Schöck Isokorb® T type SQ

Schöck Isokorb® T type SQ
Suitable for supported steel balconies and canopies. It transfers positive shear forces.

Element arrangement | Installation cross sections

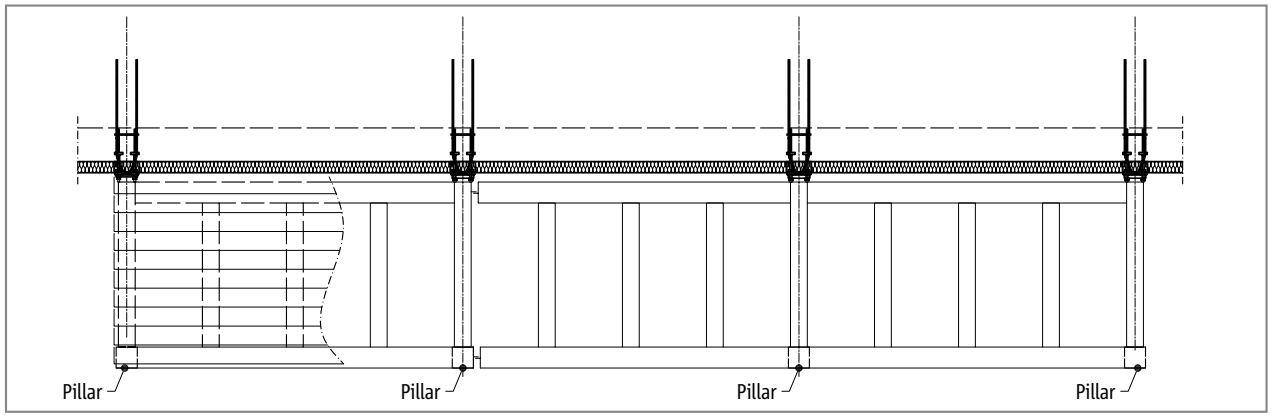


Fig. 52: Schöck Isokorb® T type SQ: Pillar supported balcony

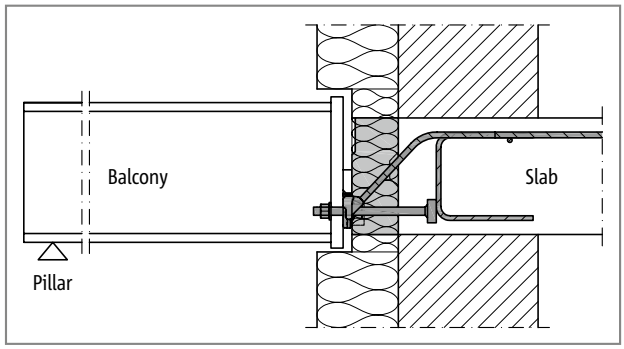


Fig. 53: Schöck Isokorb® T type SQ: Connection to reinforced concrete inner slab; insulating element within the core insulation zone.

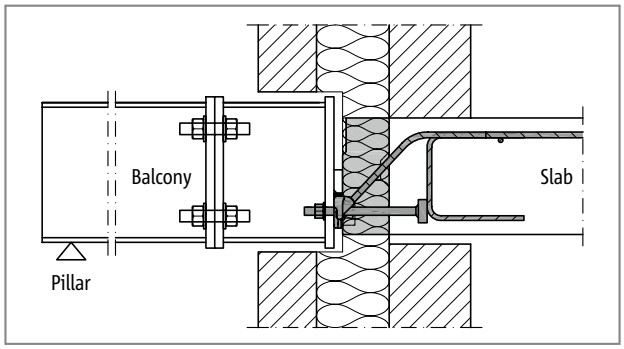


Fig. 54: Schöck Isokorb® T type SQ: Insulating element within the core insulation zone; steel stub adjuster between the Isokorb® and the balcony for flexible construction workflows

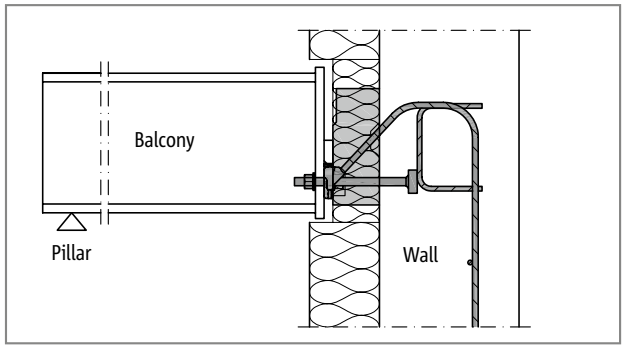


Fig. 55: Schöck Isokorb® T Type SQ-WU: Special design; required for the connection to a reinforced concrete wall

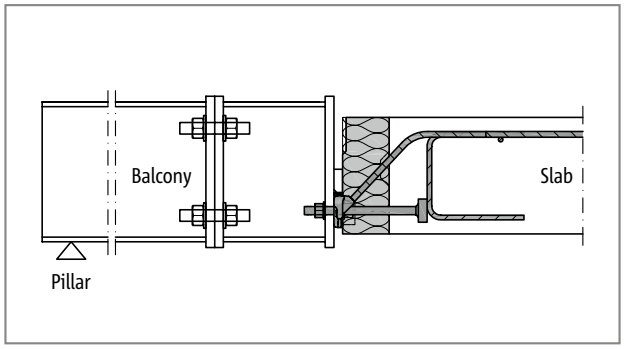


Fig. 56: Schöck Isokorb® T type SQ: Steel stub adjuster between the Isokorb® and the balcony supports flexible construction workflows

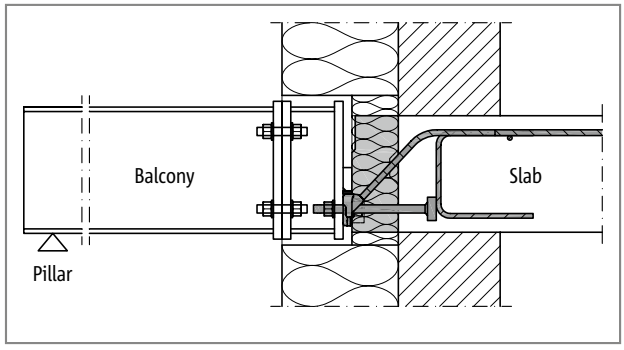


Fig. 57: Schöck Isokorb® T type SQ: Connection of the steel member to an adapter that equalises the thickness of the outer insulation

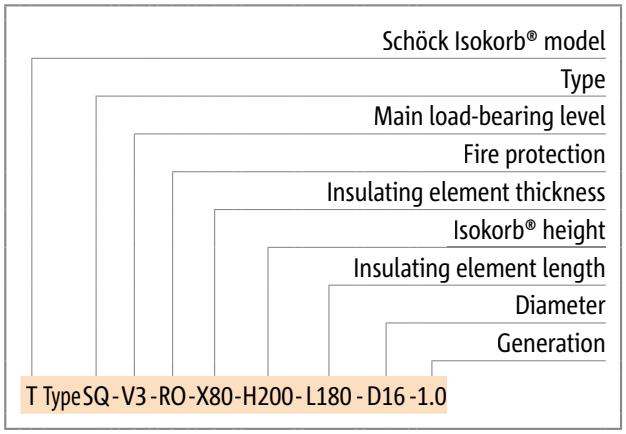
Product selection | Type designations | Special designs | Design force direction

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:
  R0
- 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).

