TOGE TSM BS VS

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

Approval
Approved by building authorities as shear-connector.

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

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

Installation
Fast and safe installation.

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).
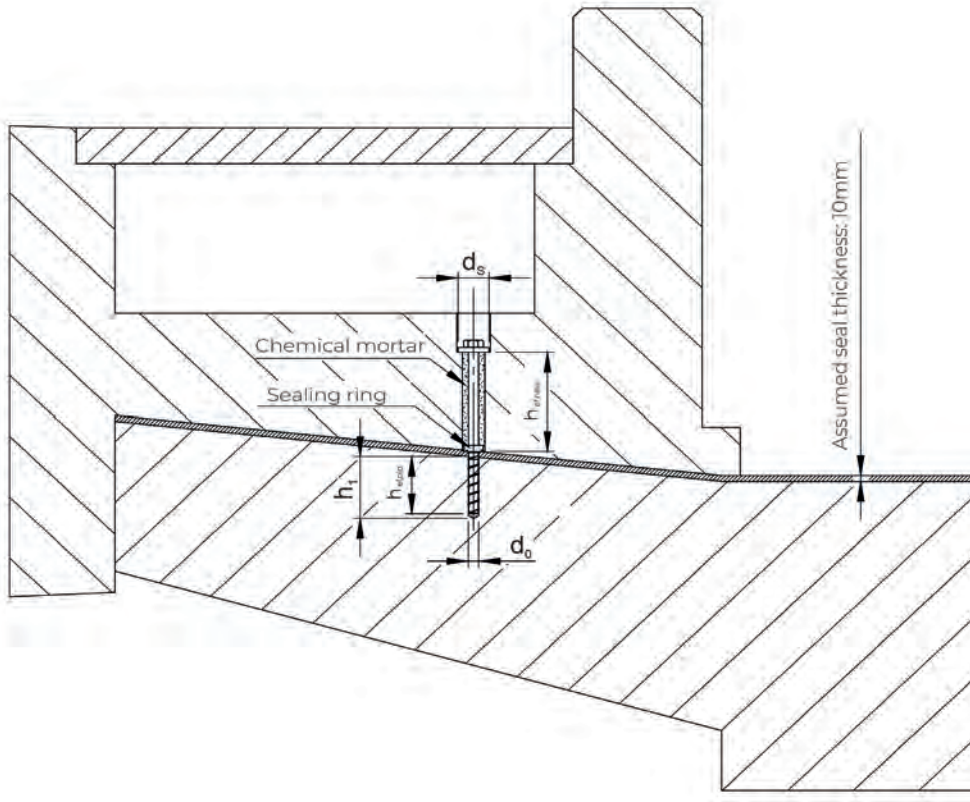
Approval

Approval

General type approval / General technical approval Z-21.1-1799.

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

Base Materials

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

Anchoring in the superstructure for subsequent fastening cap anchor TSM BS VS

Anchor size			TSM BS 16 VS		TSM BS 22 VS
Screw length	L	[mm]	230	275	290
Nominal diameter of drill bit	d_0	[mm]	16		22
Depth of drill hole	$h_0 \geq$	[mm]	110		110
Effective anchorage depth	$h_{nom} = h_{ef} \geq$	[mm]	100		100
Minimum edge distance	$C_{min} \geq$	[mm]	70		80
Minimum spacing	$S_{min} \geq$	[mm]	70		80
Minimum base material thickness	$h_{min,alt} \geq$	[mm]	$h_{nom} + 70$		$h_{nom} + 80$
Hexagonal drive	SW	[mm]	27		17
Design value of tension load in cracked and non-cracked concrete C20/25 [1][2]	$N_{Rd,c} \geq$	[kN]	26,5		26,5
Design value of shear force for steel failure without lever arm [1][2]	$V_{Rd,s}$	[kN]	76,8		85,6
Design value of shear force for steel failure with lever arm [1][2][3]	$V_{Rd,s,M} \leq$	[kN]	46,3		77,9
Nominal torque of tangential screwdriver		[Nm]	≤ 650		≤ 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.

