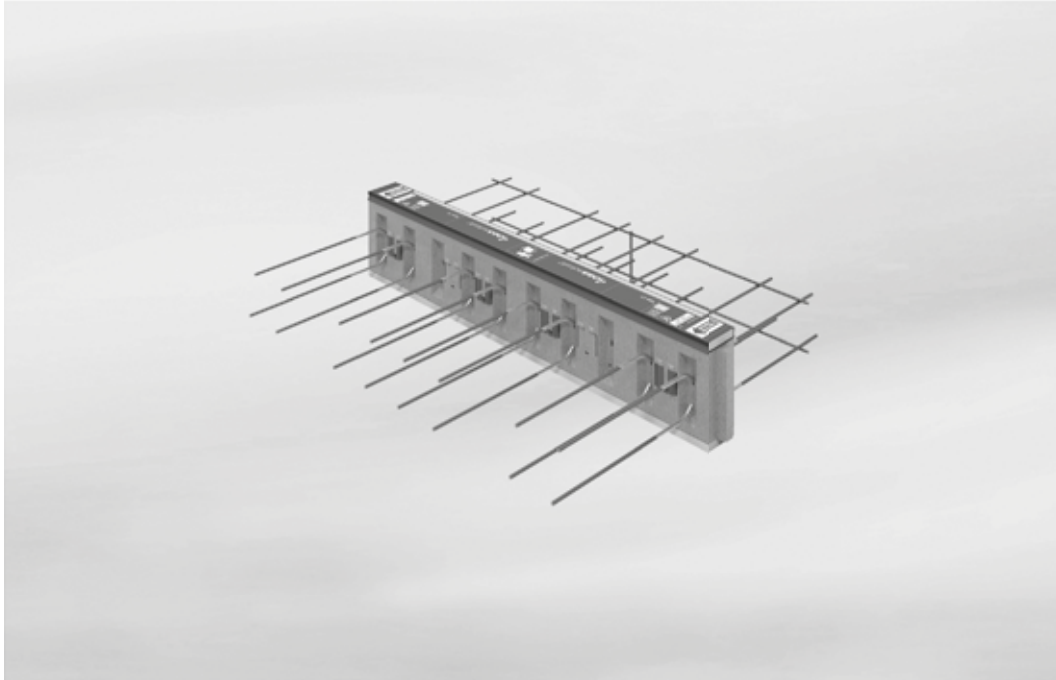


Schöck Isokorb® Type CV



The Schöck Isokorb® type CV is suitable for supported reinforced concrete slabs (C for concrete slab). It transmits positive and negative vertical shear force.

CV

Products

Assembly Section Details

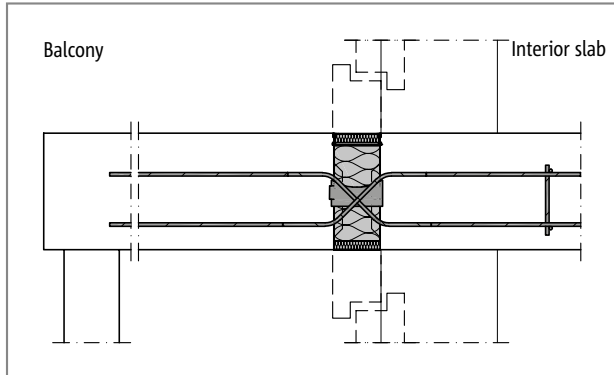


Fig. 1: Schöck Isokorb® Type CV: Supported balcony with window wall systems

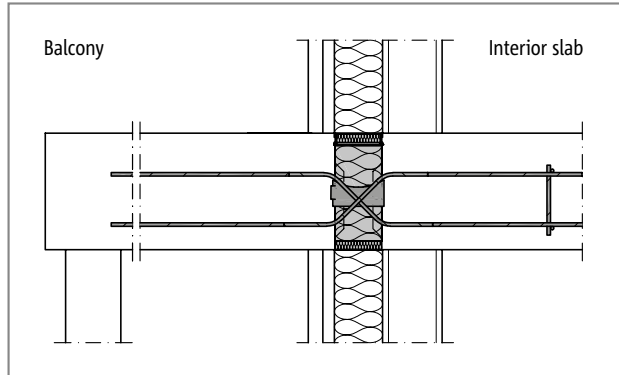


Fig. 2: Schöck Isokorb® Type CV: Supported balcony with steel stud wall, cavity insulation and facade cladding

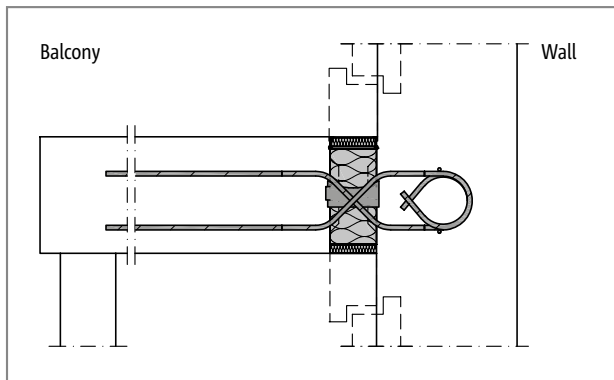


Fig. 3: Schöck Isokorb® Type CVW: Supported balcony with window wall systems

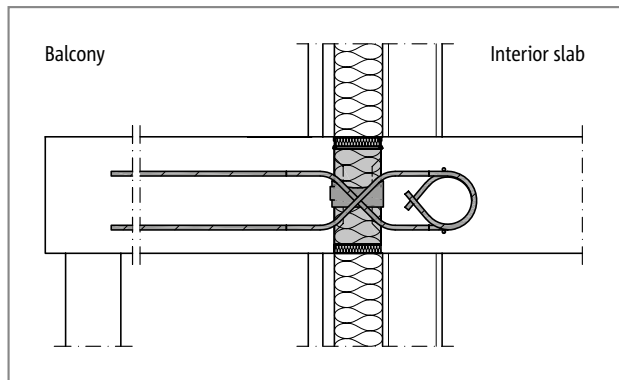


Fig. 4: Schöck Isokorb® Type CVW: Supported balcony with steel stud wall, cavity insulation and facade cladding

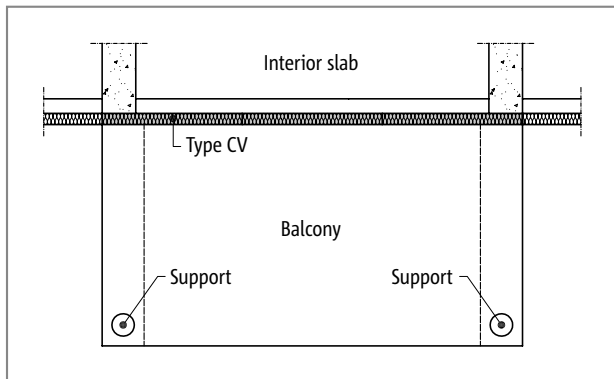


Fig. 5: Schöck Isokorb® Type CV: Supported balcony with only vertical loads

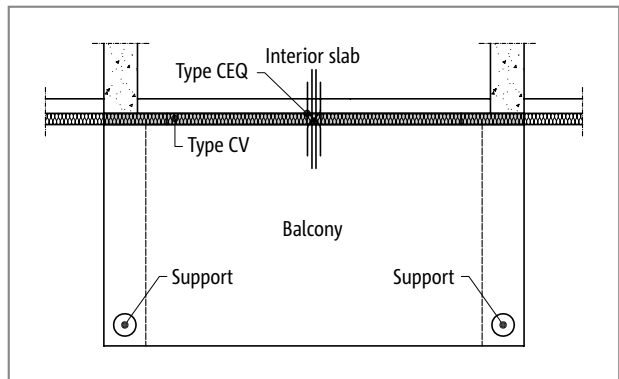


Fig. 6: Schöck Isokorb® Type CV: Supported balcony with vertical and horizontal load or earthquake load

Position of Schöck Isokorb®

For optimal thermal performance the Schöck Isokorb® should be aligned with the insulation layer.

Orientation of Schöck Isokorb®

- ▶ Attention: the Schöck Isokorb® does not have a symmetrical design in all cases.
- ▶ Ensure proper installation orientation as shown in the cross-section view on the design drawings.

i Note

- ▶ In the presence of horizontal loads, e.g. from earthquakes, Schöck Isokorb® module CEQ must be used.

Concrete Cover

Concrete cover (CC)

The concrete cover of the Schöck Isokorb® is set to 40 mm [1 9/16"] (CC40). This CC is set to cover the lower bars; the upper bars will generally have the same CC as a minimum, or greater depending on the slab height, as shown in the Product Dimensioning sections.