Direction of forces

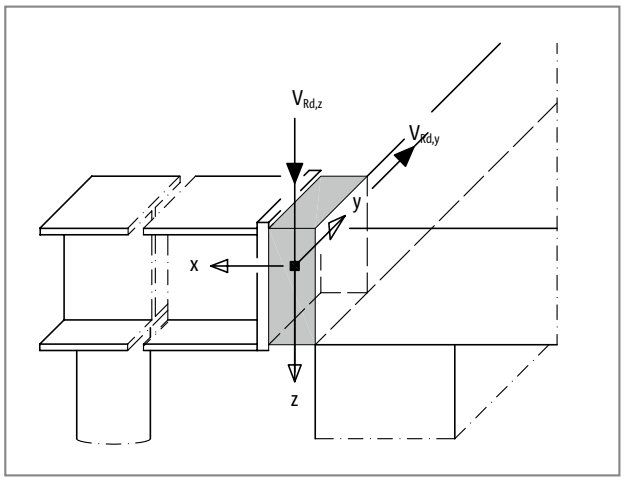


Fig. 58: Schöck Isokorb® T type SQ: Direction of internal forces and moments

Design

Schöck Isokorb® T type SQ: Design

Area of application of the Schöck Isokorb® T type SQ covers floor and balcony slab structures with predominantly static, evenly distributed live loads according to BS EN 1991-1-1/NA2 or NA 3. Static verification is to be produced for the components connecting to both sides of the Isokorb®. All Isokorb® T type SQ variants can transfer positive shear forces parallel to the z axis. The Isokorb® type SK offers solutions for negative (lifting) shear forces.

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

Isokorb® length [mm]	180	180	180
Shear force bars	2 ⌀ 8	2 ⌀ 10	2 ⌀ 12
Pressure bearing / compression bars	2 ⌀ 14	2 ⌀ 14	2 ⌀ 14
Thread	M16	M16	M16

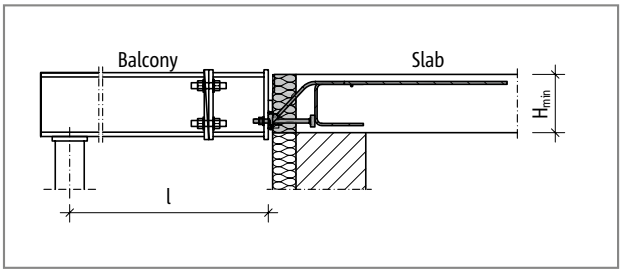


Fig. 59: Schöck Isokorb® T type SQ: Static system

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.

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.

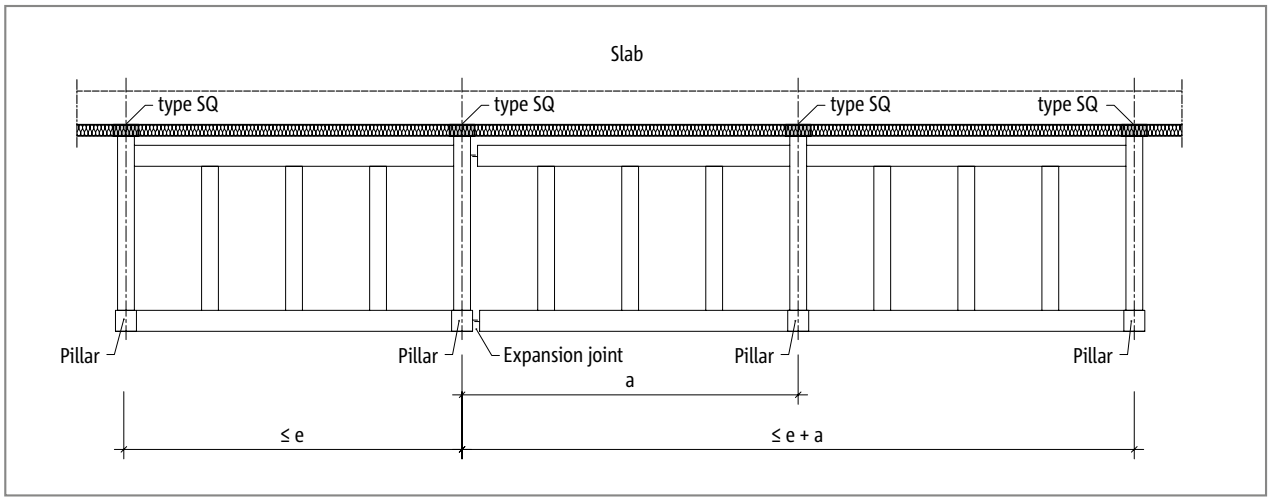


Fig. 60: Schöck Isokorb® T type SQ: Maximum expansion joint spacing e and lateral overhang a

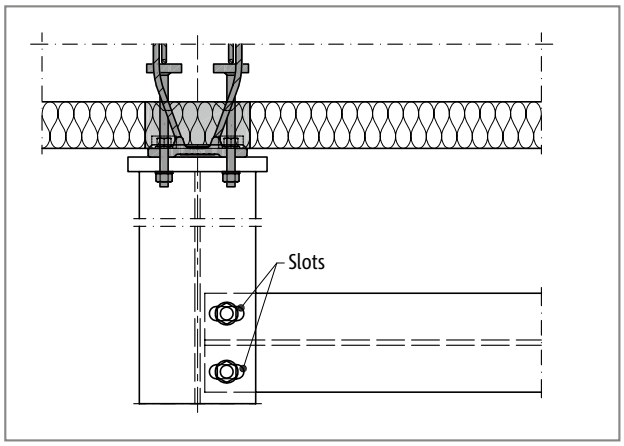


Fig. 61: Schöck Isokorb® T type SQ: Expansion joint detail to ensure movement during temperature expansion

