

## Schöck Isokorb® T type SQ



### Schöck Isokorb® T type SQ

Load-bearing thermal insulation element for supported steel constructions with connection to reinforced concrete floors. The element transfers positive shear forces.

T  
type SQ

Steel – reinforced concrete



## Element arrangement | Installation cross sections

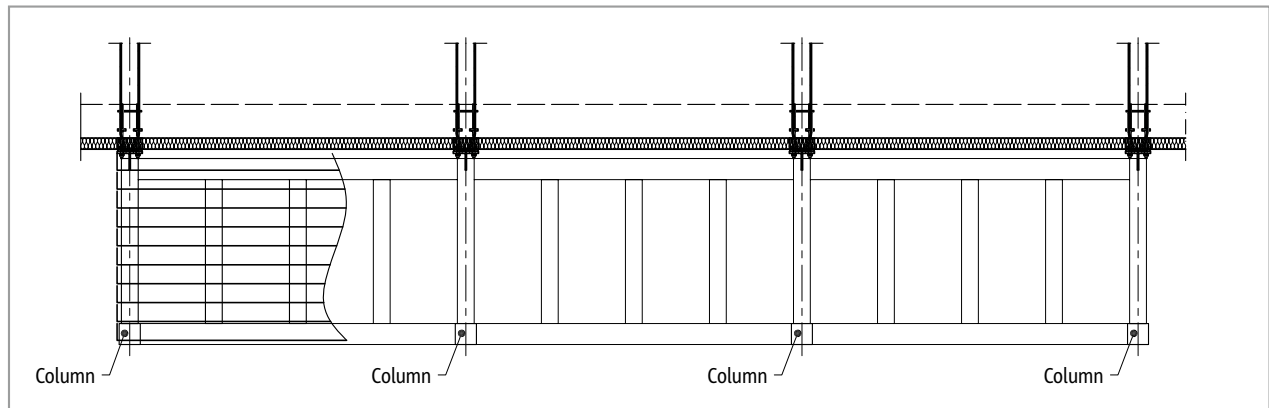


Fig. 53: Schöck Isokorb® T type SQ: Column supported balcony

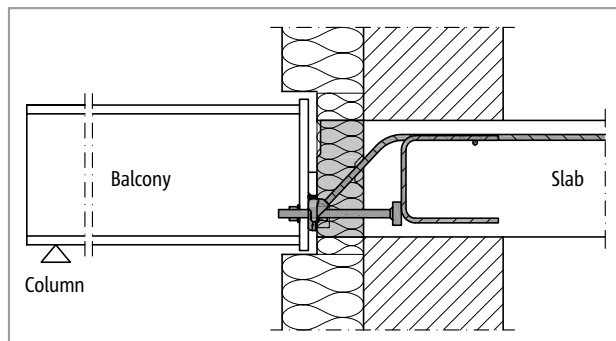


Fig. 54: Schöck Isokorb® T type SQ: Connection to reinforced concrete inner slab; insulating element within the core insulation zone.

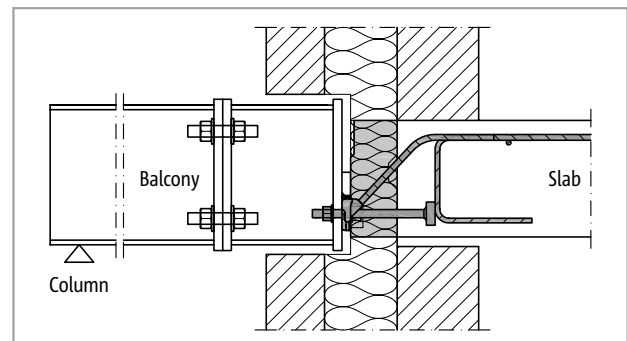


Fig. 55: Schöck Isokorb® T type SQ: Insulating element within the core insulation zone; steel stub adjuster between the Isokorb® and the balcony for flexible construction workflows

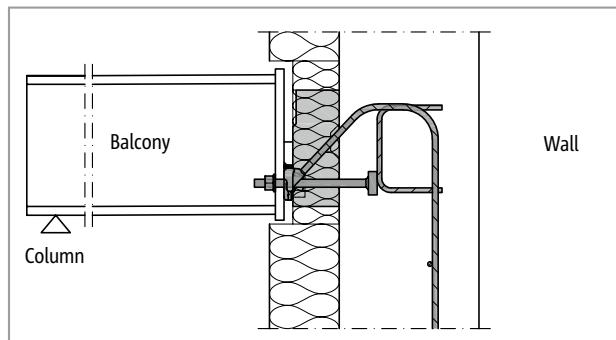


Fig. 56: Schöck Isokorb® T type SQ-WU: Special construction; required with connection to a reinforced concrete wall with a wall thickness from 200 mm

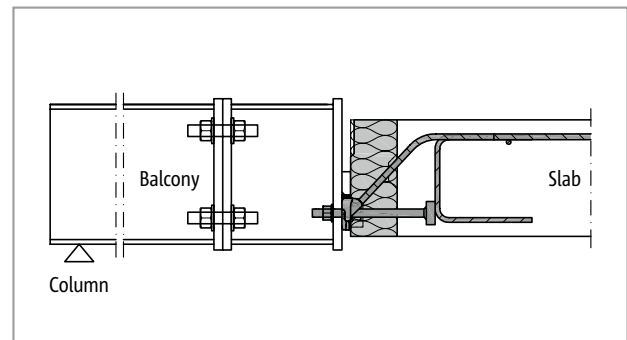


Fig. 57: Schöck Isokorb® T type SQ: Steel stub adjuster between the Isokorb® and the balcony supports flexible construction workflows

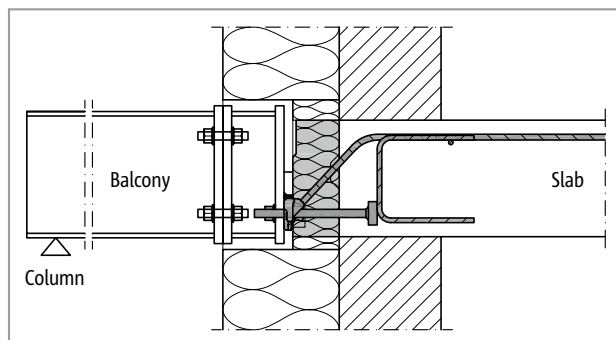


Fig. 58: Schöck Isokorb® T type SQ: Connection of the steel member to an adapter that equalises the thickness of the outer insulation