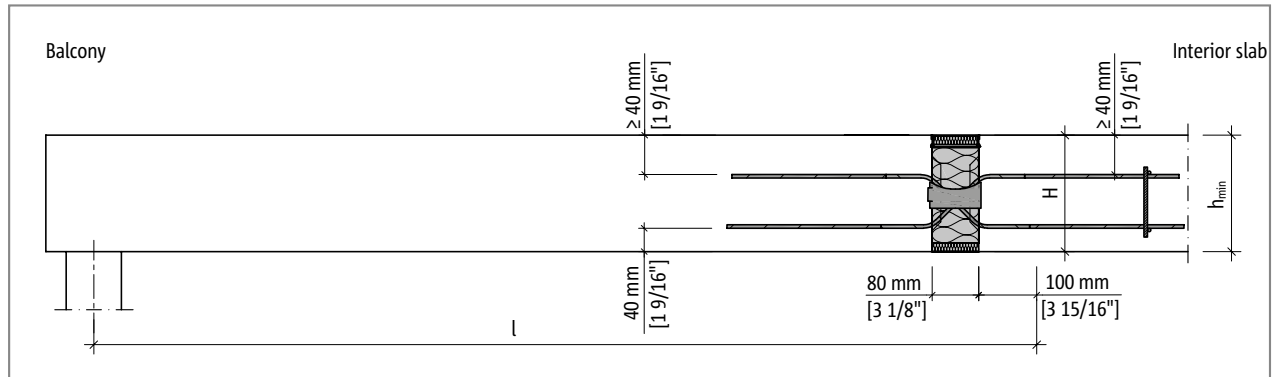


Fig. 7: Schöck Isokorb® Type CV: Concrete cover without sloping balcony slab

Minimum slab thickness

The following minimum slab thicknesses h_{\min} must be complied with depending on the load capacity.

Schöck Isokorb® Type	CV, CVW
Minimum slab height [mm]	180
Minimum slab height [in]	7"

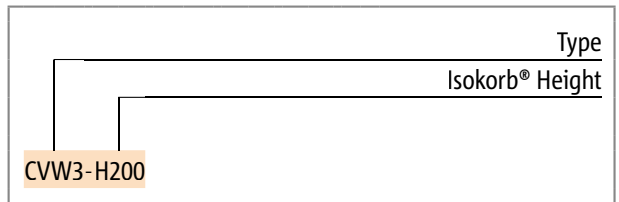
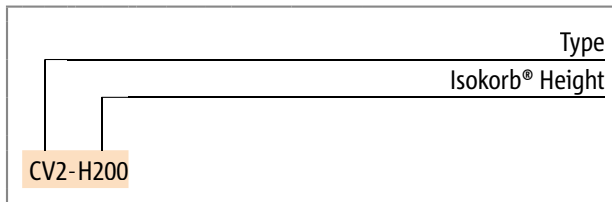
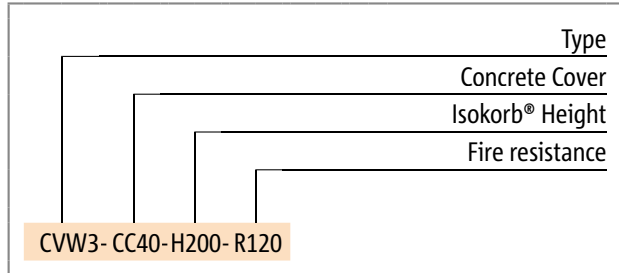
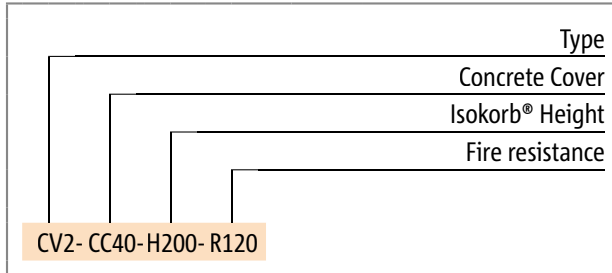
i Note

- ▶ Special designs are available for slab height $H = 160 - 170$ mm [6 1/4" - 6 3/4"] with CC30 - CC35 mm [1 1/8" - 1 3/8"].

Type Designation

Type designation

The following product naming system is used to specify the attributes of the Schöck Isokorb® product as required in the structural design. This naming system ensures that the product is manufactured in accordance with the required specification. There is also a short-form of each product name to facilitate recognition of the product on the construction site during installation. Every Schöck Isokorb® product comes with both its full production designation and short-form name printed on the label on each unit to ensure the product type is clearly represented. The design drawings will always show the full production name as well as the short-form installation name for cross referencing. Only the short-form product names are included on the installation drawings.



Expansion Joint Spacing

Expansion joints (recommended spacing)

Expansion joints are recommended to protect balcony slabs from temperature cracking when they are continuous for more than a critical length. The expansion joint spacing shown below corresponds to a temperature difference of $\Delta T = 70\text{ °C}$ [126 °F].

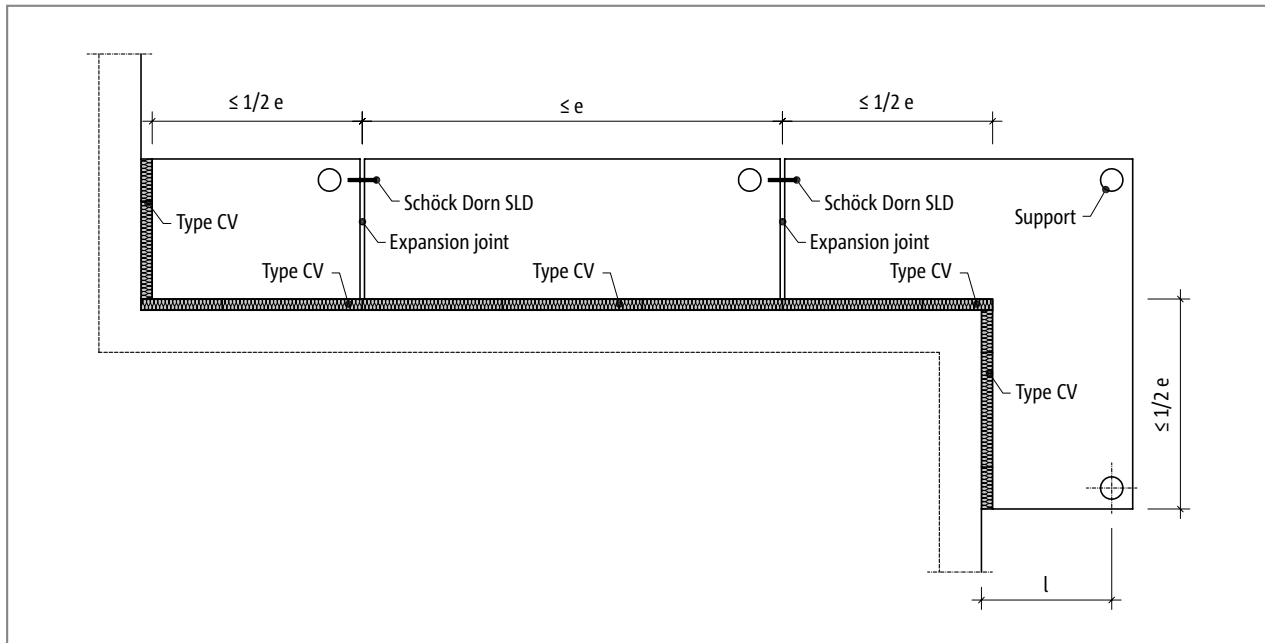


Fig. 8: Schöck Isokorb® Type CV: Maximum expansion joint spacing

Schöck Isokorb® Type		CV, CVW
Max expansion joint spacing		e [m]
Insulation Thickness [mm]	80	13.5

Schöck Isokorb® Type		CV, CVW
Max expansion joint spacing		e [ft in]
Insulation Thickness [in]	3 1/8"	44'-3 1/2"

CV

Products

Expansion Joint Spacing

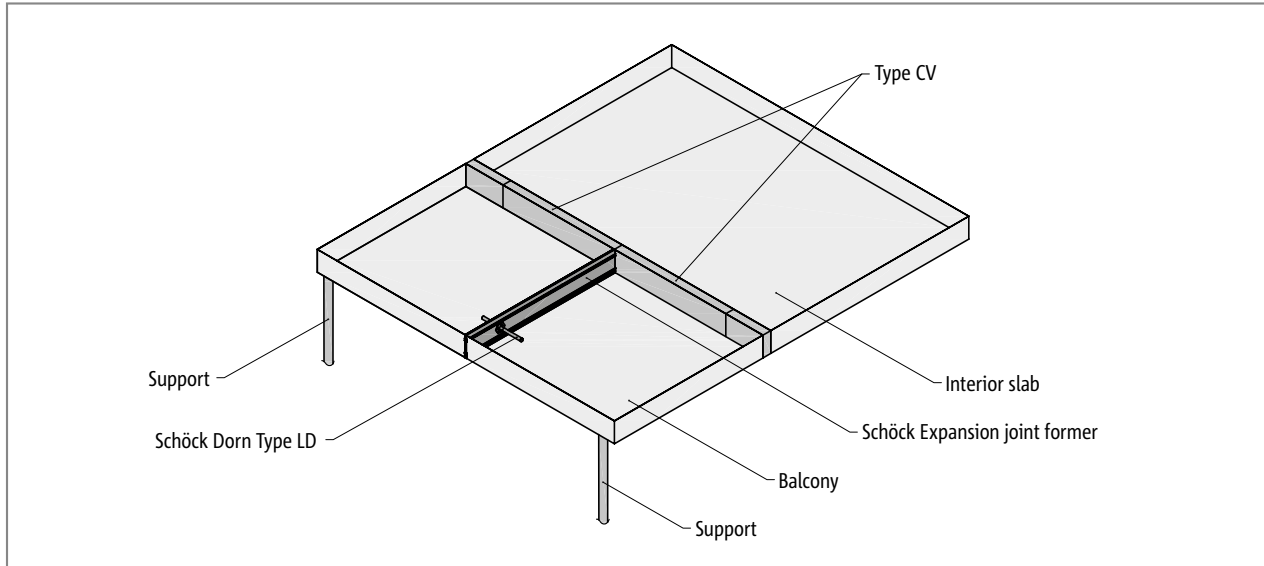


Fig. 9: Schöck Isokorb® Type CV: The expansion joint former

i Notes

- ▶ The maximum expansion joint spacing must be verified by the Engineer of Record (EOR).
- ▶ The joint must be free to contract or expand in the longitudinal direction. Schöck Dorn SLD in stainless steel A4 would be a suitable dowel connector for the expansion joint with the Schöck expansion joint former board.