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

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 distances related to the inner reinforced concrete structural element are maintained:

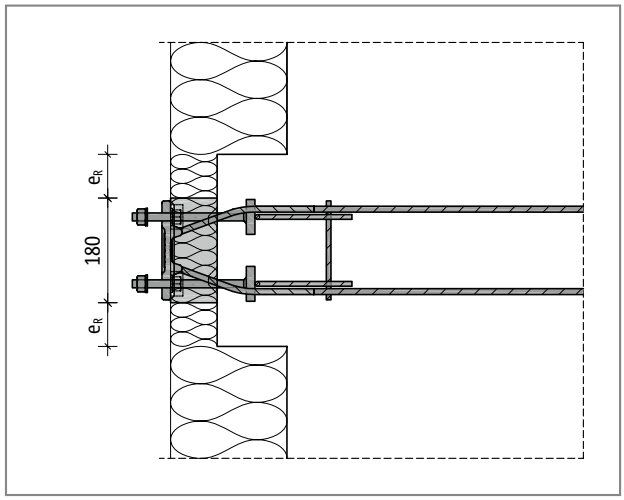


Fig. 62: Schöck Isokorb® T type SQ: Edge distances

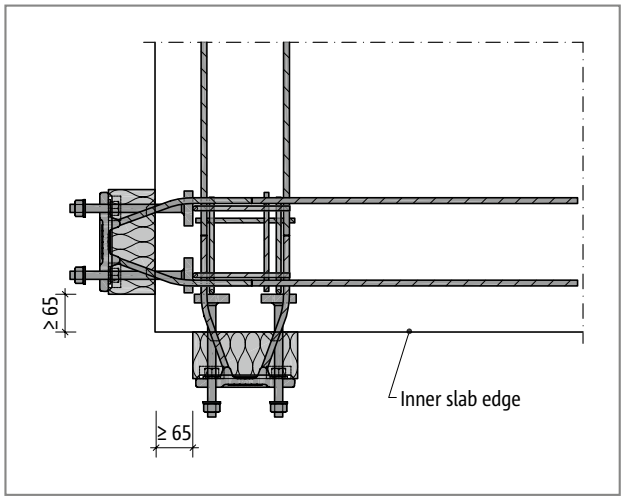


Fig. 63: Schöck Isokorb® T type SQ: Edge distances at the outer corner with Isokorbs® arranged vertically to each other

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 ≥ C20/25		
Isokorb® height H [mm]	Edge distance e_R [mm]	$V_{Rd,z}$ [kN/element]		
180 - 190	30 ≤ e_R < 74	14,2	20,4	28,5
200 - 210	30 ≤ e_R < 81			
220 - 230	30 ≤ e_R < 88			
240 - 280	30 ≤ e_R < 95			
180 - 190	e_R ≥ 74	No reduction required		
200 - 210	e_R ≥ 81			
220 - 230	e_R ≥ 88			
240 - 280	e_R ≥ 95			

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 ≥ 65 mm are required.

Centre-to-centre distances

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 maintained:

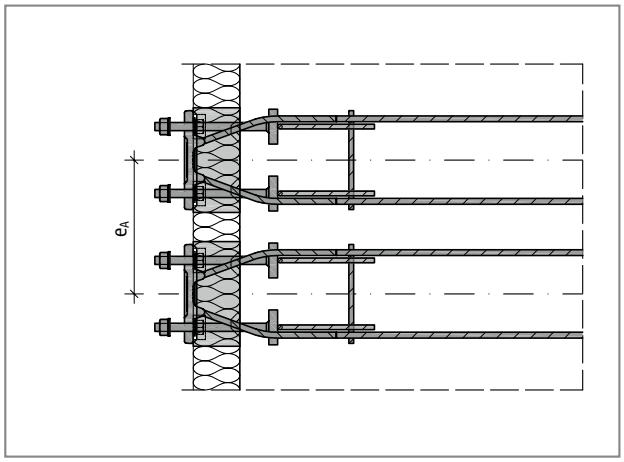


Fig. 64: Schöck Isokorb® T type SQ: Centre-to-centre distance

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

Schöck Isokorb® T type SQ		V1 - V3
Design values with		Concrete strength class ≥ 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	$e_A \geq 270$	

Centre-to-centre distances

- With the exceeding of the axis distance e_A the load-bearing capacity of the type SQ is to be reduced.
- Please contact the design support department at Schöck for the reduced design values. Contact see page 3.

