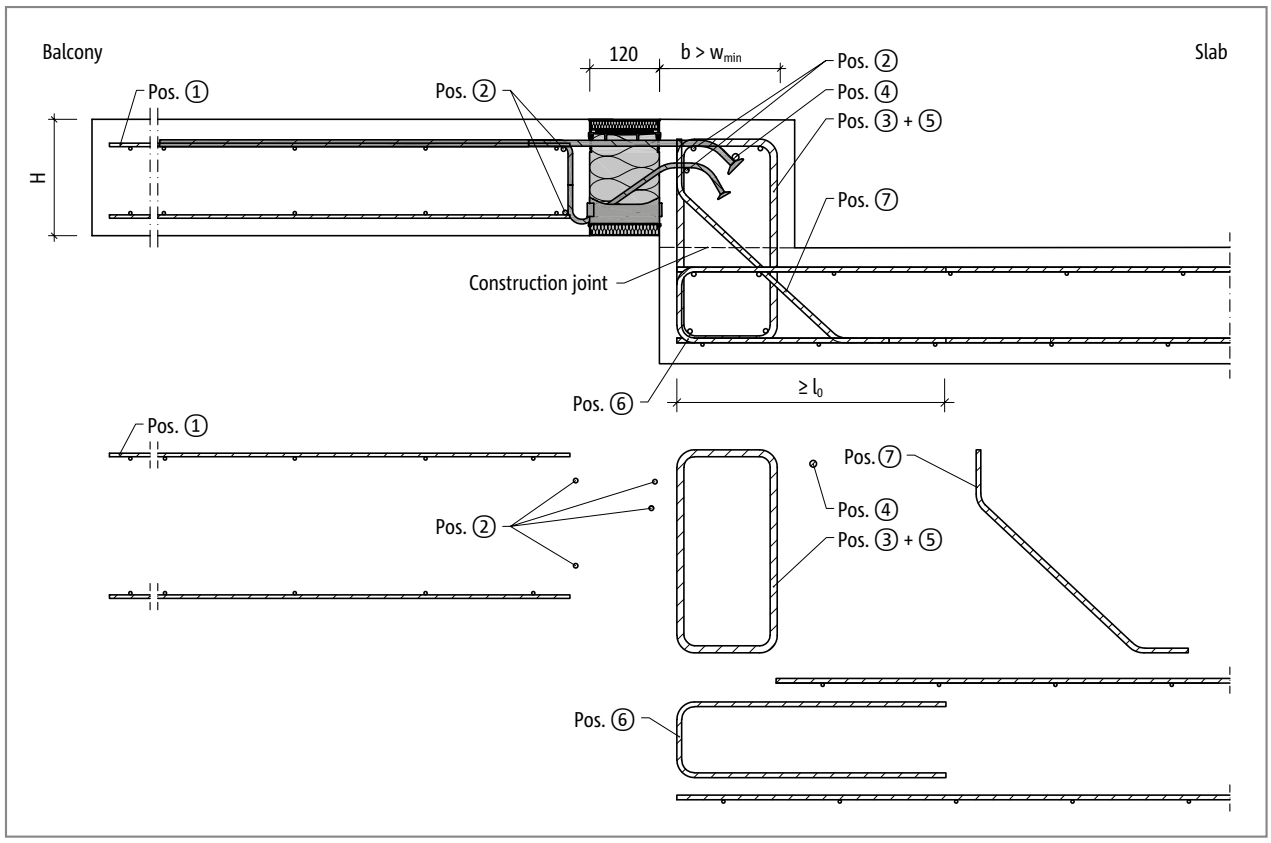


Fig. 114: Schöck Isokorb® XT type K-O: On-site reinforcement for balcony with height offset upwards with larger structural element dimension (w_{vorh} > w_{min})