Technical Data

## Anchoring in the cap for subsequent fastening
cap anchor TSM BS VS

Anchor size			TSM BS 16 VS		TSM BS 22 VS
Screw length	L	[mm]	230	275	290
Effective anchorage depth	$h_{ef,neu}$	[mm]	40 - 205		
Minimum edge distance	$C_{min} \geq$	[mm]	$1,5 \times h_{ef, neu}$		
Minimum spacing	$S_{min} \geq$	[mm]	$3 \times h_{ef, neu}$		
Minimum base material thickness	$h_{min, neu} \geq$	[mm]	$h_{ef, neu}$ + Betondeckung		
Hexagonal drive	SW	[mm]	27		17
Diameter head bolt	d2	[mm]	48		60
Design value of tension load in cracked and non-cracked concrete C20/25 [1] [2]	$N_{Rd,c} \geq$	[kN]	6,7		6,7
Design value of shear force for steel failure without lever arm [1] [2]	$V_{Rd,s}$	[kN]	64,0		71,3
Design value of shear force for steel failure with lever arm [1] [2] [3]	$V_{Rd,sM} \leq$	[kN]	38,6		64,9

[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
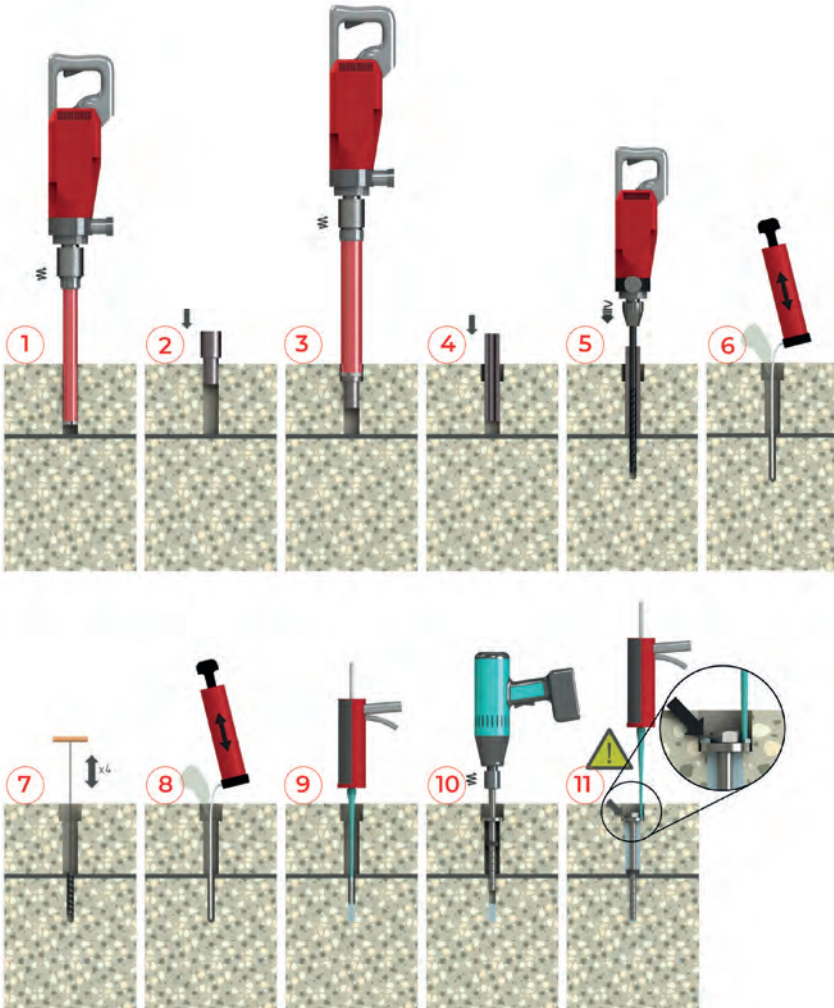
1) Create hole with 35 mm diameter.

2) Insert drilling aid for 52 mm diameter hole into the 35 mm h

3) Create a 52 mm diameter hole concentric to the 35 mm hole.

4) Insert the guide sleeve for the 16 mm hole into the 35 mm hole.

5) Drill a 16 mm hole concentrically to the 35 mm hole.

6) Thoroughly blow out the borehole.

7) Brush the borehole 4x.

8) Thoroughly clean the 16 mm borehole again.

9) Discard three full strokes of composite mortar – then inject composite mortar into 16 mm hole.

10) Screw in the concrete screw until the backfill disc rests on the edges of the 52 borehole.

11) Fill the 35 mm hole over the backfill disc with composite mortar and fill the 52 mm hole with suitable mortar.