Product description

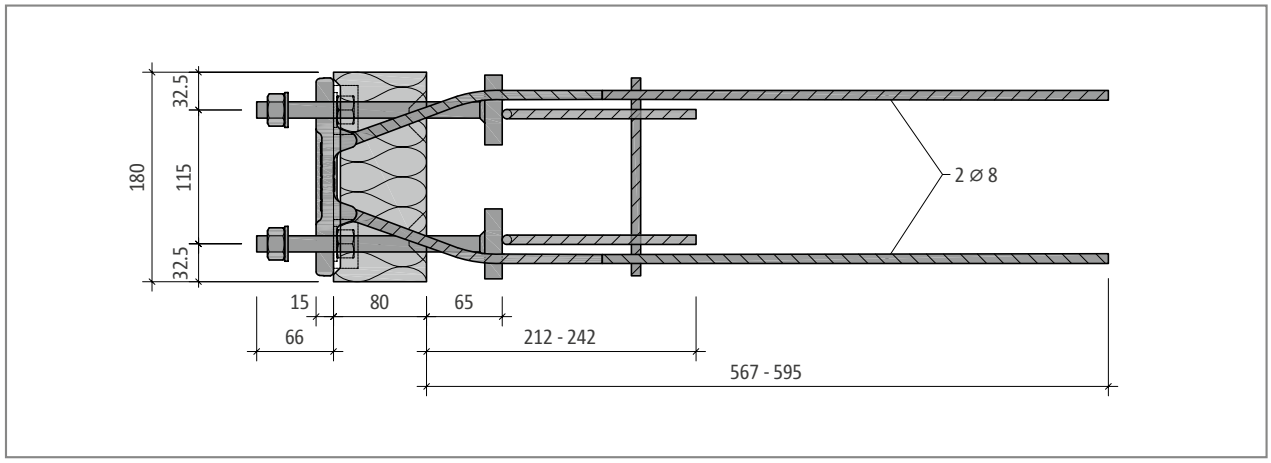


Fig. 65: Schöck Isokorb® T type SQ-V1: Plan view

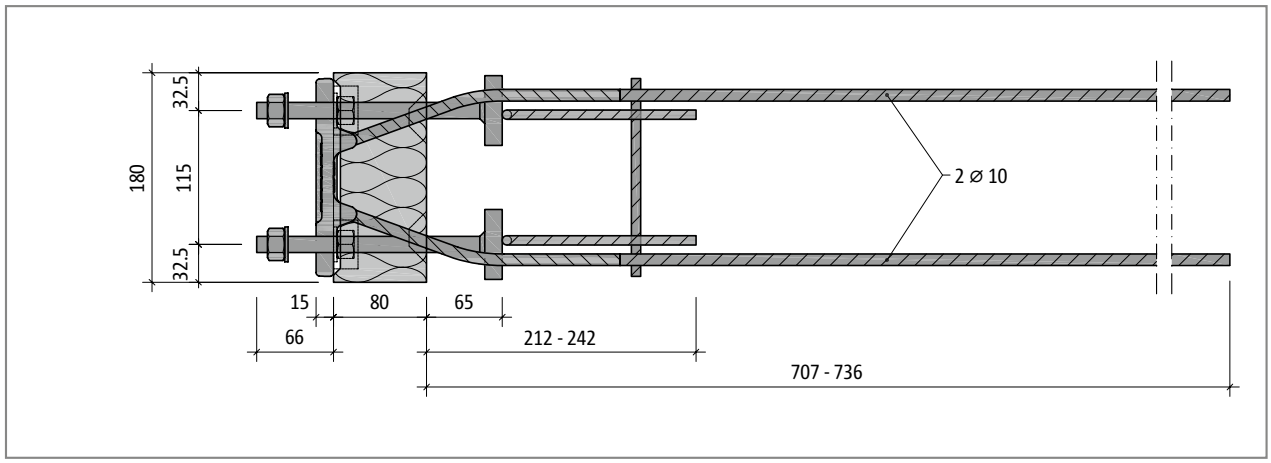


Fig. 66: Schöck Isokorb® T type SQ-V2: Plan view

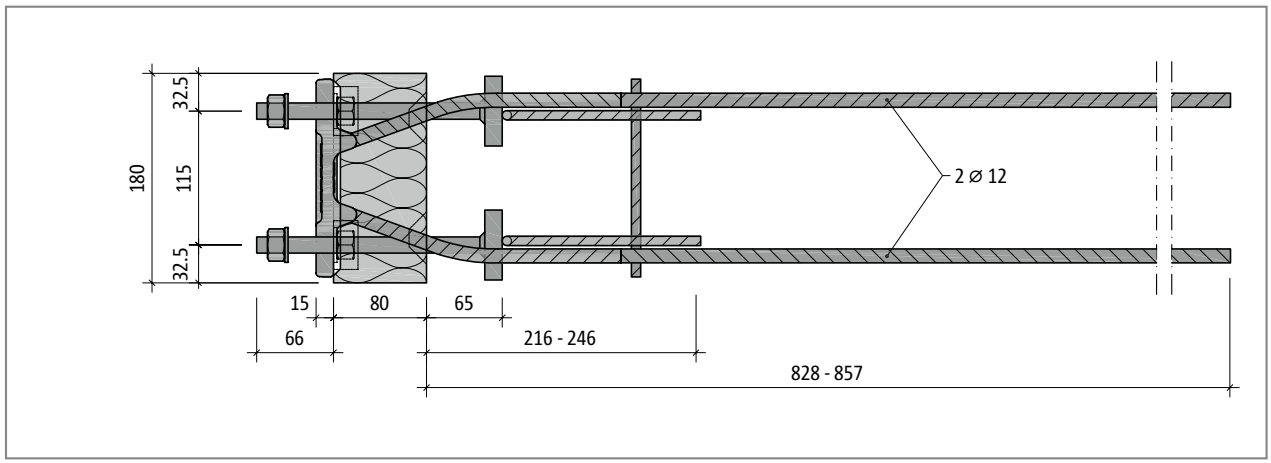


Fig. 67: Schöck Isokorb® T type SQ-V3: Plan view

Product information

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

Product description

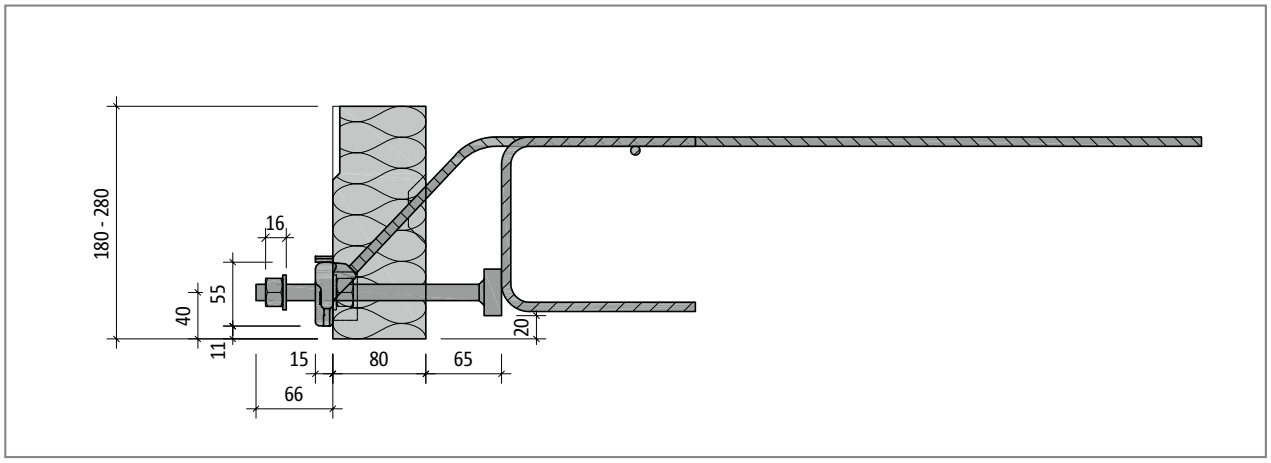


Fig. 68: Schöck Isokorb® T type SQ-V1: Cross section of the product

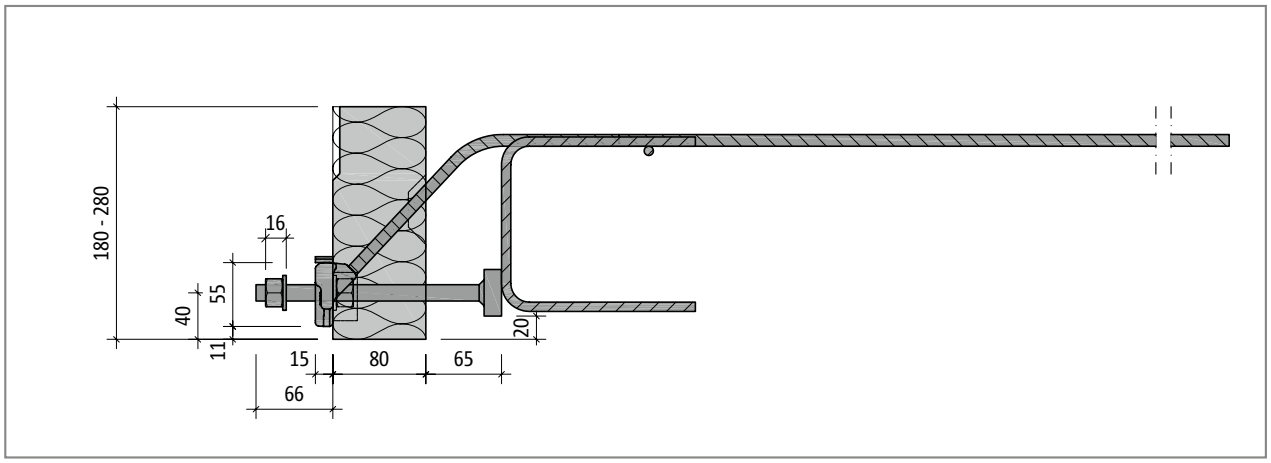


Fig. 69: Schöck Isokorb® T type SQ-V2: Cross section of the product

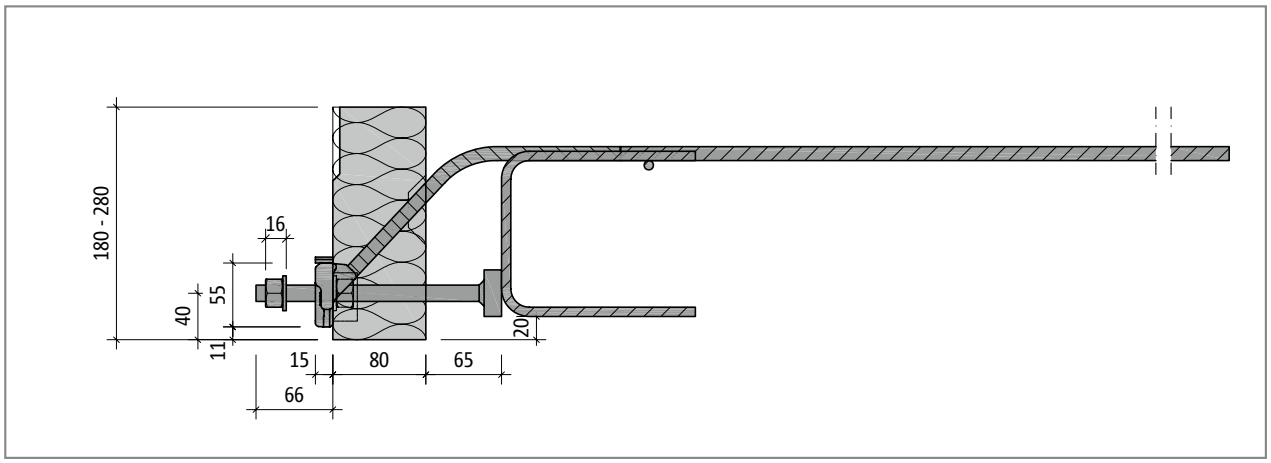


Fig. 70: Schöck Isokorb® T type SQ-V3: Cross section of the product

Product information

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