T  
type SQ

Steel – reinforced concrete

## Special designs

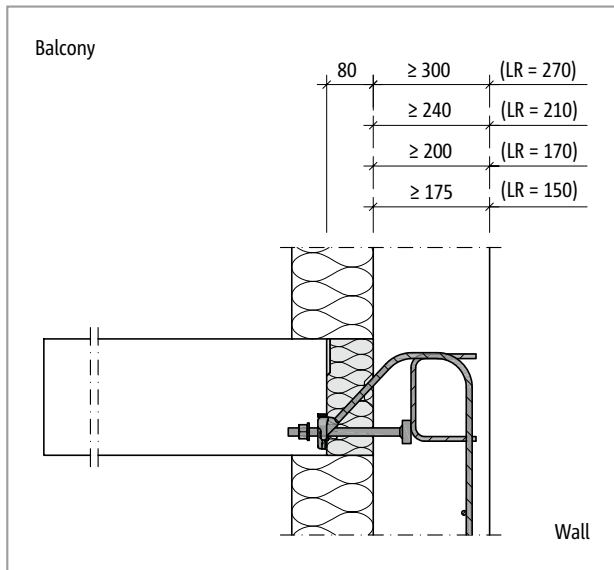


Fig. 59: Schöck Isokorb® T type SQ-WU: Special construction for wall connection

### Special designs

- The geometric dimensions presented can be implemented using special designs. Contact is the design support department.
- Design values can deviate from the standard products.
- The bond length LR for special constructions is to be carried in the type designation:  
T type SQ-V3-R0-LR270-X80-H200-L180-D16-1.0

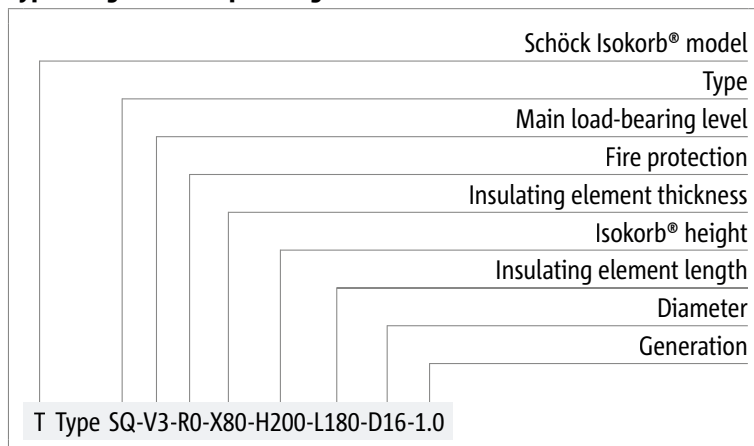
## Product selection | Type designations | Special designs | Sign convention

### Schöck Isokorb® T type SQ variants

The configuration of the Schöck Isokorb® T type SQ can be varied as follows:

- Main load-bearing level:  
Shear force level V1, V2, V3
- Fire resistance class:  
R 0
- Insulating element thickness:  
X80 = 80 mm
- Isokorb® Height:  
According to approval H = 180 mm to H = 280 mm, graduated in 10-mm steps
- Isokorb® length:  
L180 = 180 mm
- Thread diameter:  
D16 = M16
- Generation:  
1.0

### 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 for the design

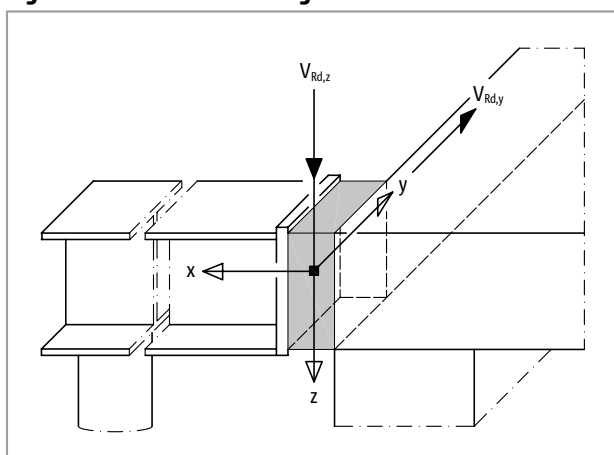


Fig. 60: Schöck Isokorb® T type SQ: Direction of internal forces and moments

## Design

### Design Schöck Isokorb® T type SQ

The application area of the Schöck Isokorb® T type SQ stretches over floor and balcony constructions with mainly static, evenly distributed traffic loads as per BS EN 1991-1-1, table 6.1. A static verification is to be presented for structural components adjoining on both sides of the Isokorb®. All variants of the Schöck Isokorb® T type SQ can transfer positive shear forces parallel to the z-axis. There are solutions for (lifting) shear forces using the Schöck Isokorb® T type SK.

Schöck Isokorb® T type SQ	V1	V2	V3
Design values with	$V_{Rd,z}$ [kN/element]		
	30.9	48.3	69.6
Concrete strength class $\geq$ C20/25	$V_{Rd,y}$ [kN/element]		
	$\pm 2.5$	$\pm 4.0$	$\pm 6.5$

Schöck Isokorb® T type SQ	V1	V2	V3
Placement with	Isokorb® length [mm]		
	180	180	180
Shear force bars	2 $\varnothing$ 8	2 $\varnothing$ 10	2 $\varnothing$ 12
Pressure bearing / compression bars	2 $\varnothing$ 14	2 $\varnothing$ 14	2 $\varnothing$ 14
Thread	M16	M16	M16

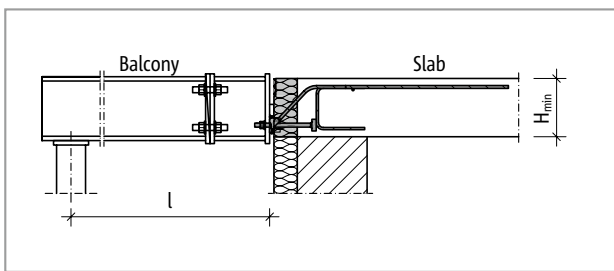


Fig. 61: Schöck Isokorb® T type SQ: Static system

### Notes on design

- Design values are taken in relation to the rear edge of the fixing plate.
- When using an indirect bearing solution for the Schöck Isokorb® T type SQ, the structural engineer must provide evidence, in particular, of the load transfer in the reinforced concrete component.
- The nominal dimension  $c_{nom}$  of the concrete cover as per BS EN 1992-1-1 (EC2), 4.4.1 and BS EN 1992-1-1/NA is 20 mm for internal areas.
- Edge and centre-to-centre distances are to be taken into account, see pages 52 and 53.

## Expansion joint spacing

### Maximum expansion joint spacing

Expansion joints must be provided in the external component. Changes in length due to temperature deformation are determined by the maximum distance ( $e$ ) from the centre of the outermost Schöck Isokorb® T type SQ. The balcony structure may overhang the outermost Schöck Isokorb® element. In the case of fixed points, such as corners, half the maximum distance ( $e$ ) from the fixed point applies. The calculation of the permissible expansion joint spacing is based on a reinforced concrete balcony slab that is securely connected to the steel members. If design measures have been implemented to ensure there is movement between the balcony slab and the individual steel members, then only the distances of the non-moving connections are relevant, see detail.