On-site reinforcement - Schöck Isokorb® XT type K-O

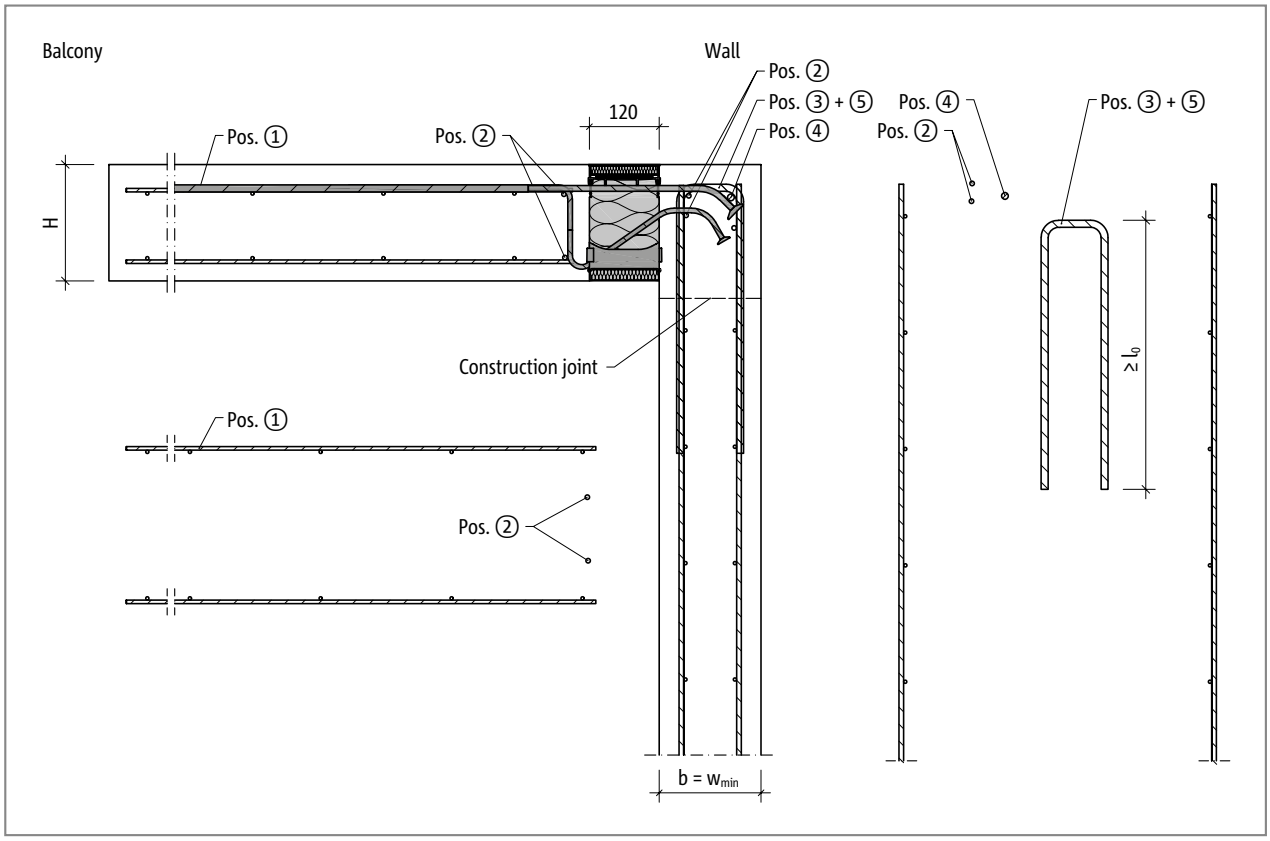


Fig. 115: Schöck Isokorb® XT type K-O: On-site reinforcement for wall connection upwards with minimum structural element dimension ($w_{vorh} = w_{min}$)