On-site reinforcement - In-situ concrete construction

Schöck Isokorb® T type SQ

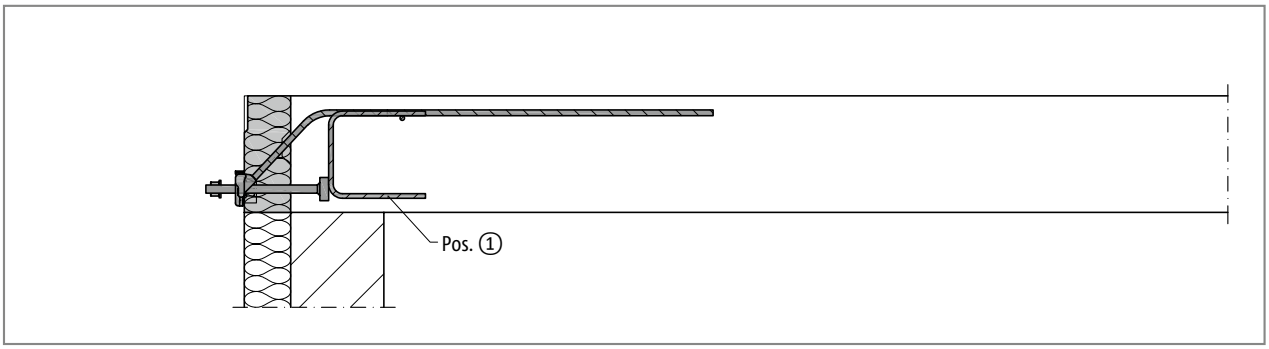


Fig. 71: Schöck Isokorb® T type SQ: On-site reinforcement: Cross section

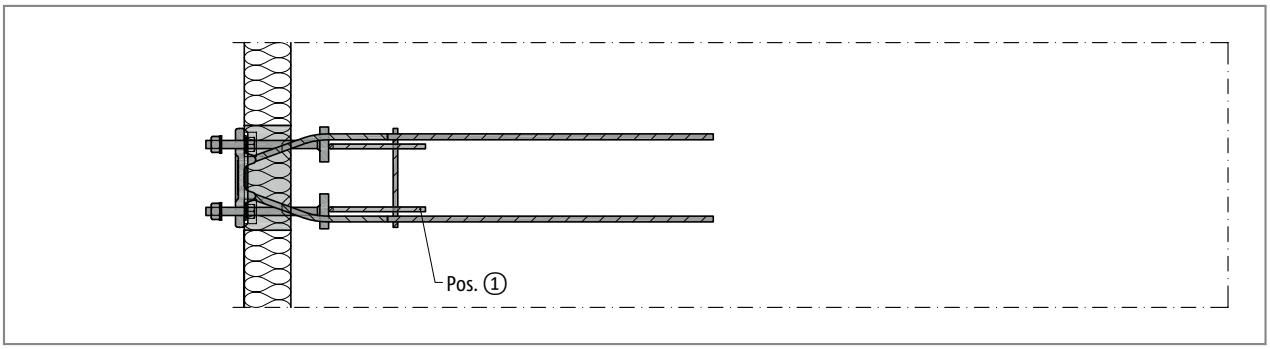


Fig. 72: Schöck Isokorb® T type SQ: On-site reinforcement: Plan view

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

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

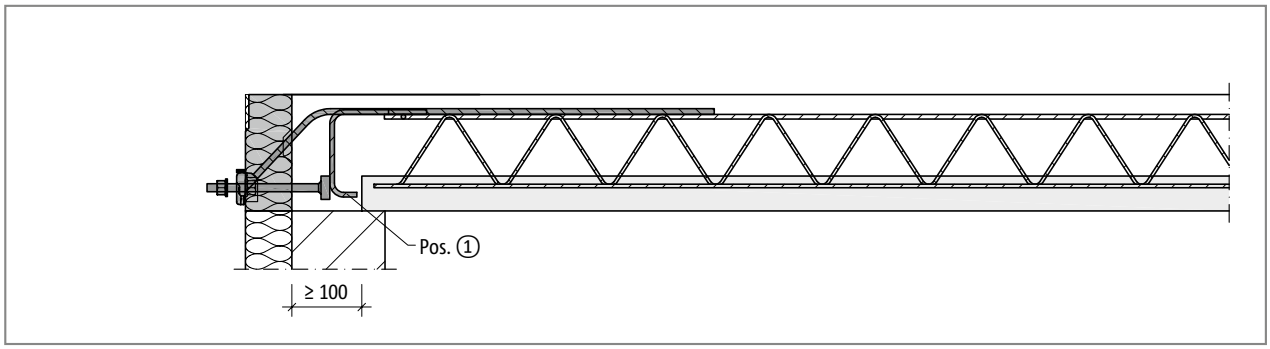


Fig. 73: Schöck Isokorb® T type SQ: On-site reinforcement for semi-precast construction: Cross section

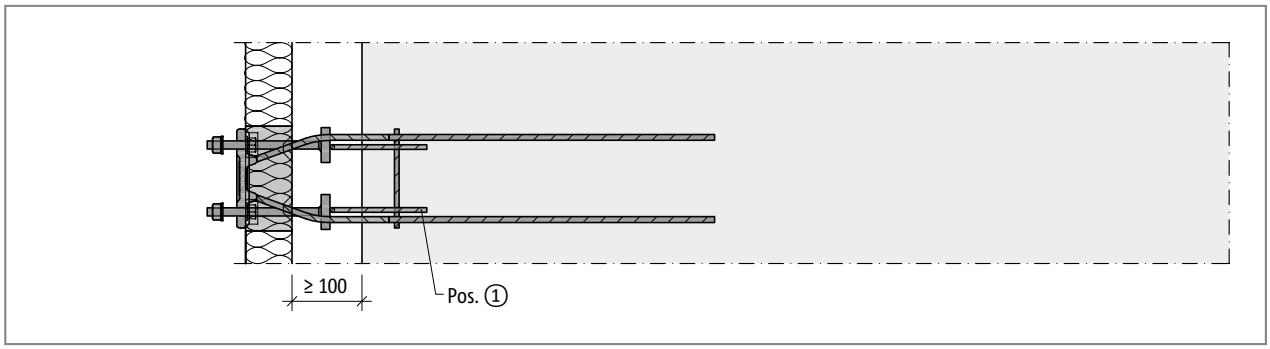


Fig. 74: Schöck Isokorb® T type SQ: On-site reinforcement for semi-precast construction: Plan view

Schöck Isokorb® T type SQ			V1 - V3
On-site reinforcement	Type of bearing	Height H [mm]	Floor slab (XC1) concrete grade ≥ C25/30 Balcony steel structure
