TOGE TSM BC SB VS

Bridge cap anchor for existing or prefabricated caps of DB bridges or subsequent fastening

Approval
Approval of the Federal Railway Authority for alternating fatigue loading up to 5 million load cycles as defined in DB Ril 804.

Approved by building authorities as shear-connector.

Cost saving
Application as subsequent anchoring of the bridge cap to the superstructure – enormous cost saving by retaining the existing cap.

Force Transmission
Transmission of forces in existing concrete by the undercutting technique in combination with chemical mortar.

Force transmission in new concrete via shear studs (hexagonal head or shear stud washer).

Installation
Fast and safe Installation.

Impermeability
Verification of the impermeability of the system without or after alternating load.

Approval

Approval
General type approval + General technical approval Z-21.1.1799.

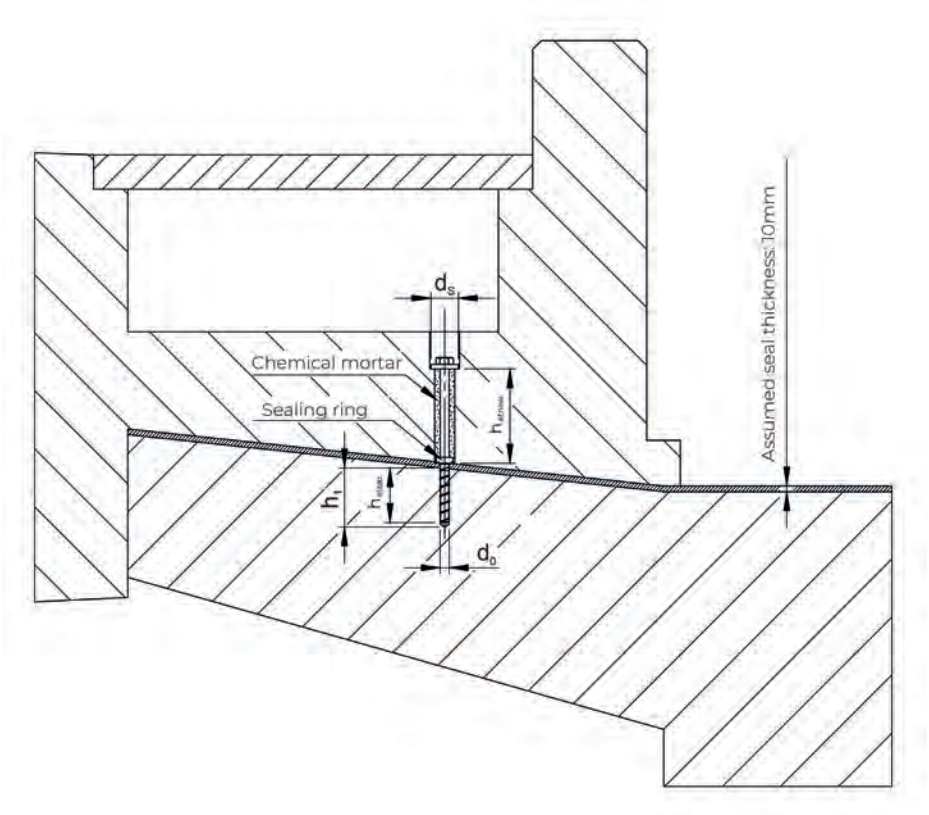
General type approval + General technical approval Z-21.1-1880.

Federal Railway Authority approval 213.3-213izbia/005-2101#009

Federal Railway Authority approval 213.3-213izbia/005-2101#011

Base Materials
Application in cracked and non-cracked concrete of strength classes from C20/25 to C50/60.

Technical Data



Anchoring in the superstructure for subsequent fastening TSM BC SB VS

Anchor size			TSM BC SB 22 VS			
Screw length	**L**	**[mm]**	**270**	**315**	**345**	**450**
Nominal diameter of drill bit	d_0	[mm]	22			
Depth of drill hole	h_0 ≥	[mm]	100			
Effective anchorage depth	$h_{nom} = h_{ef}$ ≥	[mm]	100			
Minimum edge distance	C_{min} ≥	[mm]	80			
Minimum spacing	S_{min} ≥	[mm]	80			
Minimum base material thickness	$h_{min,alt}$ ≥	[mm]	h_{ef} + 100			
Hexagonal drive	SW	[mm]	17			
Design value of tension load in cracked and non-cracked concrete C20/25 [1) 2)]	$N_{Rd,c}$ ≥	[kN]	26,6			
Design value of shear force for steel failure without lever arm [1) 2)]	$V_{Rd,s}$	[kN]	71,4			
Design value of shear force for steel failure with lever arm [1) 2) 3)]	$V_{Rd,s,M}$ ≤	[kN]	64,8			
Nominal torque of tangential screwdriver		[Nm]	≤ 1000			