Product Dimensioning

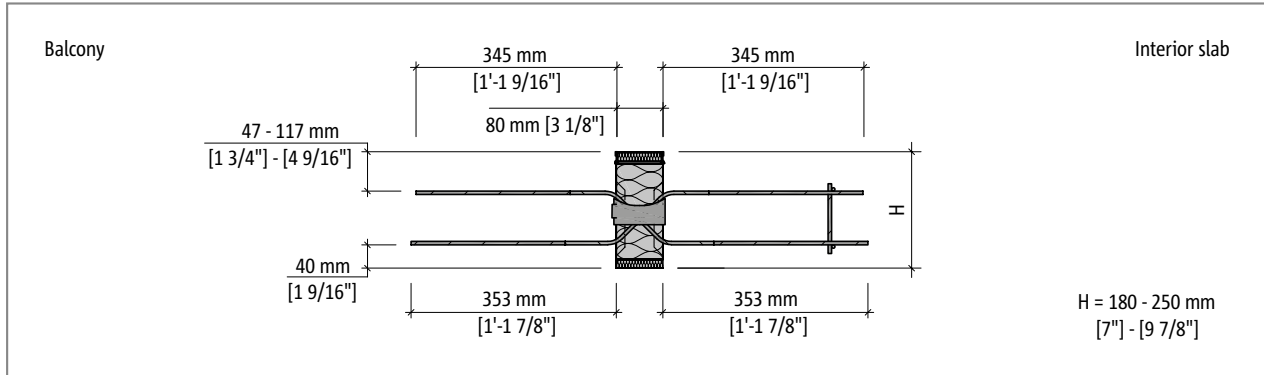


Fig. 10: Schöck Isokorb® Type CV10 and CV20: Product cross-section

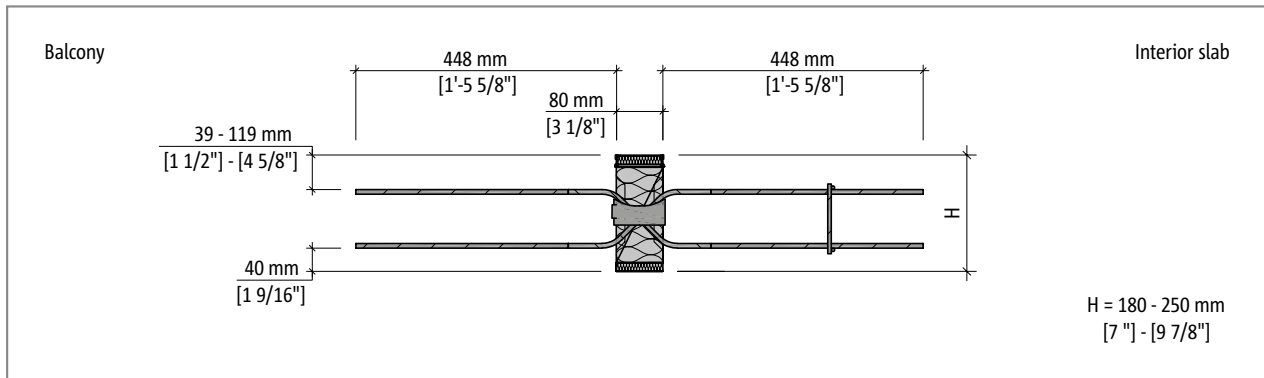


Fig. 11: Schöck Isokorb® Type CV30: Product cross-section

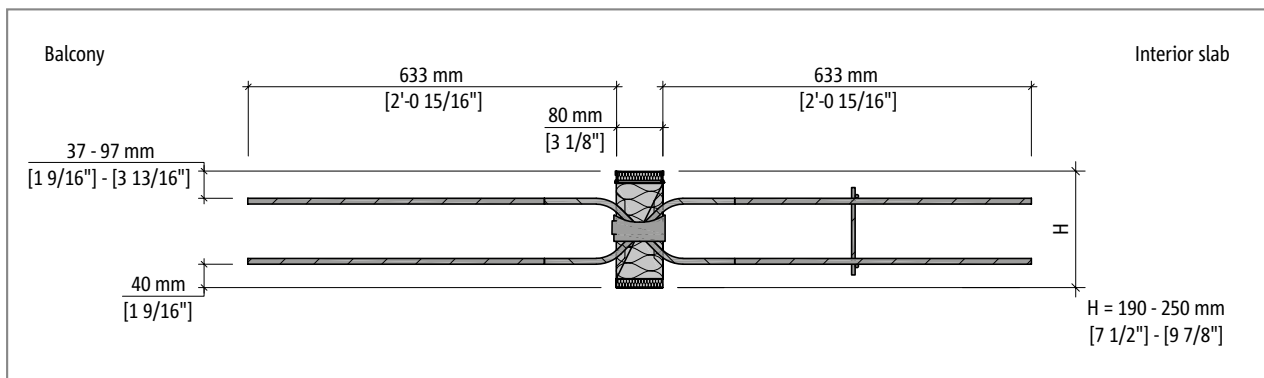


Fig. 12: Schöck Isokorb® Type CV40: Product cross-section

CV

Products

Product Dimensioning

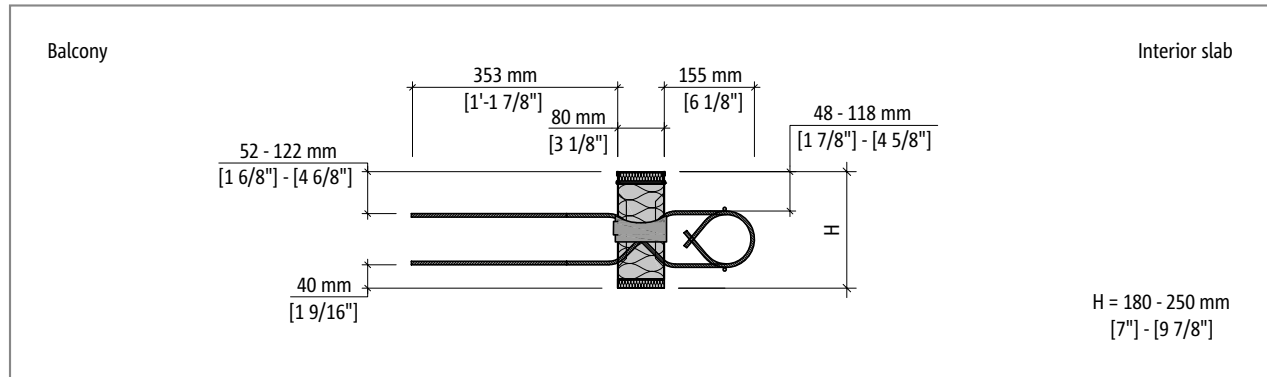


Fig. 13: Schöck Isokorb® Type CVW10: Product cross-section

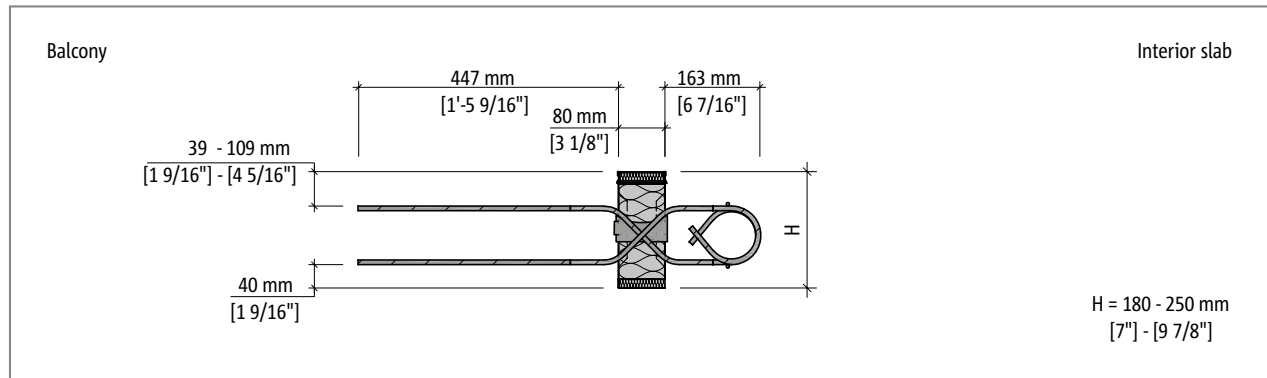


Fig. 14: Schöck Isokorb® Type CVW30: Product cross-section

Schöck Isokorb® Type	CV10, CVW10	CV20	CV30, CVW30	CV40
Isokorb®-Length [mm]	1000	1000	1000	1000
Isokorb®-Length [ft in]	3'-3 3/8"	3'-3 3/8"	3'-3 3/8"	3'-3 3/8"
Shear Resistance Bars	6 \varnothing 6 + 6 \varnothing 6	8 \varnothing 6 + 8 \varnothing 6	6 \varnothing 8 + 6 \varnothing 8	6 \varnothing 10 + 6 \varnothing 10
Concrete compression bearing modules	4	4	4	4

