



Event Report for Industrial Visit
Infrastructure Engineering and Management

Titled:

*Industrial Visit to Cable Stayed Bridge Over Narmada
Canal*

Date: 07.02.24

Organised By:

Department Of Civil Engineering

School Of Technology

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Purpose of visit: To understand various components of the Cable-stayed Bridge, method & construction method by understanding the challenges and maintain safety operation.

7th January,2024 we have visited to Ahmedabad-Gandhinagar, Narmada Canal to understand various components of the Cable-Stayed bridge. We have seen and understood the methodology for the construction of the bridge by keeping safety into consideration. We have seen the components required to construct bridge.





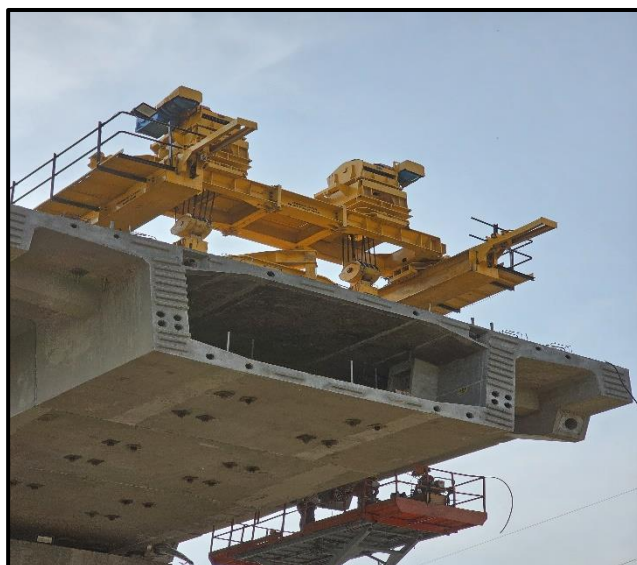
- **A cable-stayed** has one or more *towers (or pylons)*, from which cables support the bridge deck. A distinctive feature are the cables or stays, which run directly from the tower to the deck, normally forming a fan-like pattern or a series of parallel lines.
- This contrasts with the modern suspension bridge, where the cables supporting the deck are suspended vertically from the main cable, anchored at both ends of the bridge and running between the towers. The cable-stayed bridge is optimal for spans longer than cantilever bridges and shorter than suspension bridges. This is the range within which cantilever bridges would rapidly grow heavier, and suspension bridge cabling would be more costly.

1. SEGMENT LIFTER:

Segment Lifter is used in the construction of precast segmental balanced cantilever bridges, where pre-casting is possible, and the segment can be transported below the span.

The self-launching segment lifter is launched through hydraulic system which gives a safe launching for the equipment. The segment lifter allows faster erection and is therefore addressed to bridges with a great number of spans. Segment lifters are consisting of structural steel; however, a segment lifter is not required to span from one pier to the next and therefore it does not contain as much steel as the launching truss.

Two segment lifters work in tandem with its mirror equivalent, with one lifter erecting in one direction from the pier and the second lifter erecting in parallel in the opposite direction.



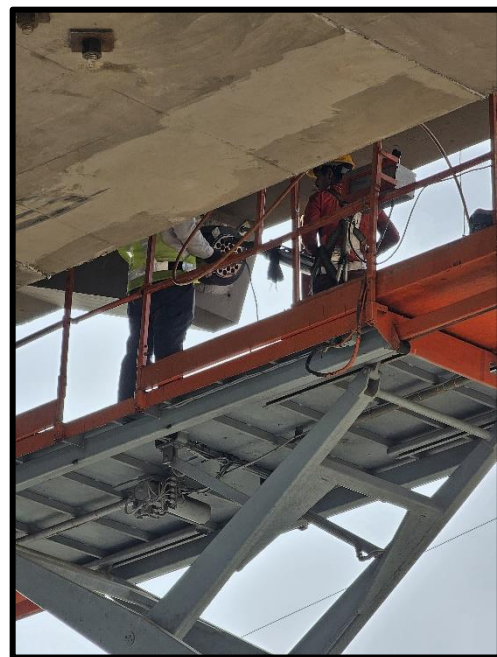
2. INSTALLATION OF CABLE:

Step-1: Dampers are installed onto cables to suppress cable vibration. Because the damper changes the cable's natural frequencies, the damper is removed from the cable, the cable's tension without a damper is estimated using the vibration and higher-order vibration methods, and then the damper is reinstalled.

Step-2: Cutting of Strands as per length required and Installing in the pipe on end on the Anchor Plate of the Pylon and other to the segment end and cutting the remaining wire after applying the tension on the Stands by using Hydraulic Jack. At last, the wedge is installed on the either side of the Stands to sustain stress, thus it is Post Tensioned wire and hold the upcoming loads.



DAMPER



POST-TENSIONING

Other observed instruments used to construction the metro-station such as

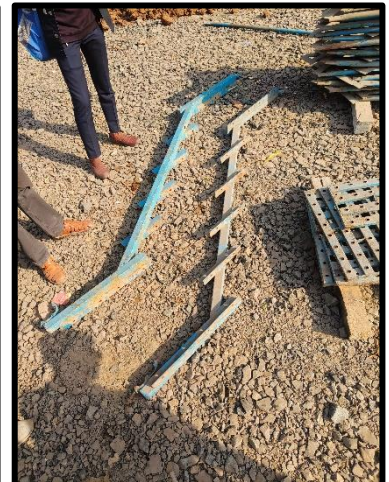
- Doka Stair Tower
- Powder coated Laminated plywood (Shuttering Ply)
- Wheel mounted Beam Telescopic Crane to Lift loads.
- Vertical supports (Vertical jacks)

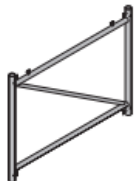
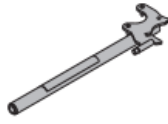












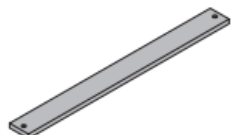
Doka Stair Tower: Doka Stair Tower is the stairs structure made with the 90% high tension aluminum and 10% Stainless Steel to made it light weight and Corrosion resistant as these will always be exposed to extreme climate or in the touch of the water thus, to make it more reliable it is made of such materials.