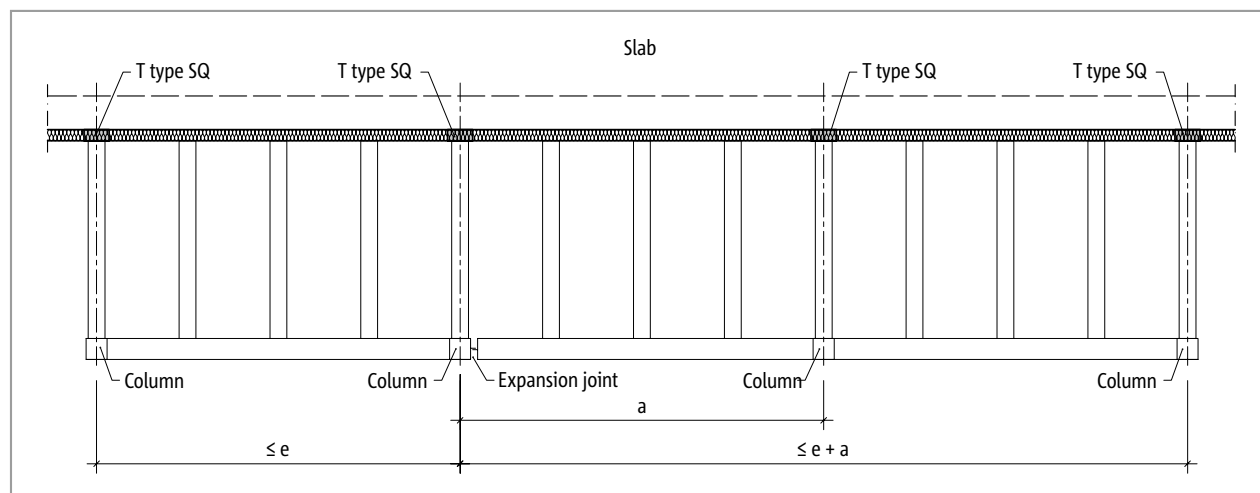


Fig. 62: Schöck Isokorb® T type SQ: Maximum expansion joint spacing  $e$  and lateral overhang  $a$

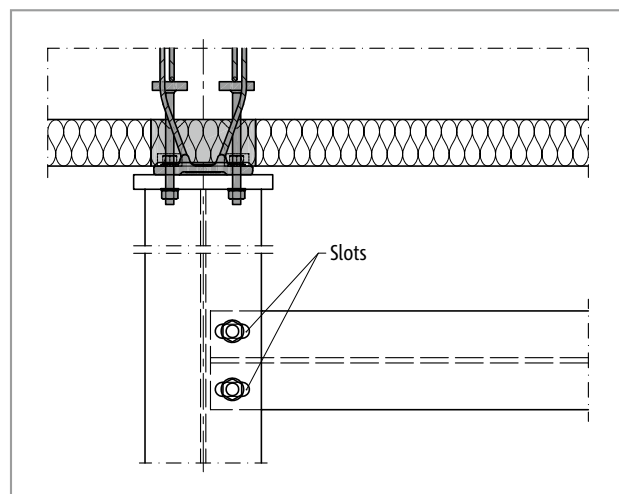


Fig. 63: Schöck Isokorb® T type SQ: Expansion joint detail to ensure movement during temperature expansion

Schöck Isokorb® T type SQ		V1 – V3
Maximum expansion joint spacing when		$e$ [m]
Insulating element thickness [mm]	80	5.7

### i Expansion joints

- If the expansion joint detail permanently permits temperature conditioned displacements of the cross member of length  $a$ , the expansion joint spacing may be extended to a maximum of  $e + a$ .

## Edge spacing

### Edge spacing

The Schöck Isokorb® T type SQ must be so positioned that minimum edge spacing in relation to the inner reinforced concrete elements are complied with:

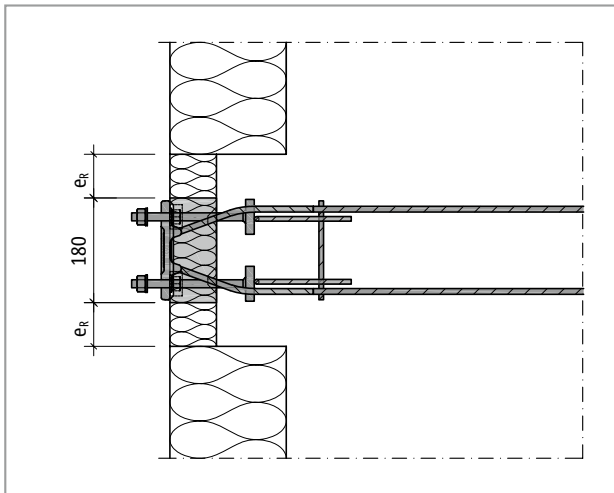


Fig. 64: Schöck Isokorb® T type SQ: Edge distances

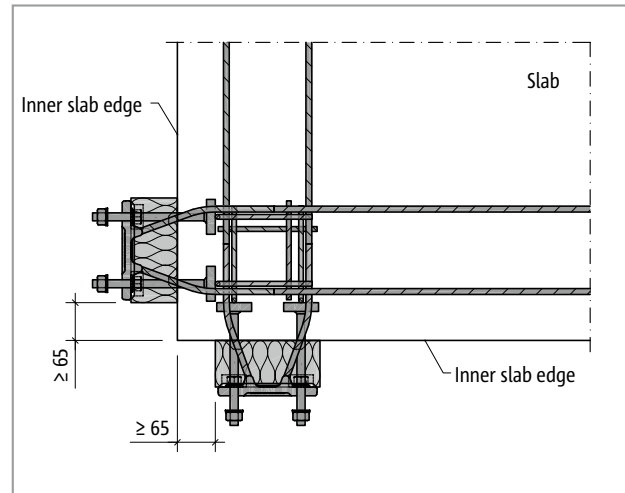


Fig. 65: Schöck Isokorb® T type SQ: Edge distances at the outer corner with Isokorbs® arranged vertically to each other

### Acceptable shear force $V_{Rd,z}$ depending on the edge distance

Schöck Isokorb® T type SQ		V1	V2	V3
Design values with		Concrete strength class $\geq C20/25$		
Isokorb® height H [mm]	Edge distance $e_R$ [mm]	$V_{Rd,z}$ [kN/element]		
180–190	$30 \leq e_R < 74$	14,2	20,4	28,5
200–210	$30 \leq e_R < 81$			
220–230	$30 \leq e_R < 88$			
240–280	$30 \leq e_R < 95$			
180–190	$e_R \geq 74$	No reduction required		
200–210	$e_R \geq 81$			
220–230	$e_R \geq 88$			
240–280	$e_R \geq 95$			

#### 1 Edge distances

- Edge distances  $e_R < 30$  mm are not permitted!
- If two Isokorb® T type SQ are arranged vertically to each other at a corner, edge distances  $e \geq 65$  mm are required.