i Notes

- ▶ The product cross-sections of load capacities CV10 and CV20 of the Schöck Isokorb® Type CV are identical.
- ▶ The Schöck Isokorb® may be cut at locations of free insulation where no structural components conflict with the line of cut. The pressure bearing modules require at least 50 mm [2"] of concrete cover; ensure adequate spacing from the edge of the concrete slab. The spacing of the shear force bars along the length of the Schöck Isokorb® must be at least 100 mm [4"] and no more than 150 mm [6"].
- ▶ The shear force bar lengths vary as shown in the following plan details.
- ▶ The Schöck Isokorb® consists of metric components.
- ▶ Reinforcement bars \varnothing 6 correspond to 1/4" diameter
- ▶ Reinforcement bars \varnothing 8 correspond to 5/16" diameter
- ▶ Reinforcement bars \varnothing 10 correspond to 3/8" diameter

Product Dimensioning

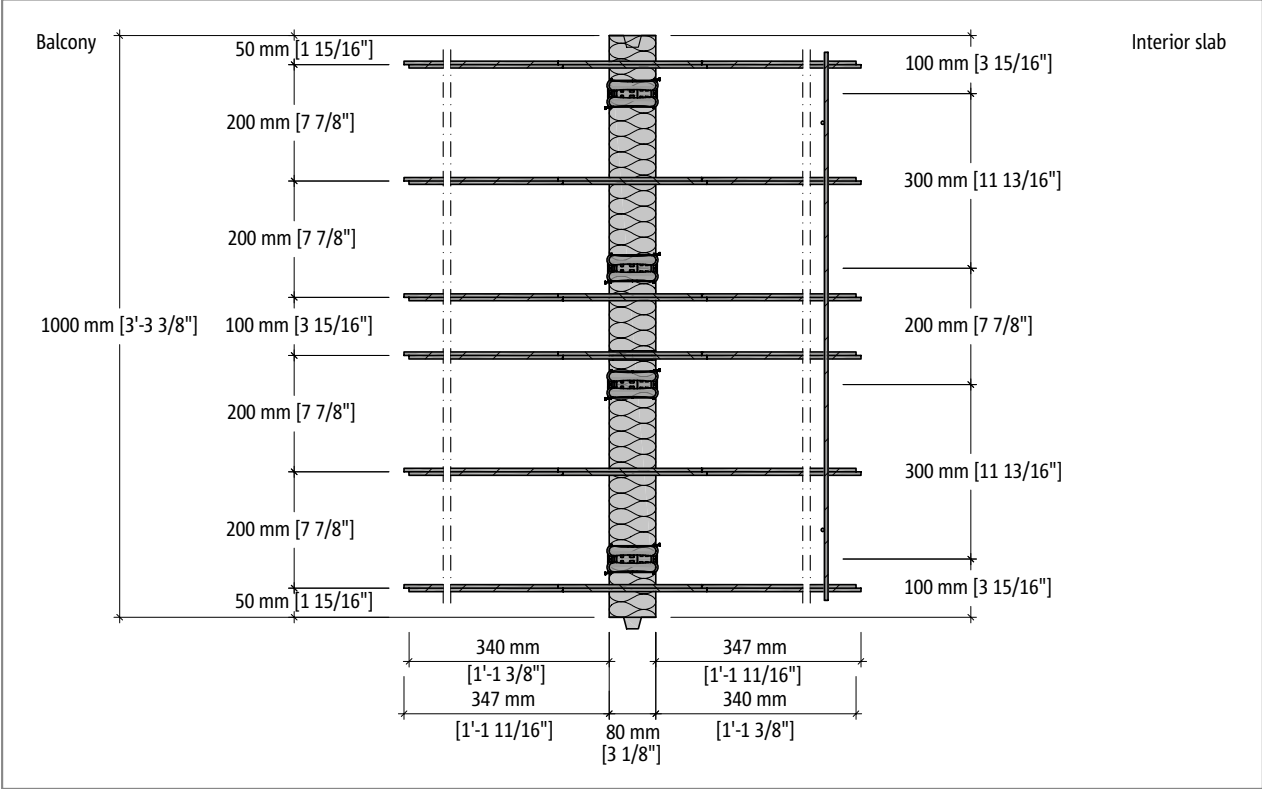


Fig. 15: Schöck Isokorb® Type CV10: Overhead view of the product

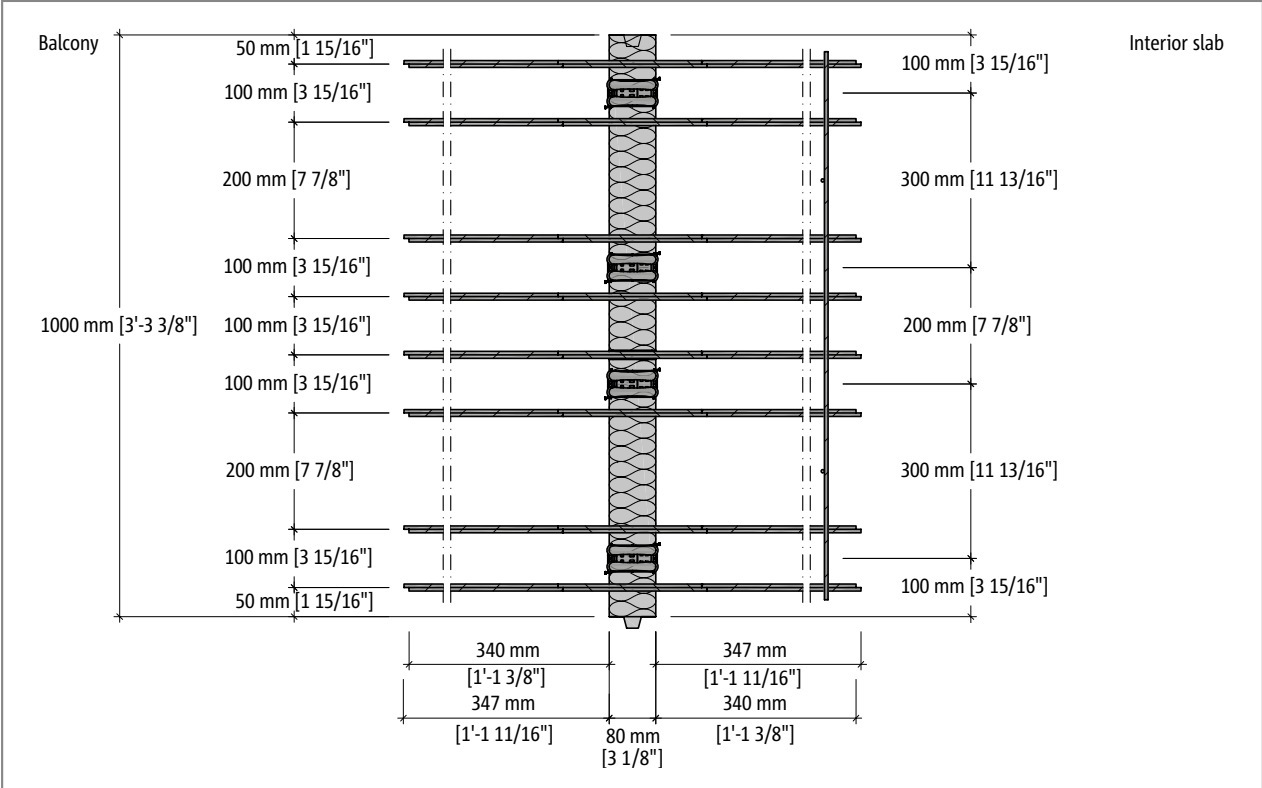


Fig. 16: Schöck Isokorb® Type CV20: Overhead view of the product

CV
Products

Product Dimensioning

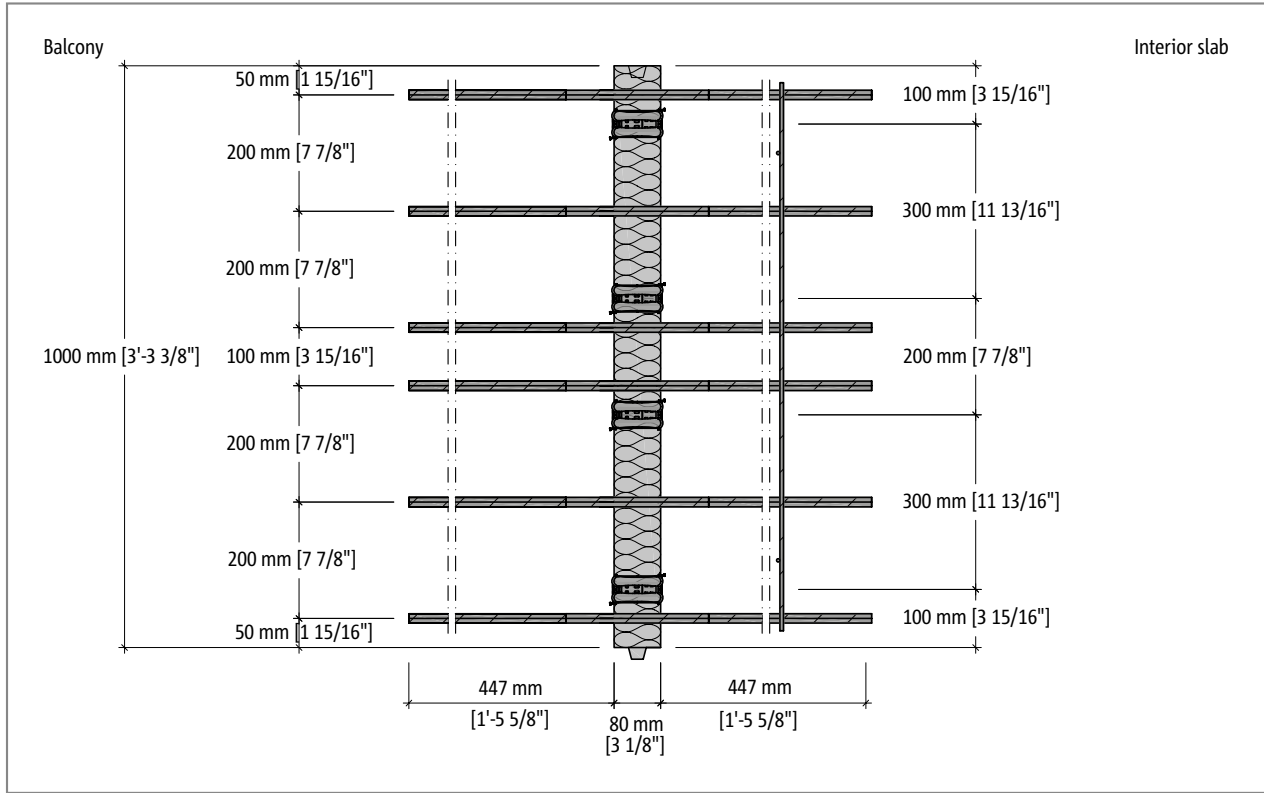


Fig. 17: Schöck Isokorb® Type CV30: Overhead view of the product

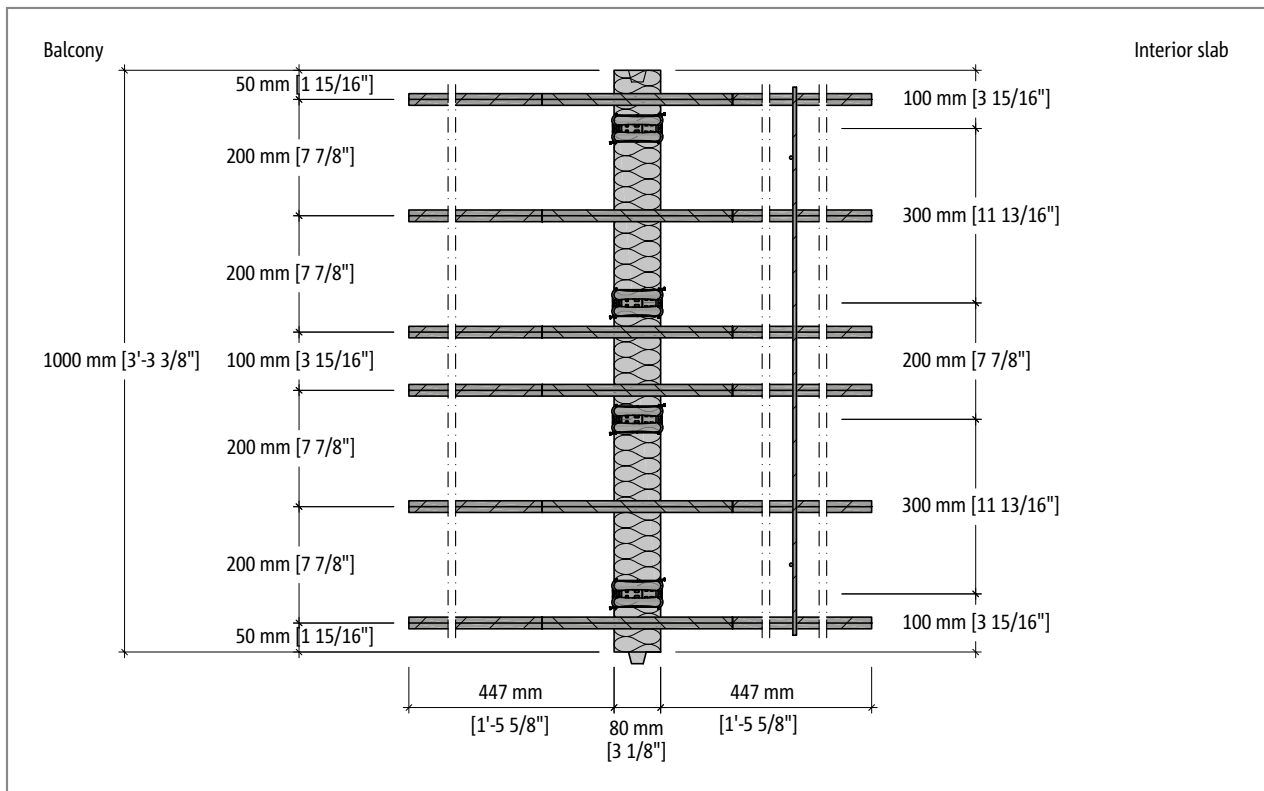


Fig. 18: Schöck Isokorb® Type CV40: Overhead view of the product

Product Dimensioning

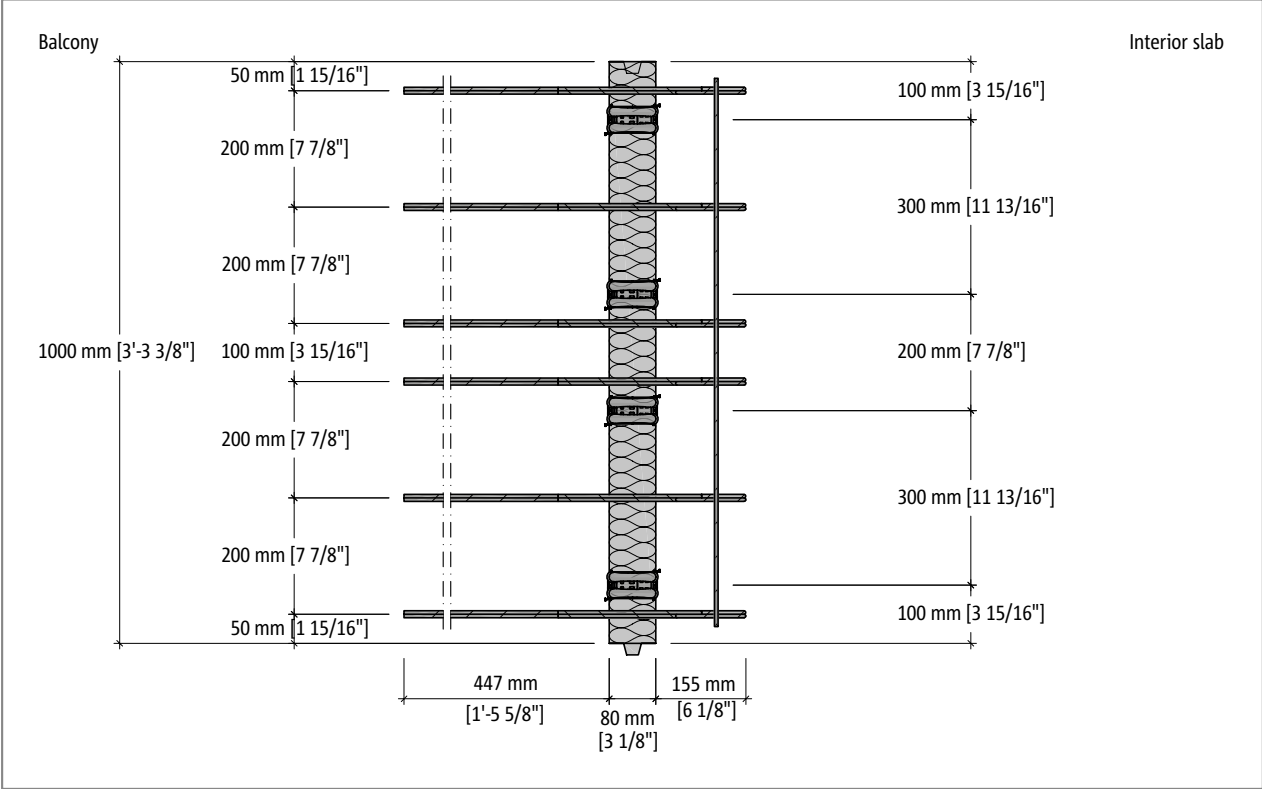


Fig. 19: Schöck Isokorb® Type CVW10: Overhead view of the product

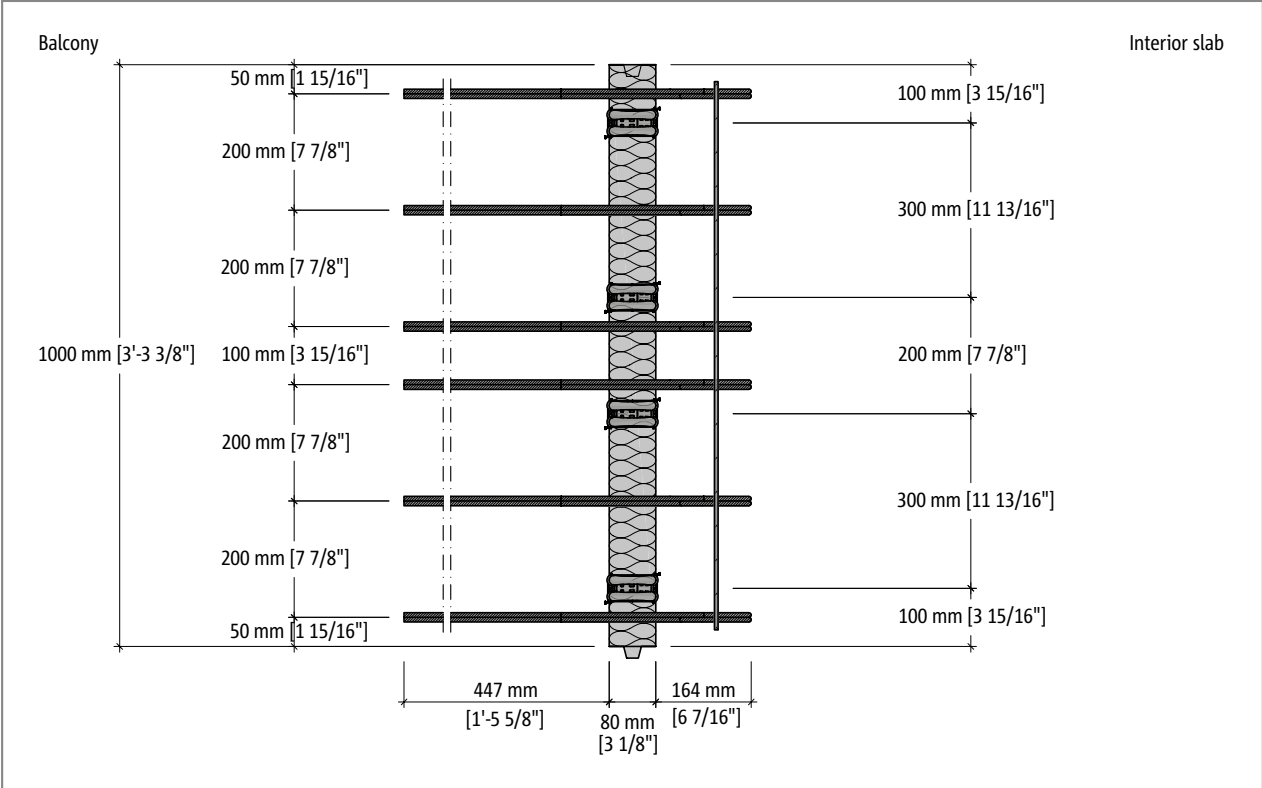


Fig. 20: Schöck Isokorb® Type CVW30: Overhead view of the product

Strength Capacity

Product selection table as per ACI 318-14

Schöck Isokorb® Type	CV10, CVW10	CV20	CV30, CVW30	CV40
Design Values with	ϕV_n [kN/m]			