Pos. 1 Edge and splitting tension reinforcement			
Pos. 1	direct/indirect	180 - 280	included with the product, alternative version with on-site stirrups 2 • H8

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 ⌀8 stirrups.

Fixing Plate

T Type SQ for transferring positive shear forces

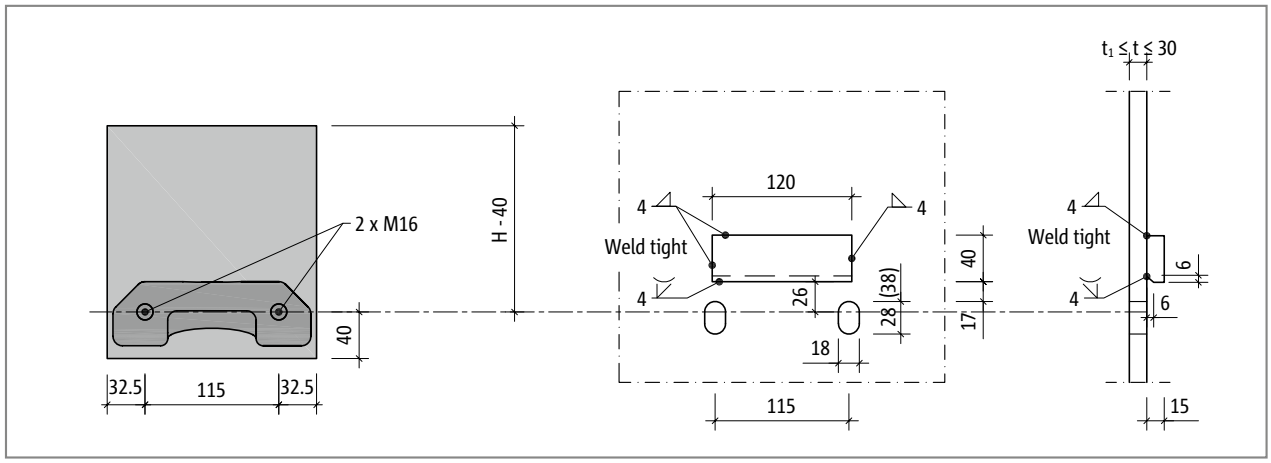


Fig. 75: Schöck Isokorb® T type SQ: Design of the fixing plate connection

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.

Fixing 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 $V_{Ed,y} > 0{,}342 \cdot \min. V_{Ed,z}$ parallel to the insulation joint occur, the front slab must be modified with ⌀18 mm round holes instead of slots to ensure load transfer.
- 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 ⌀ 16): 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®.