## Centre-to-centre distances | Concrete cover

### Centre-to-centre distances

The Schöck Isokorb® T type SQ must be so positioned that minimum centre-to-centre distances of Isokorb® to Isokorb® are complied with:

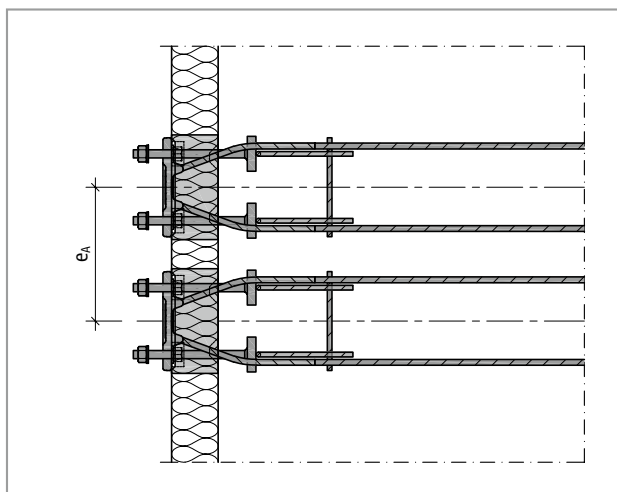


Fig. 66: Schöck Isokorb® T type SQ: Centre-to-centre distance

### Design internal forces depending on the centre-to-centre distance

Schöck Isokorb® T type SQ		V1 – V3
Design values with		Concrete strength class $\geq$ C20/25
Isokorb® height H [mm]	Centre-to-centre distance $e_A$ [mm]	$V_{Rd,z}$ [kN/element]
180–190	$e_A \geq 230$	No reduction required
200–210	$e_A \geq 245$	
220–230	$e_A \geq 255$	
240–280	$e_A \geq 270$	

### i Centre-to-centre distances

#### Upper concrete cover

Schöck Isokorb® T type SQ		V1	V2	V3
Concrete cover with		CV [mm]		
Isokorb® height H [mm]	180	26	24	34
	190	36	34	44
	200	26	24	34
	210	36	34	44
	220	26	24	34
	230	36	34	44
	240	26	24	34
	250	36	34	44
	260	46	44	54
	270	56	54	64
	280	66	64	74