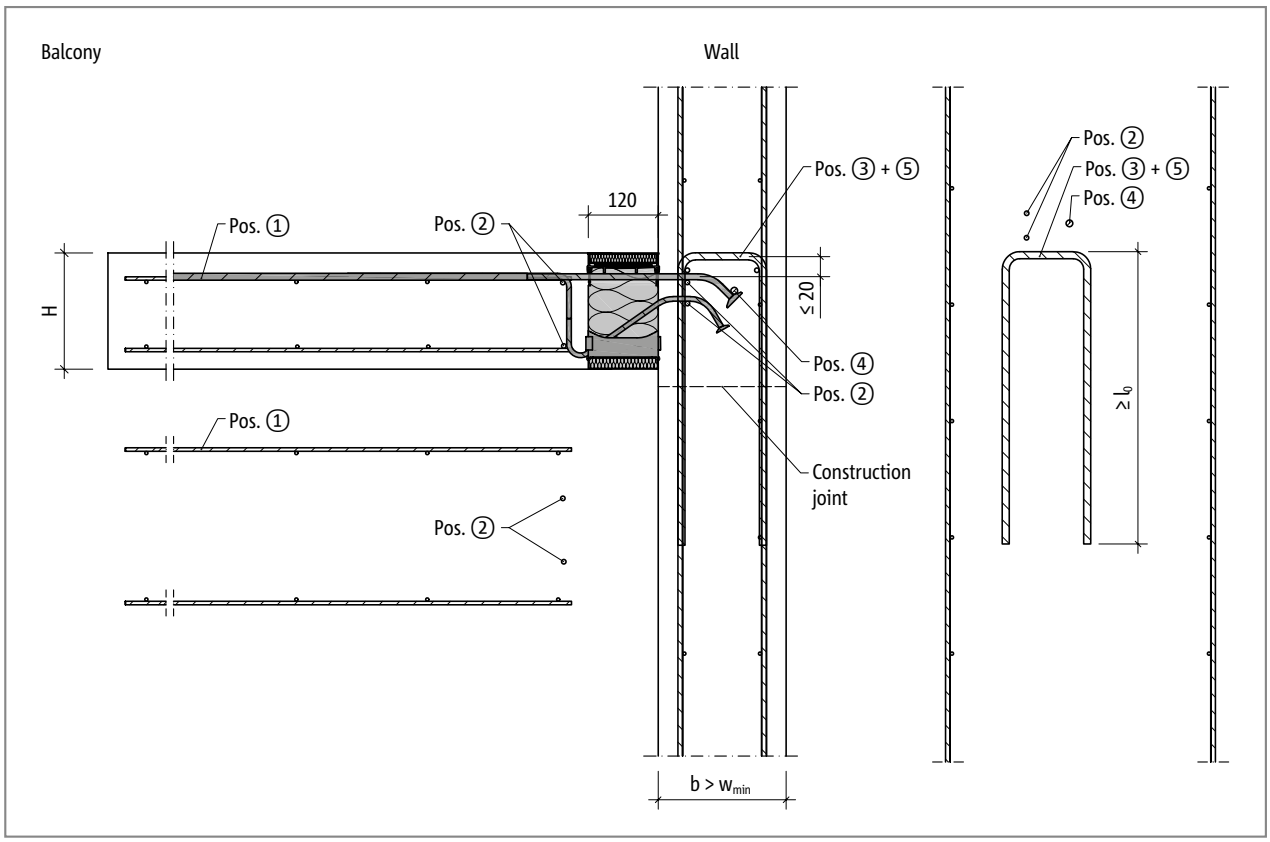


Fig. 116: Schöck Isokorb® XT type K-O: On-site reinforcement for wall connection with larger structural element dimension (($w_{vorh} > w_{min}$)

On-site reinforcement - Schöck Isokorb® XT type K-O

Recommendation for on-site connection reinforcement

Details of the lapping reinforcement for Schöck Isokorb® with a loading of 100 % of the maximum design moment with C25/30; variants adapted to load-bearing level. The required reinforcement cross-section depends on the bar diameter of the steel bar or wire mesh reinforcement.

Schöck Isokorb® XT type K-O			M1	M2	M3	M4
On-site reinforcement	Location	Height [mm]	Concrete strength class ≥ C25/30 Downstand beam width ≥ 175 mm wall thickness ≥ 175 mm			
Pos. 1 overlap reinforcement depending on bar diameter						
Pos. 1 with ⌀8 [mm²/m]	Balcony side	160 - 250	517	689	862	1170
Pos. 1 with ⌀10 [mm²/m]			558	751	923	1232
Pos. 1 with ⌀12 [mm²/m]			599	813	985	1293
Pos. 2 Steel bars along the insulation joint						
Pos. 2	balcony side/ downstand beam, wall	160 - 250	2 • 2 • H8			
Pos. 3 Vertical reinforcement						
Pos. 3 [mm²/m] minimum reinforcement	downstand beam, wall	160 - 250	≥ 640	≥ 960	≥ 1163	≥ 1400
Pos. 3 Structural component design	downstand beam, wall	160 - 250	Taking into account the moments and shear forces provided by the structural engineer			
Pos. 4 Steel bars along the insulation joint						
Pos. 4	downstand beam, wall	160 - 250	≥ 1 ⌀ 12			
Pos. 5 splitting tension reinforcement						
Pos. 5 [mm²/m]	downstand beam, wall	160 - 250	130			
Pos.6 Slip in bracket						
Pos. 6	Floor side	160 - 250	acc. to the specifications of the structural engineer			
Pos. 7 Slanting reinforcement						
Pos.7	Downstand beam	160 - 250	acc. to the specifications of the structural engineer			