Concrete Strength $\geq 27,5$ MPa	± 44.7	± 59.6	± 79.4	± 110.8

Product selection table as per ACI 318-14

Schöck Isokorb® Type	CV10, CVW10	CV20	CV30, CVW30	CV40
Design Values with	ϕV_n [kips/ft]			
Concrete Strength ≥ 4.000 psi	± 3.1	± 4.1	± 5.4	± 7.6

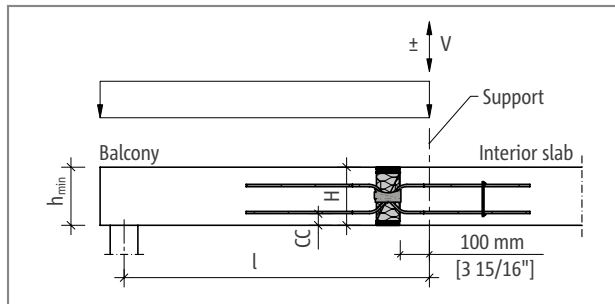


Fig. 21: Schöck Isokorb® Type CV: Structural system

Notes

- ▶ If any concrete on the interior or exterior of the Schöck Isokorb® is less than 27.5 MPa [4,000 psi] contact Schöck Design Department.
- ▶ The shear capacity of the slabs must be verified by the Engineer of Record (EOR).
- ▶ Because of the eccentric connection, a moment occurs at the slab edges at both sides of the Schöck Isokorb® as shown on the following page. The transmission of this moment in the two connecting slabs must be verified in each individual case.
- ▶ Verification for the slabs attached at both sides of the Schöck Isokorb® must be submitted by the Engineer of Record (EOR). When the reinforcement of the floor slab and the balcony slab which connect to the Schöck Isokorb® Type CV is being determined, it must be assumed that there is a hinge, since the Schöck Isokorb® Type CV can only transmit shear force.
- ▶ For seismic loads Schöck Isokorb® has to be combined with the Schöck Isokorb® Type CEQ.
- ▶ The Schöck Isokorb® capacities consider a maximum permitted bar separation according to ACI 318-14, based on the same height of the slab and Isokorb® and a concrete cover of the interior slab of 20 mm [3/4"]. For differing boundary conditions the capacities have to be checked.
- ▶ The values shown in the design capacity tables are ultimate (factored) values.
- ▶ The support is assumed to be 100 mm [4"] from the Schöck Isokorb® insulation body on the interior slab side.