## Product description

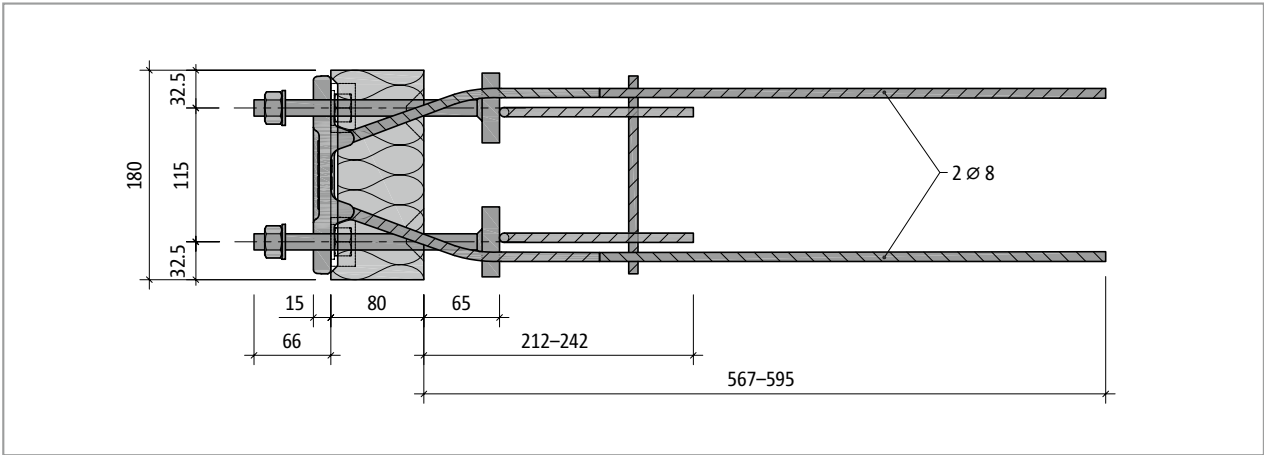


Fig. 67: Schöck Isokorb® T type SQ-V1: Plan view

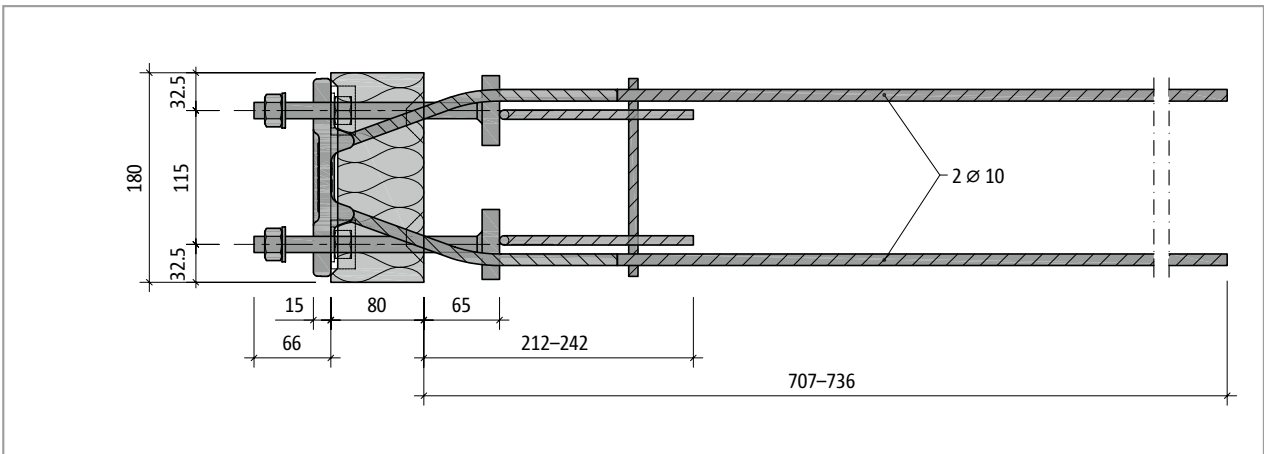


Fig. 68: Schöck Isokorb® T type SQ-V2: Plan view

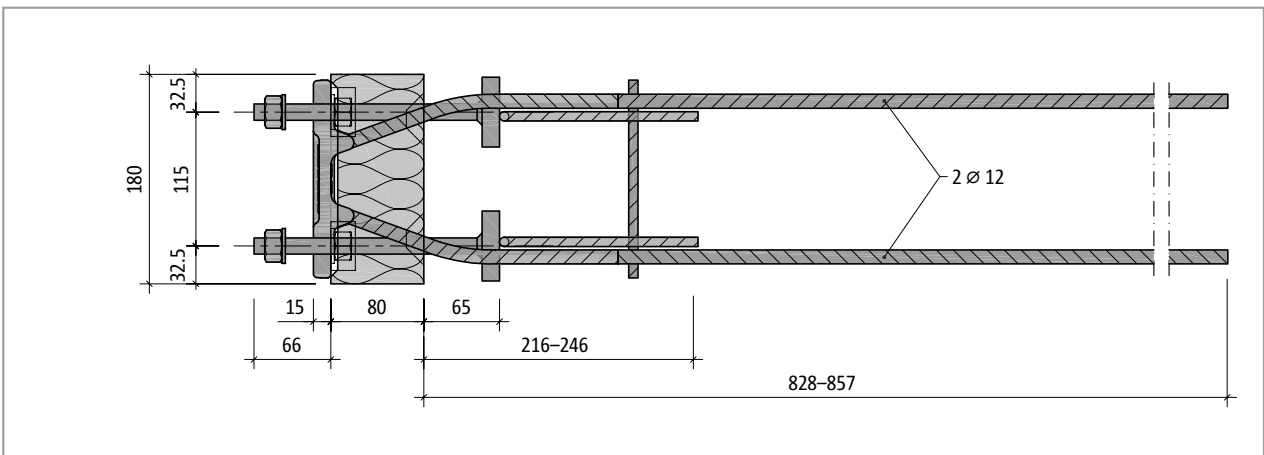


Fig. 69: Schöck Isokorb® T type SQ-V3: Plan view

### Product information

- The free clamping distance on T type SQ is 30 mm.