Information about on-site reinforcement

Information about on-site reinforcement see page 90.

Hazard warning - missing connection bar

For the given load-bearing capacity, the transverse reinforcement bar is absolutely necessary. This transverse reinforcement bar must be fitted directly to the anchor head.

On-site reinforcement - Schöck Isokorb® XT type K-O

Information about on-site reinforcement

- The mixing of steel bar and wire mesh reinforcement is possible. The corresponding mesh reinforcement can be taken into account when determining the additional reinforcement.
- When reinforcing with different diameters the reinforcement specification for the largest diameter is relevant.
- The minimum reinforcement of Pos. 3 serves for the transfer of the active bar axial forces from the Isokorb®. This minimum reinforcement must be complied with.
  The required reinforcement from the structural element design as a result of the loading of the balcony, floors, walls and the supporting width of the downstand/upstand beam is to be verified by the structural engineer. The reinforcement determined from this must be compared with the minimum reinforcement of Pos, 3.
  The greater of the two values is relevant.
- Isokorb® height for CV35: H = 160 - 210 mm for downstand beam width w_{min} < 190 mm
  H = 160 - 230 mm for downstand beam width w_{min} < 210 mm
- Pos. 3 and Pos. 5 are to be brought as close as possible over the tension bar of the Schöck Isokorb®. The distance between the on-site stirrup reinforcement and the upper edge of the tension bar is smaller than 2 cm.
- The required lateral reinforcement in the overlap area is to be verified according to BS EN 1992-1-1 (EC2), 8.7 to 8.8 and BS EN 1992-1-1/NA, NDPs nd NCIs to 8.7 and 8.8.
- l_0 for l_0 (⌀10) ≥ 570 mm, l_0 for l_0 (⌀12) ≥ 680 mm, l_0 (⌀14) ≥ 790 mm nd l_0 (⌀16) ≥ 910 mm.
- With the selection of the Isokorb® type channels and inclinations must be taken into account, in order to maintain the required concrete cover.
- For safe application of force the information with regard to the lift joint is to be complied with, see page 91.

Hazard warning - missing connection bar

- For the given load-bearing capacity, the transverse reinforcement bar is absolutely necessary. This transverse reinforcement bar must be fitted directly to the anchor head.

Design example

- Numerical example for stirrup design (Pos. 3 + 5):

Geometry: Isokorb® height H = 230 mm
downstand beam width w_{vorh} = 175 mm
concrete cover CV30

Concrete strength: C25/30

Internal forces from balcony: m_{Ed} = -69.2 kNm/m
v_{Ed} = 21.6 kN/m

Selected: XT type K-O-M4-V1-REI120-CV50-LR145-X120-H230-7.0

Minimum reinforcement for Pos. 3: $a_{s,min}$ = 14.00 cm²/m
Required reinforcement from structural element design: $a_{s,req}$ = 14.46 cm²/m > 14.00 cm²/m = $a_{s,min}$

⇒ The required reinforcement from bending design $a_{s,req}$ = 14.46 cm²/m is relevant!

