

TOGE TSM BC SB

Bridge cap anchor for new cap construction for bridges DB with dynamic loading



Approval

Approval by the German Federal Railway Authority for alternating fatigue loading up to 5 million load cycles as defined by DB RIL 804 for TSM BC SB 22 M24.

Approved by building authorities as shear-connector.

Impermeability

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

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

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General type approval + general technical approval Z-21.1-1799.

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

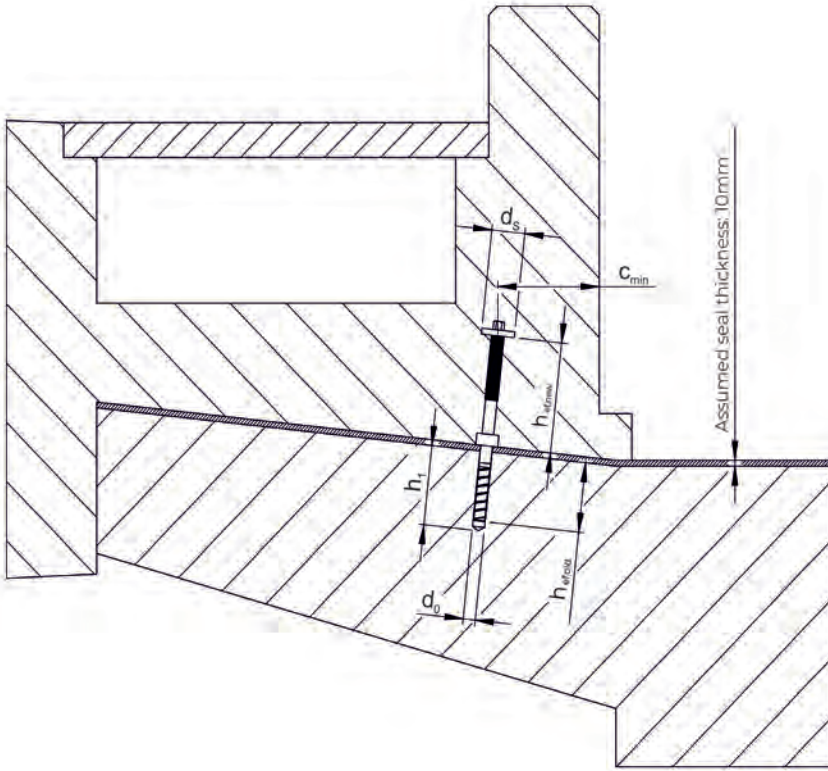
Federal Railway Authority approval 213.3-213izbia/005-2101#009

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.





Anchoring in superstructure for new in-situ concrete construction Cap anchor TSM BC SB

Anchor size			TSMBC SB 22			
	L	[mm]	270	315	345	450
Screw length	L	[mm]	270	315	345	450
Nominal diameter of drill bit	d_o	[mm]	22			
Depth of drill hole	$h_o \geq$	[mm]	100			
Effective anchorage depth	$h_{nom} = h_{ef} \geq$	[mm]	100			
Minimum edge distance	$c_{min} \geq$	[mm]	80			
Minimum spacing	$s_{min} \geq$	[mm]	80			
Minimum base material thickness	$h_{min,alt} \leq$	[mm]	$h_{ef} + 100$			
Hexagonal drive	SW	[mm]	17			
Design value of tension load in cracked and non-cracked concrete C20/25 ^{1) 2)}	$N_{Rd,C} \geq$	[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.

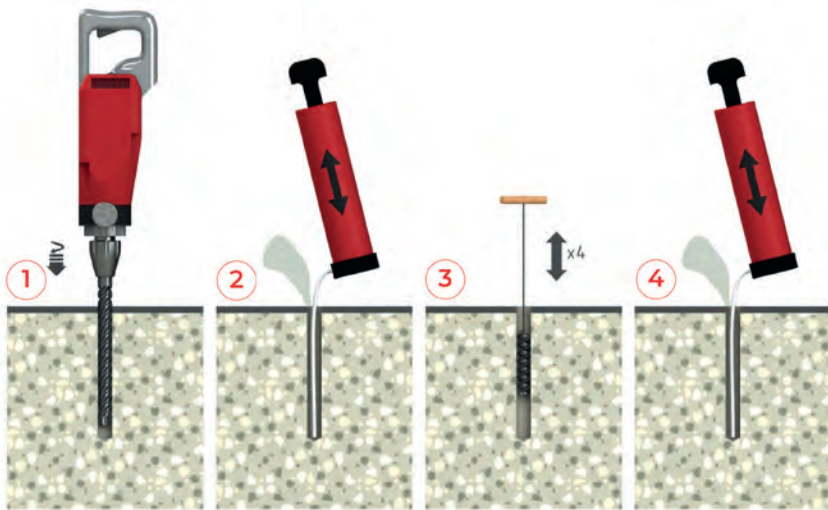
Anchoring in the cap for new in-situ concrete construction Cap anchor TSM BC SB

Anchor size			TSM BC SB 22			
Screw length	L	[mm]	230	315	345	450
Effective anchorage depth	$h_{ef,new}$	[mm]	40 - 205			
Minimum edge distance	$C_{min} \geq$	[mm]	$1,5 \times h_{ef,new}$			
Minimum spacing	$S_{min} \geq$	[mm]	$3 \times h_{ef,new}$			
Minimum base material thickness	$h_{min,new} \geq$	[mm]	$h_{ef,new} + \text{concrete cover}$			
Hexagonal drive	SW	[mm]	17			
Diameter head bolt	d2	[mm]	60			
Design value of tension load in cracked and non-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.



- 1) Create borehole.
- 2) Thoroughly blow out the borehole.
- 3) Brush the borehole 4x.
- 4) Thoroughly clean the borehole again.
- 5) Discard three full strokes of composite mortar – then inject composite mortar.
- 6) Screw in concrete screw.
- 7) After reaching the screw-in depth, the composite mortar must emerge at the concrete surface. Screw in the head bolt washer to the correct height.