## Product description

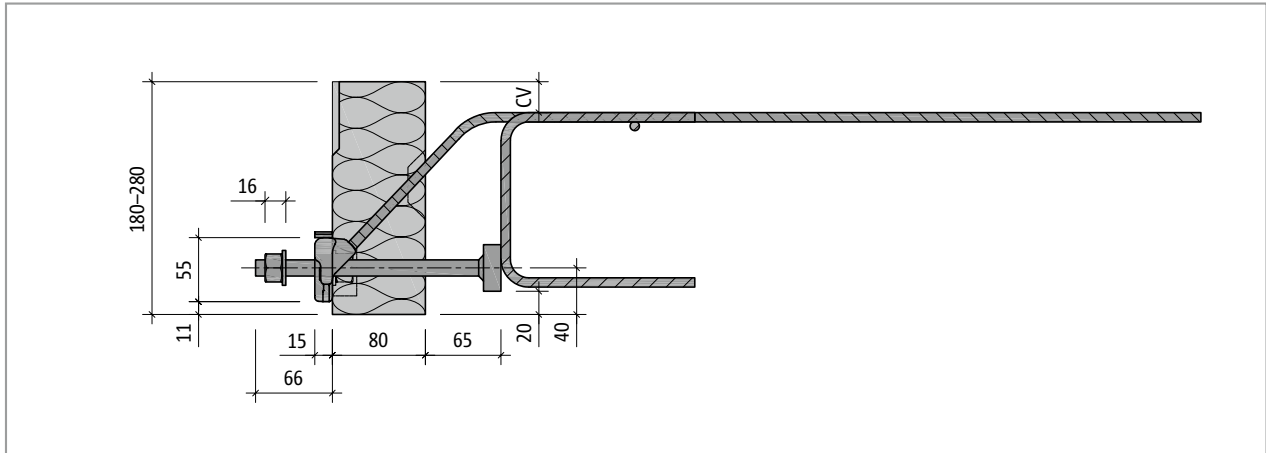


Fig. 70: Schöck Isokorb® T type SQ-V1: Cross section of the product

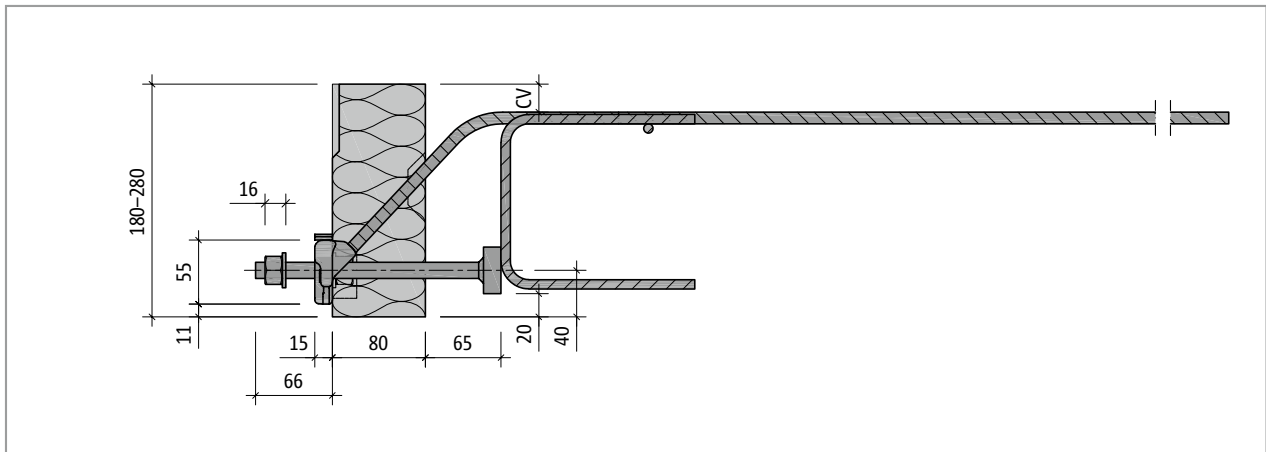


Fig. 71: Schöck Isokorb® T type SQ-V2: Cross section of the product

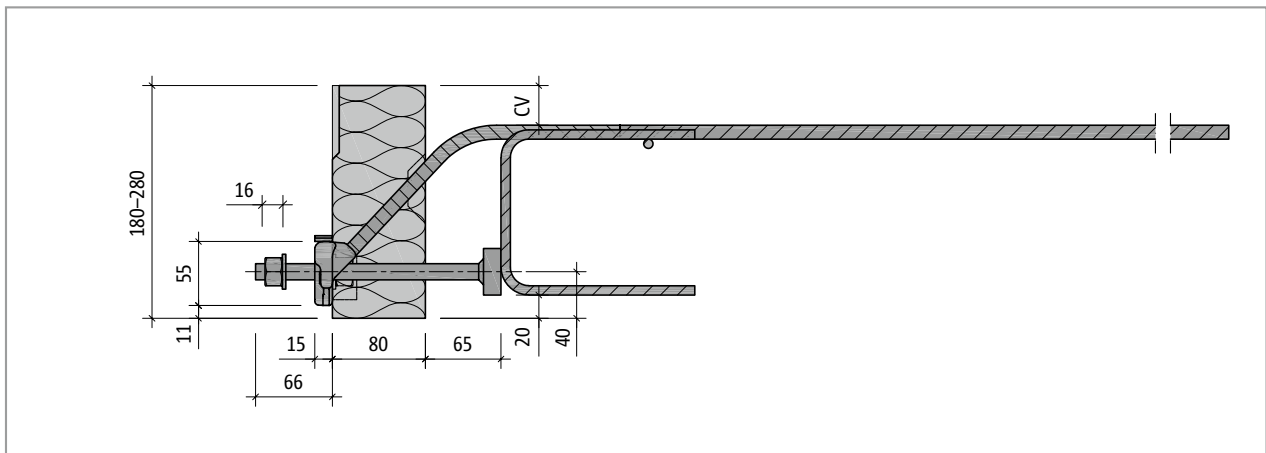


Fig. 72: Schöck Isokorb® T type SQ-V3: Cross section of the product

### Product information

- The free clamping distance on T type SQ is 30 mm.
- Concrete cover of the shear force bars CV, see page 53.

T  
type SQ

Steel – reinforced concrete

## On-site reinforcement - in-situ concrete construction

### Schöck Isokorb® T type SQ

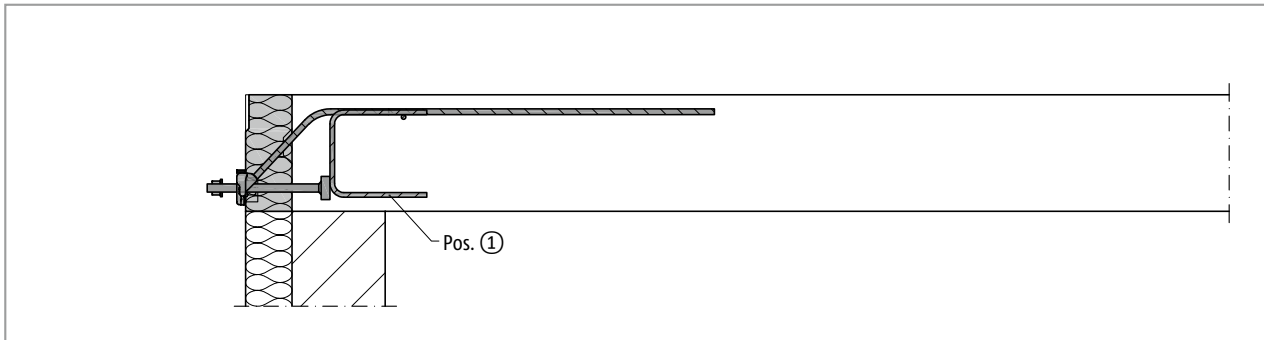


Fig. 73: Schöck Isokorb® T type SQ: On-site reinforcement: Cross section

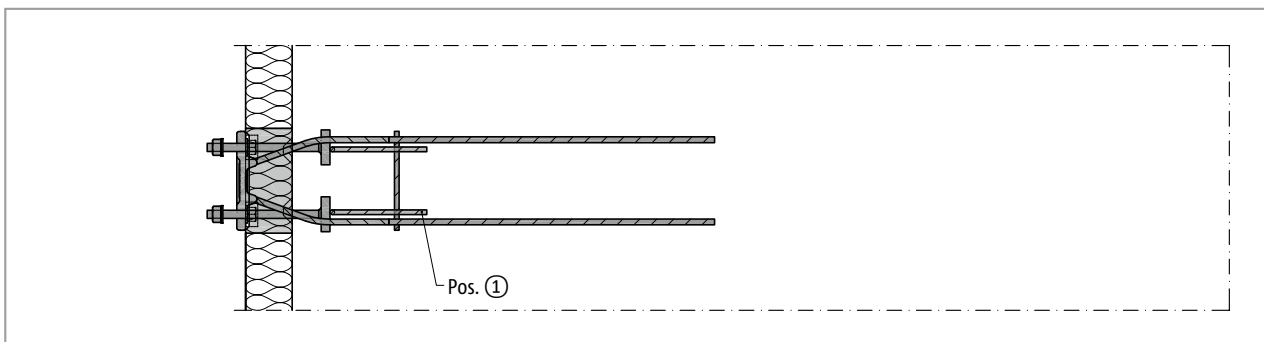


Fig. 74: Schöck Isokorb® T type SQ: On-site reinforcement: Plan view

Schöck Isokorb® T type SQ			V1	V2	V3
On-site reinforcement	Type of bearing	Height H [mm]	Floor slab (XC1) concrete grade $\geq$ C25/30 Balcony steel structure		
Edge and splitting tensile reinforcement					
Pos. 1	direct/indirect	180–280	included with the product		

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

- The straight legs of the shear force rods must be lapped to the reinforced concrete slab reinforcement. The lap lengths must comply with BS EN 1992-1-1 (EC2), Section 8.4.

## On-site reinforcement - precast construction

### Schöck Isokorb® T type SQ

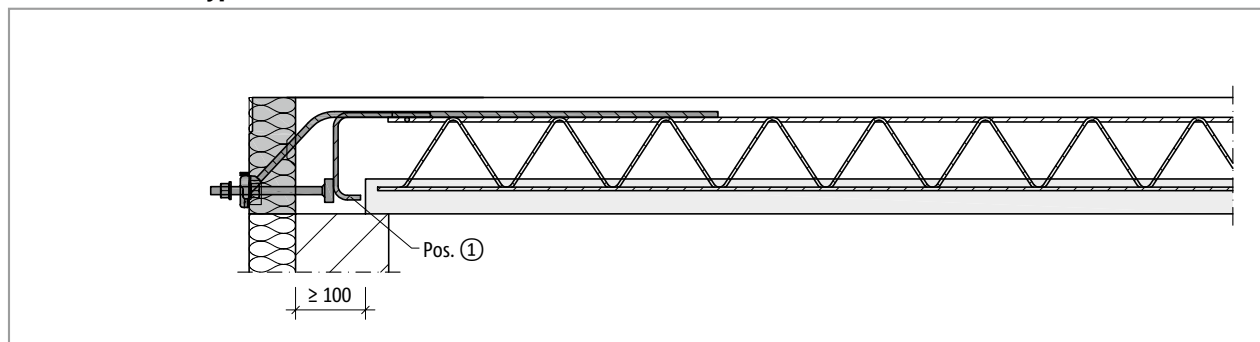


Fig. 75: Schöck Isokorb® T type SQ: On-site reinforcement for semi-precast construction: Cross section