- ▶ For SI: 1 inch = 25.4 mm, 1 lbf = 4.448 N, 1 psi = 0.006897 MPa. For pound-inch units: 1 mm = 0.03937 inches, 1 N = 0.2248 lbf, 1 MPa = 145.0 psi.

Deformation | Moments from eccentric connection

Deformation

An estimate of the additional deformation from the Schöck Isokorb® was made on the basis of component testing. In the tests, the bearing points or bearing edges were subjected to vertical deformation of approx. 0.8 to 1.0 mm [1/32" to 5/128"].

Moments from eccentric connection

In order to determine the connecting reinforcement at both sides of the Schöck Isokorb®, moments from an eccentric connection must also be taken into consideration. Each of these moments must be overlaid with the moments from the planned load, providing that they act in the same direction.

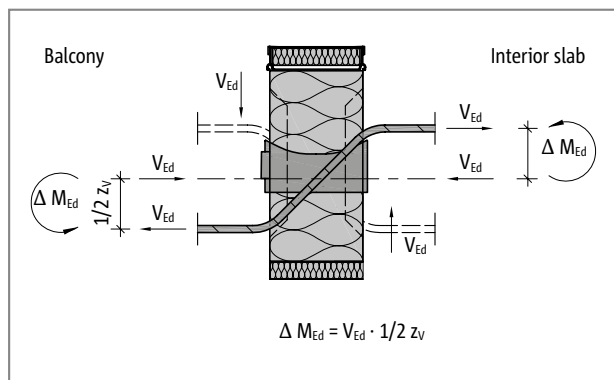


Fig. 22: Schöck Isokorb® Typ CV: Moments from eccentric connection

Schöck Isokorb® Type	CV10, CVW10	CV20	CV30, CVW30	CV40
Design Values with	$\Delta M_{ecc,f}$ [kNm/m]			
Concrete Strength $\geq 27,5$ MPa	1.9	2.6	3.7	5.7

Schöck Isokorb® Type	CV10, CVW10	CV20	CV30, CVW30	CV40
Design Values with	$\Delta M_{ecc,f}$ [kip-ft/ft]			
Concrete Strength ≥ 4.000 psi	0.4	0.6	0.8	1.3

i Note

- ▶ These recommendations should be checked by the Engineer of Record (EOR) and modified if necessary.

On Site Reinforcement

The cast-in-place reinforcement is defined by the Engineer of Record (EOR) of the building in accordance with structural requirements. The shear force bars of the Schöck Isokorb® Type CV must be overlapped with the tensile reinforcement (Position 1). Positions 2 (longitudinal edge reinforcement), Position 3 (U-Bars) and Position 4 (U-Bars for the free balcony edge) must also be provided. The following is a suggestion for the reinforcement layout.