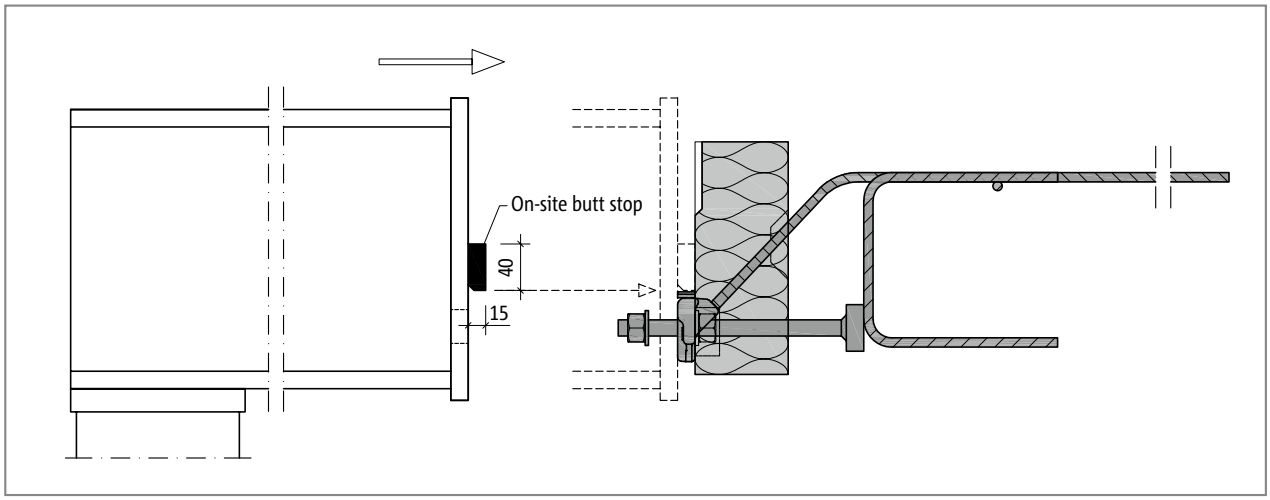


Fig. 76: Schöck Isokorb® T type SQ: Mounting the steel member

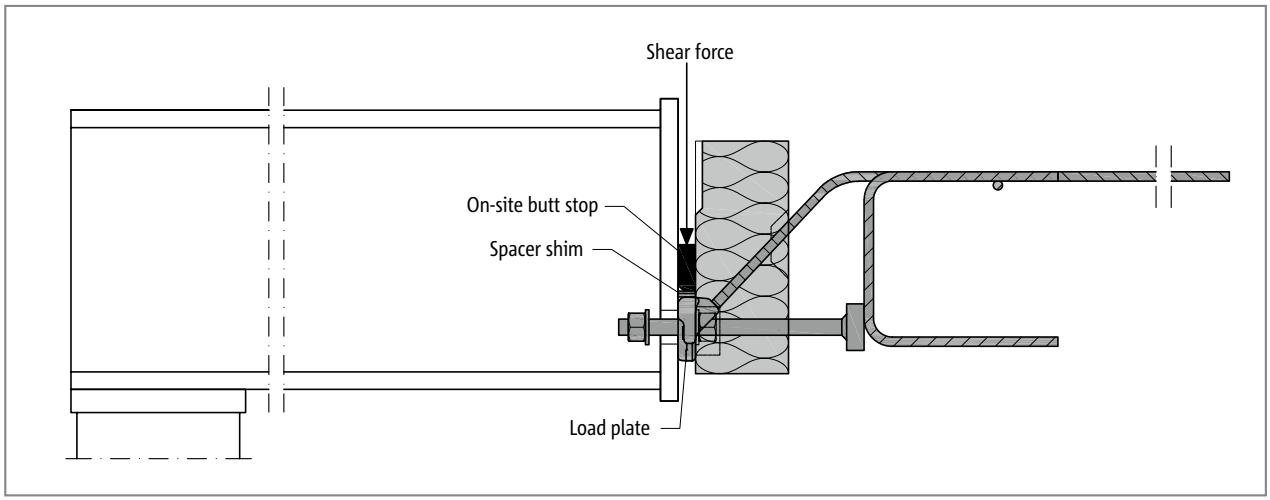


Fig. 77: Schöck Isokorb® T type SQ: On-site butt stop for transferring shear forces

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!