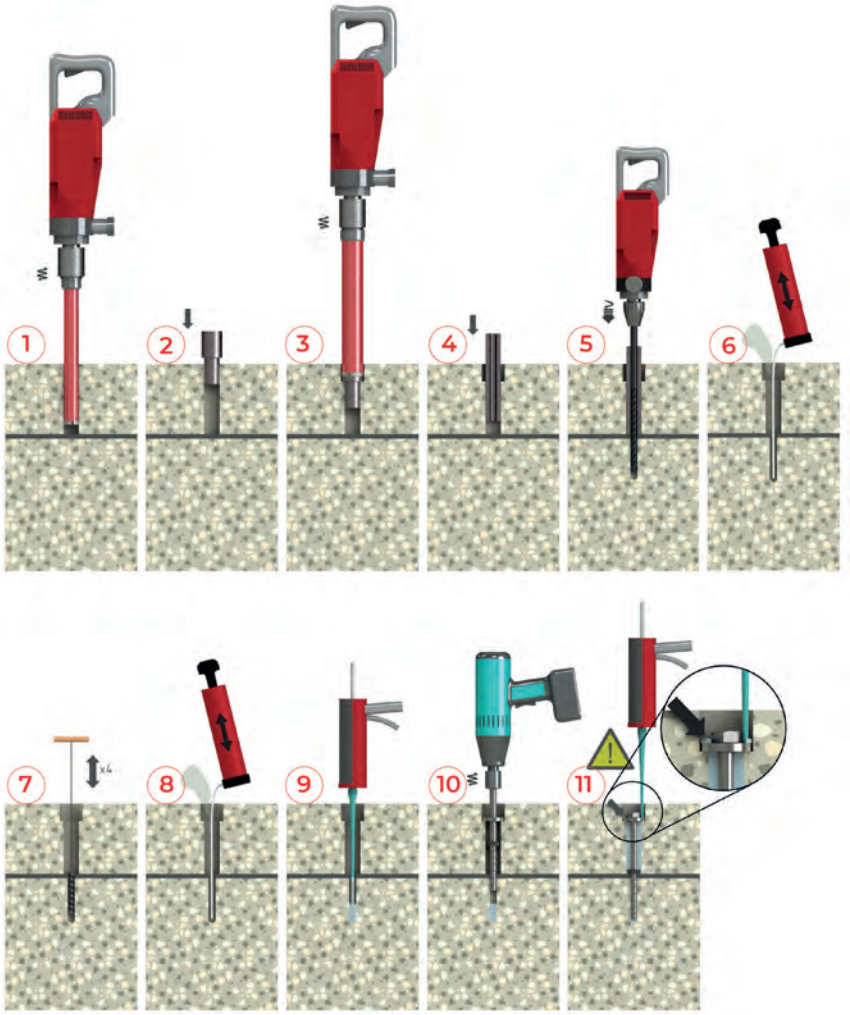
[1)] For the determination of the design values, the partial safety factor from the approval was taken into account on the resistance side.
[2)] The specified values apply regardless of center distances and edge distances.
[3)] For the determination of the shear force with lever arm bituminous waterproofing membrane of 8mm was applied.

Anchoring in the cap for subsequent fastening
TSM BC SB VS

Anchor size			TSM BC SB 22 VS			
Screw length	**L**	**[mm]**	**230**	**315**	**345**	**450**
Effective anchorage depth	$h_{ef,neu}$	[mm]	40 - 205			
Minimum edge distance	$C_{min} \geq$	[mm]	1,5 x $h_{ef, new}$			
Minimum spacing	$S_{min} \geq$	[mm]	3 x $h_{ef, new}$			
Minimum base material thickness	$h_{min, new} \geq$	[mm]	$h_{ef, new}$ + concrete cover			
Hexagonal drive	SW	[mm]	17			
Diameter head bolt	d_2	[mm]	60			
Design value of tension load in cracked concrete C20/25 [1) 2)]	$N_{Rd,c} \geq$	[kN]	6,8			
Design value of shear force for steel failure without lever arm [1) 2)]	$V_{Rd,s}$	[kN]	71,4			
Design value of shear force for steel failure with lever arm [1) 2) 3)]	$V_{Rd,sM} \leq$	[kN]	64,8			

[1)] For the determination of the design values, the partial safety factor from the approval was taken into account on the resistance side.
[2)] The specified values apply regardless of center distances and edge distances.
[3)] For the determination of the shear force with lever arm bituminous waterproofing membrane of 8mm was applied.

Installation Instructions



1) Create hole with 45 mm diameter.
2) Insert drilling aid for 65 mm diameter hole into the 45 mm hole.
3) Create a 65 mm diameter hole concentric to the 45 mm hole.
4) Insert the guide sleeve for the 22 mm hole into the 45 mm hole.
5) Drill a 22 mm hole concentrically to the 45 mm hole.
6) Thoroughly blow out the drill hole.
7) Brush the borehole 4x.
8) Thoroughly clean the 22 mm drill hole again.
9) Discard three full strokes of composite mortar – then inject composite mortar into 22 hole.
10) Screw the concrete screw into the 22 mm drill hole.
11) Brace backfill disc against edges of 65 hole using nut, fill 45 hole over backfill disc with composite mortar and grout 65 hole with suitable compound mortar.