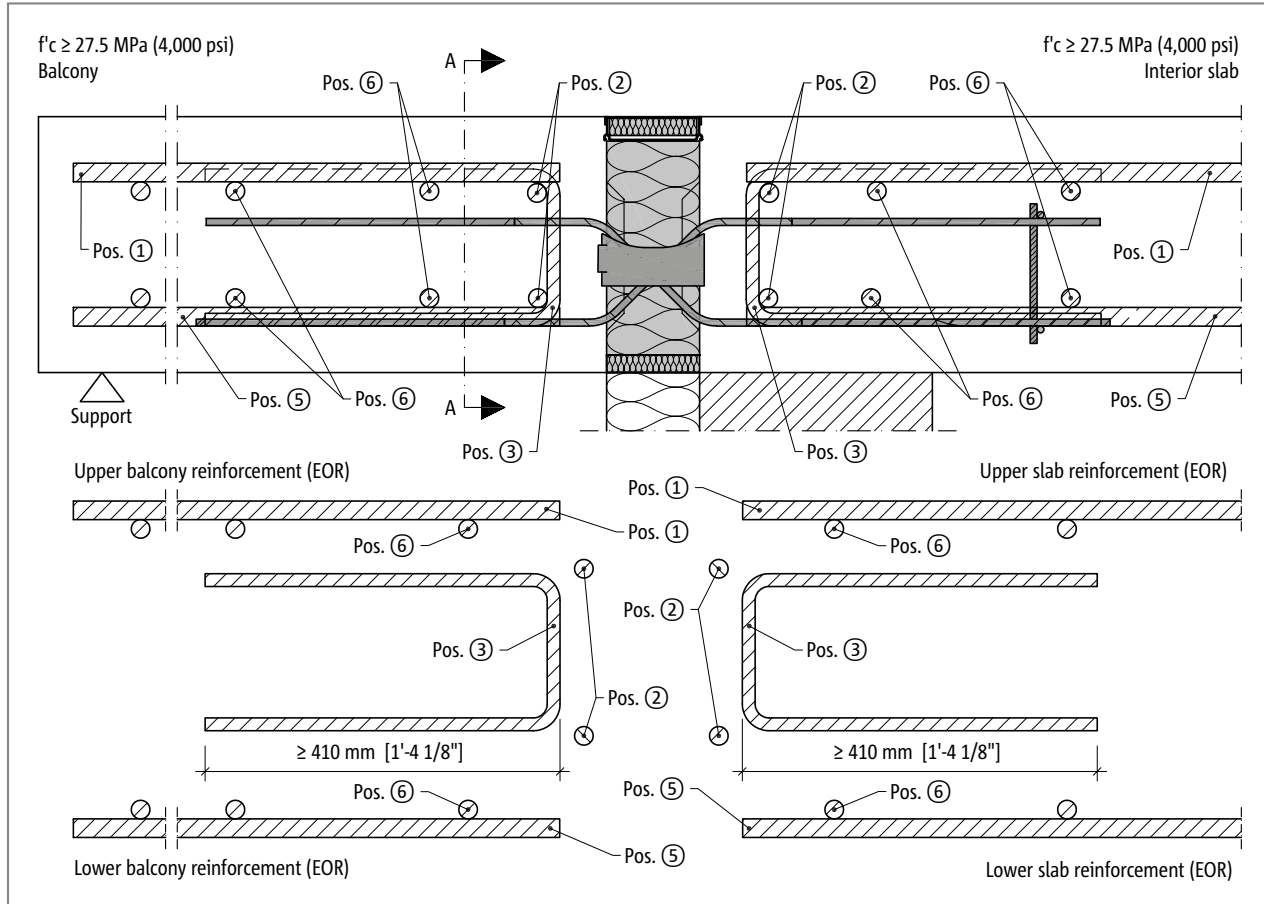


Fig. 23: Schöck Isokorb® Type CV: Cross section of recommended cast-in-place reinforcement (supplied by others)

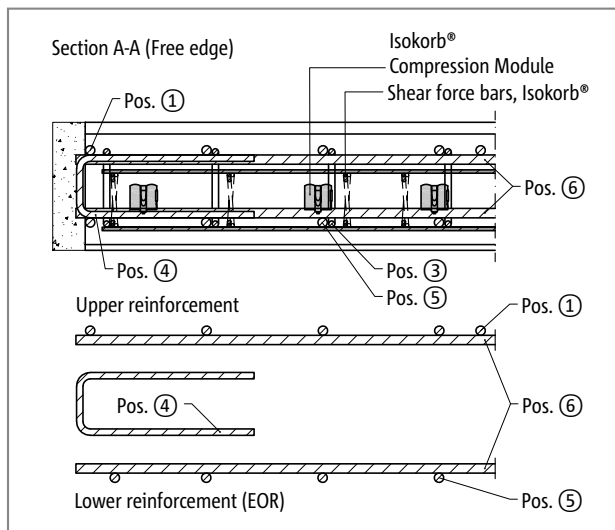


Fig. 24: Schöck Isokorb® Type CV: Section A-A Depiction of free balcony edge

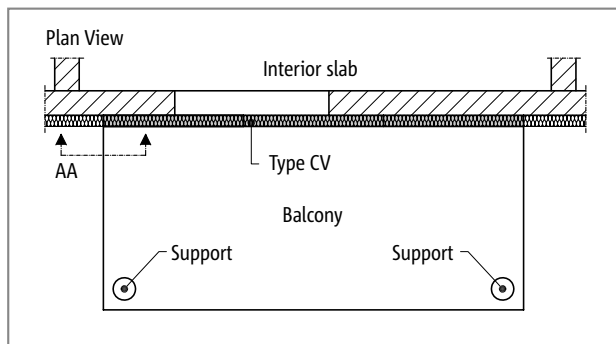


Fig. 25: Schöck Isokorb® Type CV: Location of Section A-A

On Site Reinforcement

At the table below are suggestions for cast-in-place connective reinforcement for 100 % section strength with minimum concrete strength of 27.5 MPa [4,000 psi]. The existing slab reinforcement can be taken into account for the required reinforcement of connections with Schöck Isokorb®.

Schöck Isokorb® Type	CV10	CV20	CV30	CV40
On Site Reinforcement	Concrete Strength \geq 27,5 MPa (4.000 psi)			
Pos. 1 Slab Reinforcement				
Pos. 1 [mm ² /m] / [in ² /ft]	In accordance with EOR specifications			
Pos. 2 Longitudinal Bars Parallel to Insulation				
Pos. 2 Variant	4 × #3			
Pos. 3 Constructive edge reinforcement at Isokorb joint				
Pos. 3 Variant A	#3 @ 250 mm [#3 @ 10"]	#3 @ 250 mm [#3 @ 10"]	#3 @ 250 mm [#3 @ 10"]	#3 @ 250 mm [#3 @ 10"]
Pos. 3 Variant B	#5 @ 350 mm [#5 @ 14"]	#5 @ 350 mm [#5 @ 14"]	#5 @ 350 mm [#5 @ 14"]	#5 @ 350 mm [#5 @ 14"]
Pos. 4 Constructive edge reinforcement at free slab edges				
Pos. 4 [mm ² /m] / [in ² /ft]	In accordance with EOR specifications			
Pos. 5 Bottom layer reinforcement				
Pos. 5 [mm ² /m] / [in ² /ft]	In accordance with EOR specifications			
Pos. 6 Longitudinal reinforcement				
Pos. 6 [mm ² /m] / [in ² /ft]	In accordance with EOR specifications			

i Notes

- ▶ Pos. 4 should be chosen such that the U-bars can be arranged between the legs of Pos. 3.
- ▶ The upper and lower reinforcement of the connecting slabs must run as close as possible to the thermal insulation layer at both sides of the Schöck Isokorb®, taking the required concrete cover into consideration.
- ▶ All free edges must be stiffened using structural U-bars as per Engineer of Record (EOR) specifications.
- ▶ The centerline distance of any pressure element from any free concrete edge, including expansion joints, must be at least 50 mm [2"].
- ▶ The centerline distance of any tension or shear bar from any free concrete edge, including expansion joints, must be at least 50 mm [2"].
- ▶ The shear force reinforcement must be spliced to the tensile reinforcement in the slab to be connected. In cases in which shear force bars and pressure elements are not laid in the same layer, the anchoring length of the shear force bars must also be determined in the compression zone, as it does for the tension bars.
- ▶ The lap splice length provided by Schöck Isokorb® = the length of the tension bar from the face of Schöck Isokorb® to the free end - concrete cover (CC).
- ▶ The usage of Schöck Isokorb® in balconies assumes stiff slab edges to ensure only shear forces affecting the connection and no field moment. The formation of stiff slab edges must be specified by EOR.

On Site Reinforcement

The cast-in-place reinforcement is defined by the Engineer of Record (EOR) of the building in accordance with structural requirements. The shear force bars of the Schöck Isokorb® Type CV must be overlapped with the tensile reinforcement (Position 1). Positions 2 (longitudinal edge reinforcement), Position 3 (U-Bars) and Position 4 (U-Bars for the free balcony edge) must also be provided. The following is a suggestion for the reinforcement layout.