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

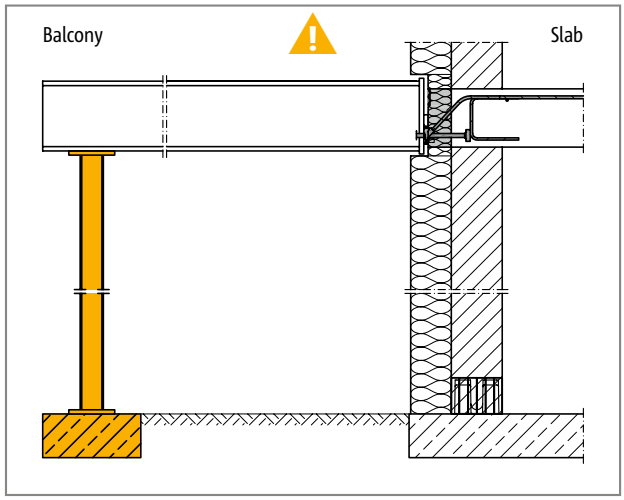


Fig. 78: Schöck Isokorb® T type SQ: Continuous support needed

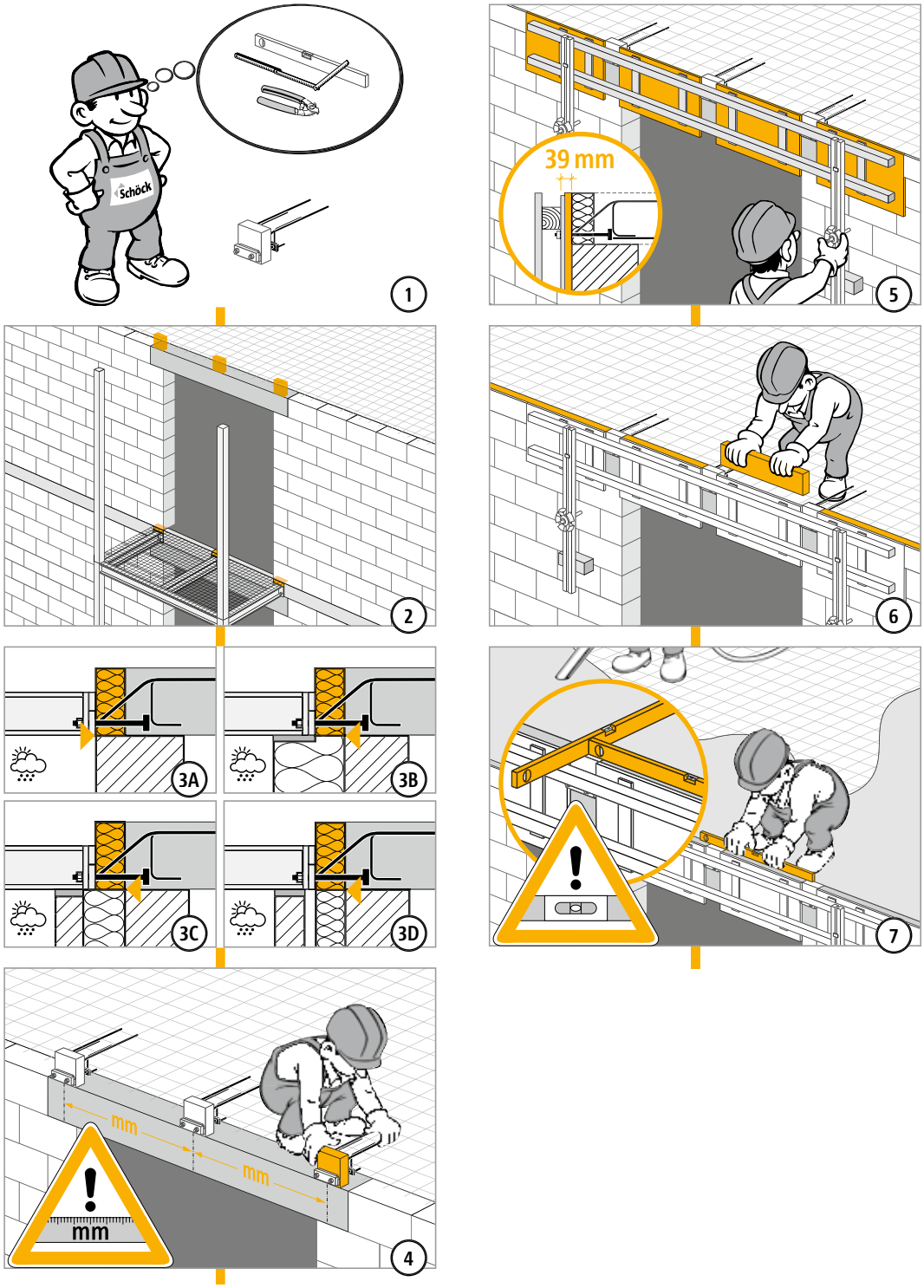
Supported balcony

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

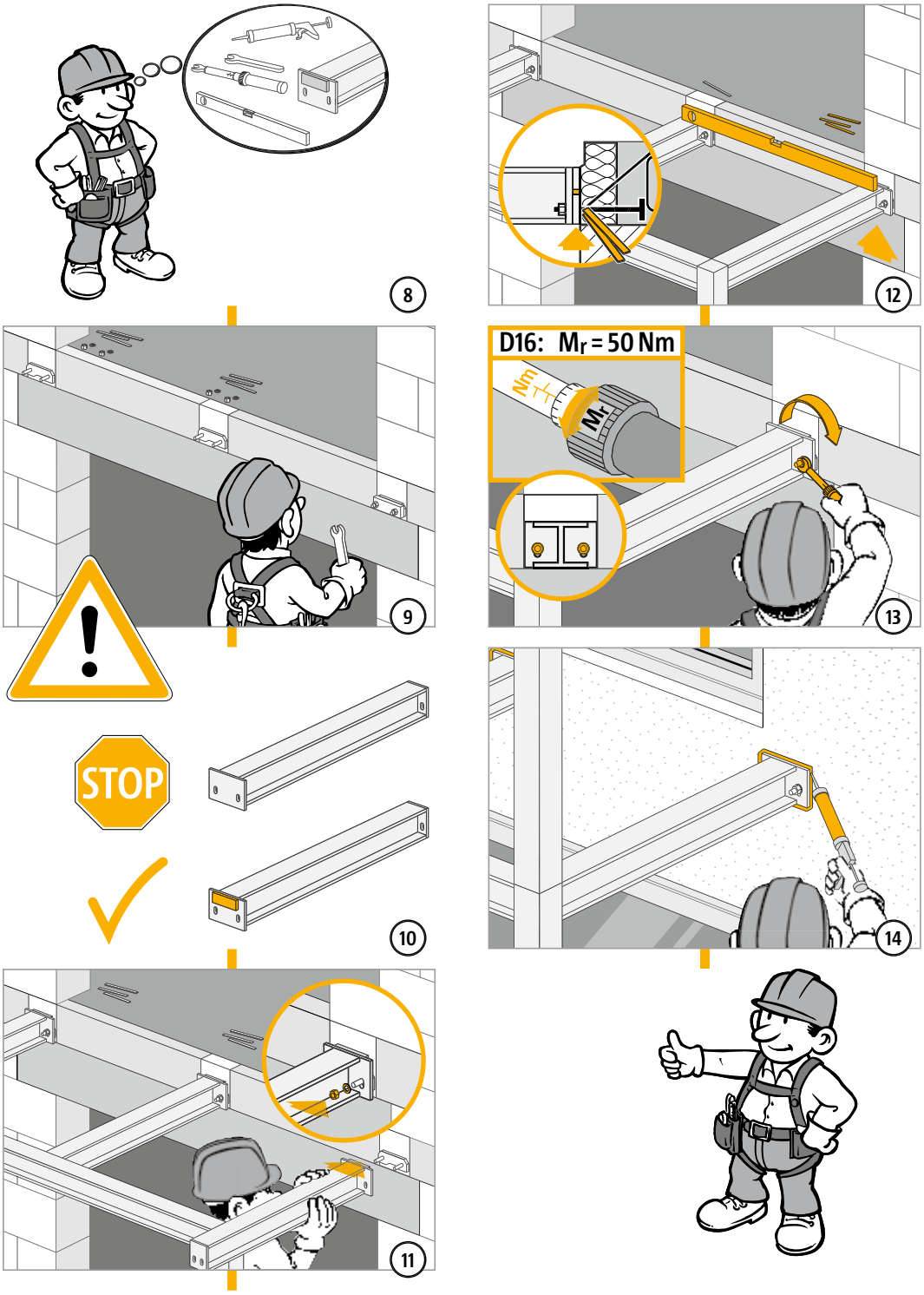
Hazard warning - missing supports

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

Method statement for concrete frame contractor



Method statement for steel constructor



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?
- ☐ 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 53) 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): Mr = 50 Nm