Required splitting tensile reinforcement Pos. 5: $a_{s,req}$ = 1.30 cm²/m

⇒ Required stirrup cross-section: $a_{s,req}$ = 14.46 cm²/m + 1.30 cm²/m = 15.76 cm²/m

Tight fit/Concreting section | Installation instructions

Tight fit/Concreting section

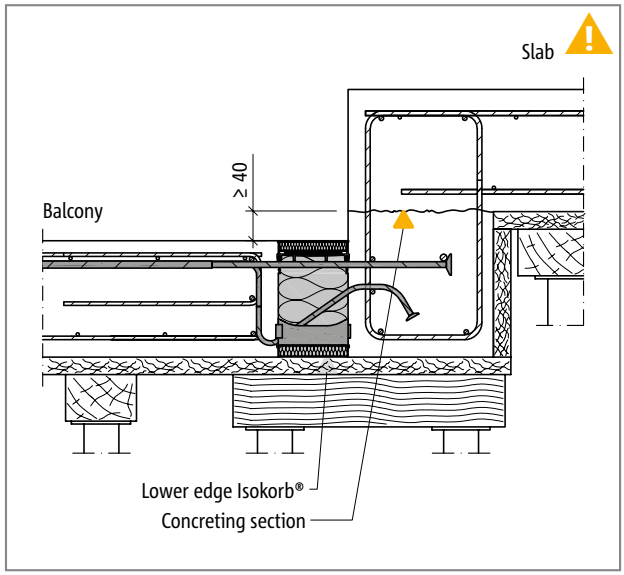


Fig. 117: Schöck Isokorb® XT type K-U: In-situ concrete balcony with height offset downwards

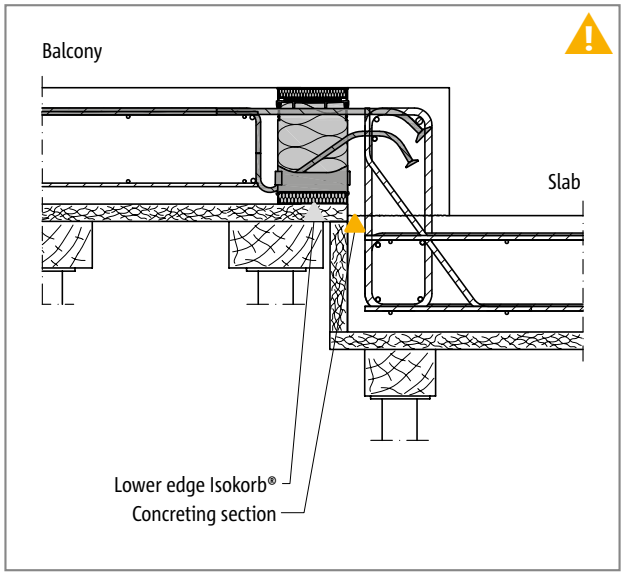


Fig. 118: Schöck Isokorb® XT type K-O: In-situ concrete balcony with height offset upwards

Hazard note: Tight fit with different height levels

The tight fit of the pressure bearings to the freshly poured concrete is to be ensured, therefore the upper edge of the masonry respectively of the concreting section is to be arranged below the lower edge of the Schöck Isokorb®. This is to be taken into account above all with a different height level between inner slab and balcony.

- The concreting joint and the upper edge of the masonry are to be arranged below the lower edge of the Schöck Isokorb®.
- The position of the concreting section is to be indicated in the formwork and reinforcement drawing.
- The joint planning is to be coordinated between precast concrete plant and construction site.

Installation instructions

- Download further installation instructions under www.schoeck.de/de/download

Check list

- ☐ 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?
- ☐ Has the additional proportionate deflection resulting from the Schöck Isokorb® been taken into account?
- ☐ Is the drainage direction taken into account with the resulting camber information? Is the degree of camber entered in the working drawings?
- ☐ Is the increased minimum slab thickness taken into account with CV50?
- ☐ Are the recommendations for the limitation of the slenderness observed?
- ☐ Are the maximum allowable expansion joint spacings taken into account?
- ☐ Are the Schöck FEM guidelines taken into account with the calculation using FEM?
- ☐ With the selection of the design table is the relevant concrete cover taken into account?
- ☐ 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?
- ☐ Are the requirements with regard to fire protection explained and is the appropriate addendum entered in the Isokorb® type description in the implementation plans?
- ☐ With the XT type K-U, K-O in conjunction with prefabricated floors is the insitu concrete strip required in the compression joint (width ≥ 100 mm from pressure element) plotted in the implementation plans?
- ☐ Is the required component geometry present with the connection to a floor or a wall? Is a special design required?
- ☐ Have the requirements for on-site reinforcement of connections been defined in each case?
- ☐ Is the on-site supplementary bar (Pos. 4) incorporated?
- ☐ 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?