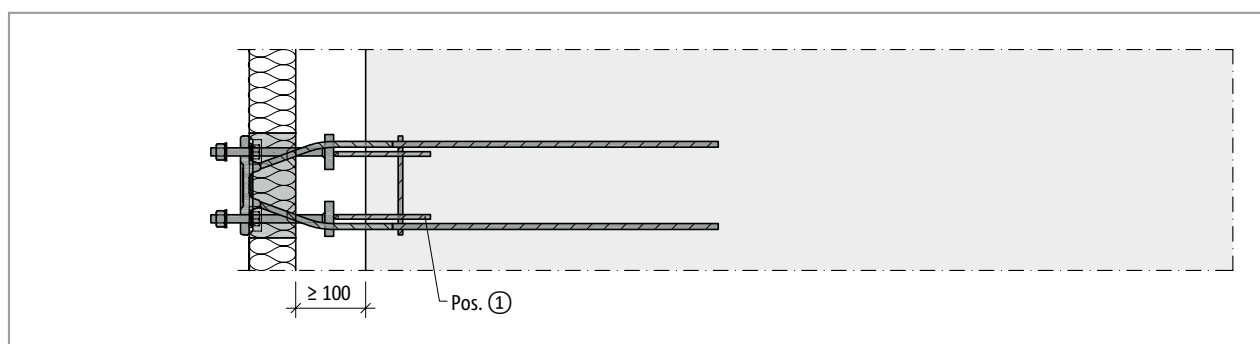


Fig. 76: Schöck Isokorb® T type SQ: On-site reinforcement for semi-precast construction: Plan view

Schöck Isokorb® T type SQ			V1	V2	V3
On-site reinforcement	Type of bearing	Height H [mm]	Floor slab (XC1) concrete grade $\geq$ C25/30 Balcony steel structure		
Edge and splitting tensile reinforcement					
Pos. 1	direct/indirect	180–280	available on the product side, alternatively implementation using on-site stirrups 2 H 8		

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

- The straight legs of the shear force rods must be lapped to the reinforced concrete slab reinforcement. The lap lengths must comply with BS EN 1992-1-1 (EC2), Section 8.4.
- If composite pre-cast flooring is being installed, the lower legs of the factory-supplied links can be shortened on site and replaced with two suitable  $\varnothing 8$  stirrups.

## End Plate

### T Type SQ for transferring positive shear forces

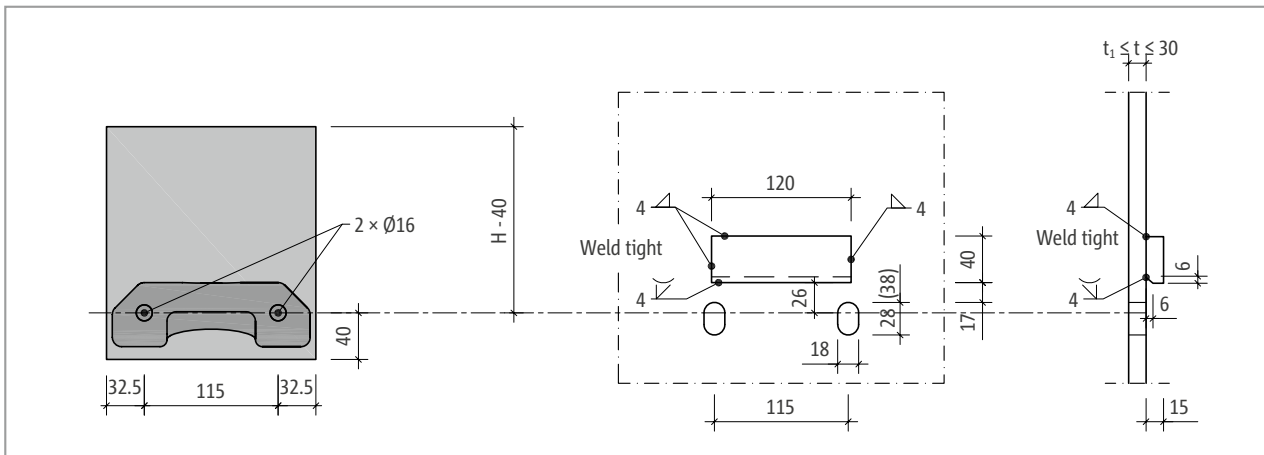


Fig. 77: Schöck Isokorb® T type SQ: Design of the fixing plate connection

The choice of fixing plate thickness  $t$  is determined by the minimum thickness  $t_1$  as specified by the structural engineer. This thickness must not, however, be greater than the clamping distance of the Schöck Isokorb® T type SQ, which is 30 mm.

#### End Plate

- The illustrated elongated holes allow an uplifting of the endplate of up to 10 mm. The values shown in brackets allow for the increase of the tolerances of up to 20 mm.
- If horizontal forces  $V_{Ed,y} > 0.342 \cdot \min. V_{Ed,z}$  appear parallel to the insulation joint, it is necessary to fit the end plate with circular holes  $\varnothing 18$  mm instead of slotted holes for the further transfer of the loads.
- The structural engineer must specify the overall dimensions of the fixing plate
- The construction drawing must contain the tightening torque for the nuts, which is specified as follows:  
T type SQ (threaded rod M16 - wrench size  $s = 24$  mm):  $M_r = 50$  Nm
- The Schöck Isokorb® embedded in concrete are to be measured in-situ before the front slabs are produced.

## On-site butt stop

### On-site butt stop

The on-site butt stop is absolutely crucial for transferring shear forces from the on-site front slab to the Isokorb® T type SQ! The spacer shims supplied by Schöck are used for vertical adjustment between butt stop and Schöck Isokorb®.