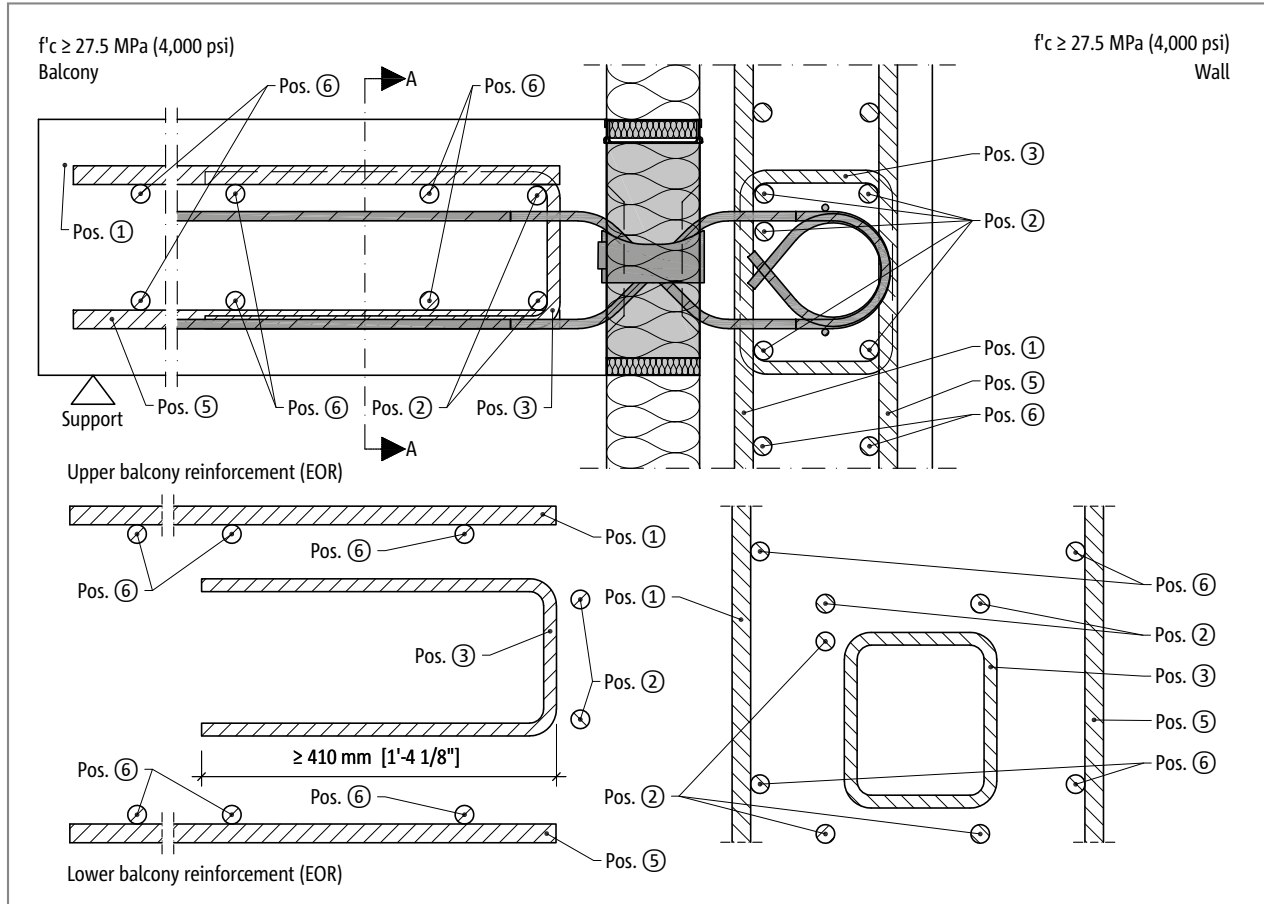


Fig. 26: Schöck Isokorb® Type CVW: Cross section of recommended cast-in-place reinforcement (supplied by others)

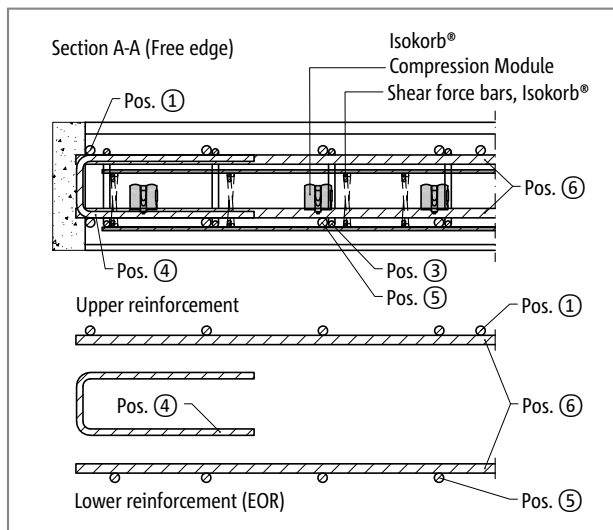


Fig. 27: Schöck Isokorb® Type CV: Section A-A Depiction of free balcony edge

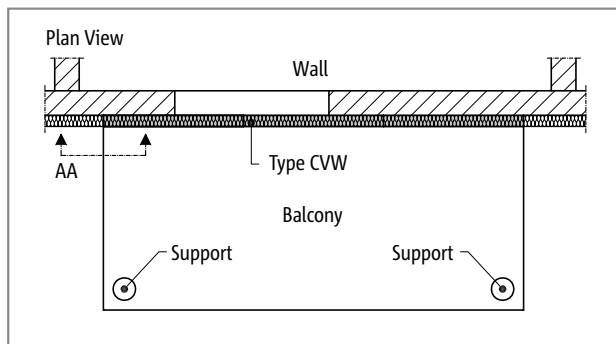


Fig. 28: Schöck Isokorb® Type CVW: Location of Section A-A

On Site Reinforcement

At the table below are suggestions for cast-in-place connective reinforcement for 100 % section strength with minimum concrete strength of 27.5 MPa [4,000 psi]. The existing wall reinforcement can be taken into account for the required reinforcement of connections with Schöck Isokorb®.

Schöck Isokorb® Type	CVW10	CVW30
On Site Reinforcement	Concrete Strength $\geq 27,5$ MPa (4.000 psi)	
Pos. 1 Overlapping reinforcement in the wall		
Pos. 1 [mm ² /m] / [in ² /ft]	In accordance with EOR specifications	
Pos. 2 Longitudinal Bars Parallel to Insulation		
Pos. 2 Variant - balcony side	2 × #3	
Pos. 2 Variant - interior slab side	5 × #3	
Pos. 3 Constructive edge reinforcement at Isokorb joint		
Pos. 3 Variant A	#3 @ 250 mm [#3 @ 10"]	#3 @ 250 mm [#3 @ 10"]
Pos. 3 Variant B	#5 @ 350 mm [#5 @ 14"]	#5 @ 350 mm [#5 @ 14"]
Pos. 4 Constructive edge reinforcement at free slab edges		
Pos. 4 [mm ² /m] / [in ² /ft]	In accordance with EOR specifications	
Pos. 5 Bottom layer reinforcement		
Pos. 5 [mm ² /m] / [in ² /ft]	In accordance with EOR specifications	
Pos. 6 Longitudinal reinforcement		
Pos. 6 [mm ² /m] / [in ² /ft]	In accordance with EOR specifications	

i Notes

- ▶ Pos. 4 should be chosen such that the U-bars can be arranged between the legs of Pos. 3.
- ▶ The upper and lower reinforcement of the connecting slabs must run as close as possible to the thermal insulation layer at both sides of the Schöck Isokorb®, taking the required concrete cover into consideration.
- ▶ All free edges must be stiffened using structural U-bars as per Engineer of Record (EOR) specifications.
- ▶ The centerline distance of any pressure element from any free concrete edge, including expansion joints, must be at least 50 mm [2"].
- ▶ The centerline distance of any tension or shear bar from any free concrete edge, including expansion joints, must be at least 50 mm [2"].
- ▶ The shear force reinforcement must be spliced to the tensile reinforcement in the slab to be connected. In cases in which shear force bars and pressure elements are not laid in the same layer, the anchoring length of the shear force bars must also be determined in the compression zone, as it does for the tension bars.
- ▶ The lap splice length provided by Schöck Isokorb® = the length of the tension bar from the face of Schöck Isokorb® to the free end - concrete cover (CC).
- ▶ The usage of Schöck Isokorb® in balconies assumes stiff slab edges to ensure only shear forces affecting the connection and no field moment. The formation of stiff slab edges must be specified by EOR.

✓ Check List

- Has the Schöck Isokorb® type that is suitable for the structural system been chosen? Type CV is considered to be a shear force connection only (hinge joint).
- Has the system length “l” been used for the design?
- Have the factored forces at the Schöck Isokorb® connection been determined at design level?
- Do the member forces at the Schöck Isokorb® connection include the effects of eccentricity of the connection?
- Has the critical concrete strength been taken into consideration in the choice of design table?
- Have both slabs adjacent to the Isokorb® been verified for bending and shear capacities by the Engineer of Record (EOR)?
- Has the maximum permissible expansion gap spacing been taken into consideration for the specific slab configuration?
- Have the horizontal loads such as those from wind pressure or seismic loading been taken into consideration? Additional CEQ modules may be required.
- Has the connecting reinforcement in the balcony and interior slabs been defined by the Engineer of Record (EOR)?
- When using Schöck Isokorb® in a pre-cast application, has a cast-in-place strip of concrete (width ≥ 50 mm [2"] from any compression modules) been specified in the design plans?