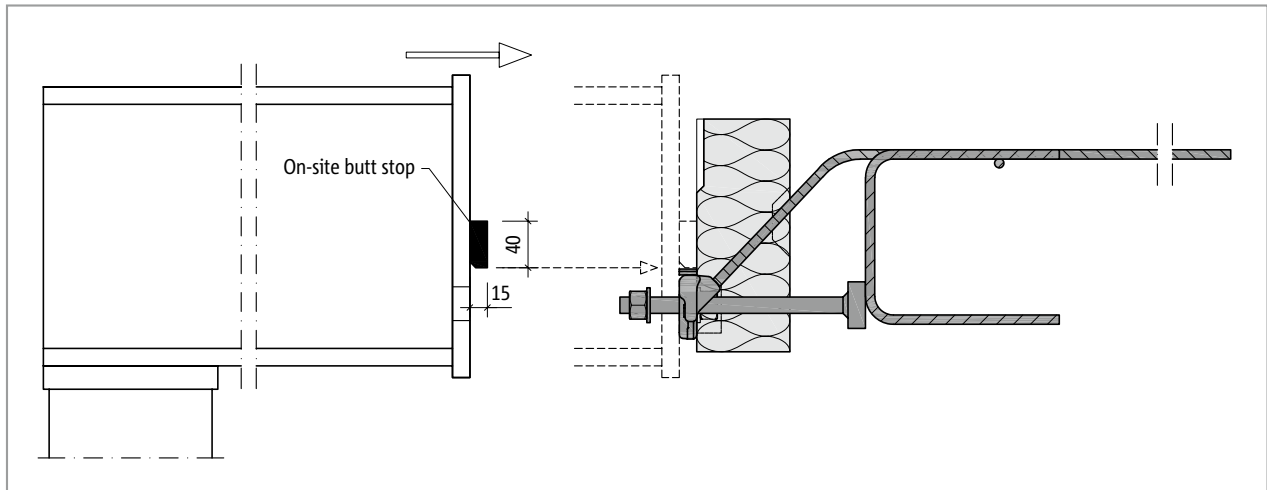


Fig. 78: Schöck Isokorb® T type SQ: Mounting the steel member

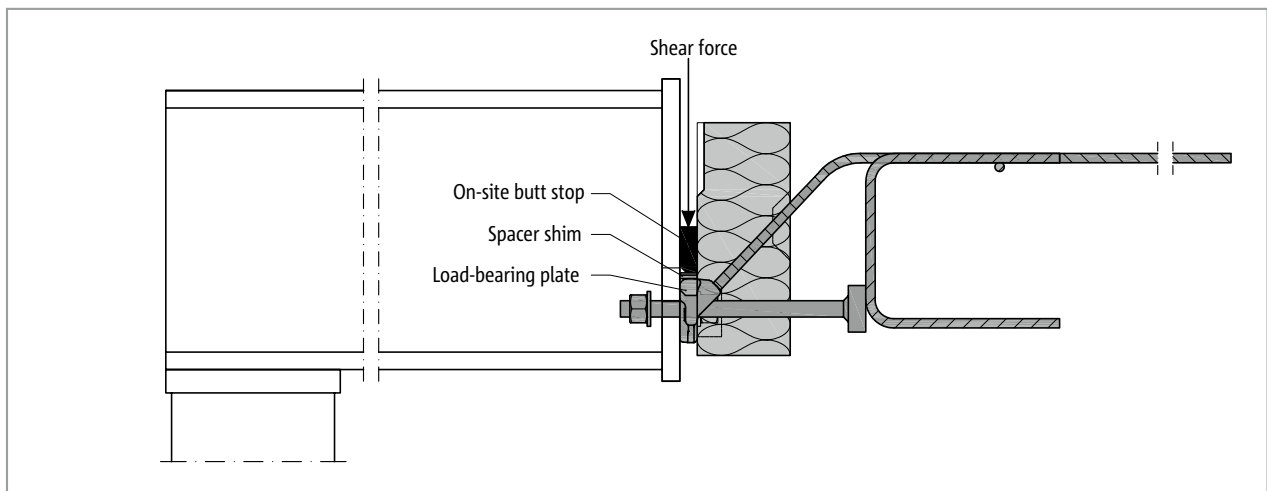


Fig. 79: Schöck Isokorb® T type SQ: On-site butt stop for transferring shear forces

#### **i** On-site butt stop

- Type of steel to match static requirements.
- Apply corrosion protection after welding.
- Steel construction: Checking for dimensional inaccuracy of the structure prior to fabrication is absolutely essential!

#### **i** Spacer shims

- Details of dimensions and materials, see page 16
- With installation ensure they are free from burrs and are even.

## Type of bearing: supported | Installation instructions

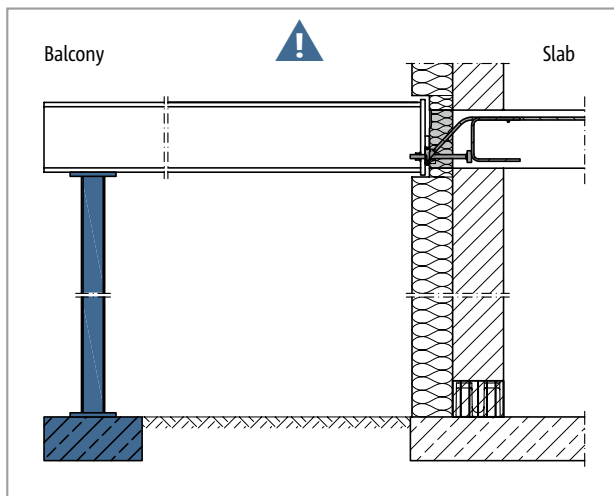


Fig. 80: Schöck Isokorb® T type SQ: Continuous support needed

### **i** Supported balcony

The Schöck Isokorb T Type SQ is developed for supported balconies. It only transfers shear forces, no bending moments.

### **⚠** Hazard warning - missing supports

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

### **i** Installation instructions

The current installation instruction can be found online under:  
[www.schoeck.com/view/2743](http://www.schoeck.com/view/2743)



## ✓ Check list

### Check list for structural engineers

- Has the right type of Schöck Isokorb® been selected for the static system? T Type SQ is a connection purely for shear forces (moment joint).
- Have the loads on the Schöck Isokorb® connection been specified at design level?
- Is there a situation in which, during the construction phase, the construction had to be dimensioned for an emergency or a special load?
- Have the fire protection requirements for the overall load-bearing structure been clarified? Are the on-site measures included in the construction drawings?
- Does a connection to a wall or with height offset necessitate the use of Isokorb® T type SQ-WU instead of T type SQ (see page 47) or another special design?
- Are temperature deformations directly attributed to the Isokorb® connection and has the maximum expansion joint spacing been taken into consideration in this respect?
- Is compliance with the conditions and dimensions of the on-site fixing plate assured?
- Do the construction drawings contain sufficient reference to the essential on-site butt stop?
- Has the cutout on the inner slab side been taken into account if using the Isokorb® T type SQ in precast element slabs?
- Has reasonable agreement been reached between the concrete contractor and steel constructor with regard to the accuracy of installation of the Isokorb® T type SQ?
- Has the information about the required installation accuracy been incorporated into the concrete frame designs for the construction supervisor and the concrete contractor?
- Are the tightening torques for the screwed connections noted in the construction drawings?

### Check list for concrete contractor

- Does a formwork concept exist for developing an on-site template for installing the Isokorb®?
- Is Schöck's installation aid required to ensure best possible correct sitting and alignment of the Isokorb®?
- Are you in contact with the steel constructor to discuss the required accuracy of the Isokorb® installation?

### Check list for steel constructors

- Has the position of the installed Isokorb® in the building structure been measured to determine the height of the on-site butt stop?
- Do the fixing plates of the adapters contain the necessary vertical/horizontal slots for on-site tolerance?
- Is the on-site butt stop present on the fixing plate for connecting the steel member to the Isokorb®?
- Has the gradient of the steel member been adjusted to incorporate the water drainage direction?
- Has the necessary tightening moment for the nuts on the Isokorb® been taken into consideration?  
T type SQ-V2, T type SQ-V3 (M16 thread):  $M_r = 50 \text{ Nm}$