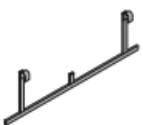

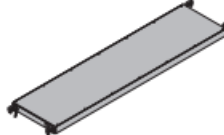


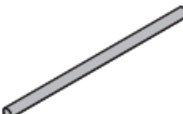



Size of Stair 5' x 8' 4-leg stair tower with 25" wide stairs


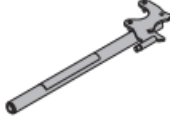
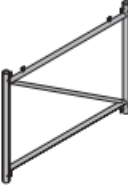


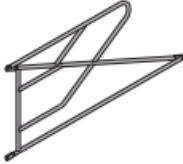



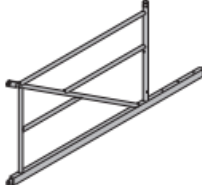



- Perfect for tight areas
- Compatible with Staxo shoring for easy integration with only a few parts
- Meets OSHA requirements
- Lightweight, pre-assembled aluminum stair units with non-slip grooved treads for safe and fast assembly
- High Load capacity – with or without netting
- Safe lifting by crane in large units without dis-assembly and re-assembly by hand.

Installation : Installation is simple as it is a cup lock system so all the components are placed over each other, and the tower stair is erected.



	[kg]	Article n°		[kg]	Article n°
Basic frame d2 1.20m Grundrahmen d2 1,20m  Galvanised	24.1	582701000	Universal dismantling tool Universal-Lösewerkzeug  Galvanised Length: 75.5 cm	3.7	582768000
Coupler Kupplungsstück  Galvanised Height: 27 cm	0.57	582527000	Stair bracket 225 right Stair bracket 225 left Treppenlauf 225  Galvanised Length: 263 cm Height: 111 cm	24.6	582681000 24.6 582682000
Spring locked connecting pin 16mm Federbolzen 16mm  Galvanised Length: 15 cm	0.25	582528000	Pin 7x60mm Steckbolzen 7x60mm  Galvanised	0.02	582683000
Diagonal brace d2 12.225 Diagonalstrebe d2 12.225  Galvanised	6.0	582717000	Inner handrailing 225 Innenholm 225  Galvanised Height: 111 cm	5.7	582685000
Horizontal brace d2 225 Horizontalstrebe d2 225  Galvanised	3.4	582735000	Intermediate railing 225 Zwischengeländer 225  Galvanised Length: 87 cm Height: 114 cm	5.7	582686000
Screw jack foot Fußspindel  Galvanised Height: 69 cm	9.0	582637000	Connection angle 225 Anschlusswinkel 225  Galvanised Height: 116 cm	6.0	582687000
Heavy duty screw jack 70 Lastspindel 70  Galvanised Height: 101 cm	8.8	582639000	Split nut B Spannmutter B  Galvanised	2.0	582634000
			Railing board 15x160cm Geländerdiele 15x160cm  Varnished yellow	4.0	183011000

	[kg]	Article n°		[kg]	Article n°
Landing railing 250 Podestgeländer 250  Galvanised Length: 160 cm Height: 48 cm	6.3	582673000	Scaffold planking 60/60cm Scaffold planking 60/100cm Scaffold planking 60/150cm Scaffold planking 60/175cm Scaffold planking 60/200cm Scaffold planking 60/250cm Scaffold planking 60/300cm Gerüstbelag Aluminium	6.1	582330500 9.5 582306500 13.6 582307500 15.5 582332500 17.8 582308500 22.2 582309500 26.2 582310500
Anchoring shoe for stair tower Ankerschuh für Treppenturm  Galvanised Length: 22 cm Width: 12 cm Height: 22 cm	3.4	582680000			
Cone screw B 7cm Konusschraube B 7cm  red Length: 10 cm Diameter: 7 cm Width-across: 50 mm	0.86	581444000	Warning sign "No entry" 300x300mm Verbotsschild "Zutritt Verboten" 300x300mm 	0.70	581575000
Scaffold tube 48.3mm 1.00m Scaffold tube 48.3mm 1.50m Scaffold tube 48.3mm 2.00m Scaffold tube 48.3mm 2.50m Scaffold tube 48.3mm 3.00m Scaffold tube 48.3mm 3.50m Scaffold tube 48.3mm 4.00m Scaffold tube 48.3mm 4.50m Scaffold tube 48.3mm 5.00m Scaffold tube 48.3mm 5.50m Scaffold tube 48.3mm 6.00m Scaffold tube 48.3mmm Gerüstrohr 48,3mm  Galvanised	3.6	682014000			
	5.4	682015000			
	7.2	682016000			
	9.0	682017000			
	10.8	682018000			
	12.6	682019000			
	14.4	682021000			
	16.2	682022000			
	18.0	682023000			
	19.8	682024000			
	21.6	682025000			
	3.6	682001000			
Transition swivel coupler 48/76mm Übergangsdrehkupplung 48/76mm  Galvanised Width-across: 22 mm	1.9	582563000			
Swivel coupler 48mm Drehkupplung 48mm  Galvanised Width-across: 22 mm	1.5	582560000			
Normal coupler 48mm Normalkupplung 48mm  Galvanised Width-across: 22 mm	1.2	682004000			

	[kg]	Article n°		[kg]	Article n°
Staxo 100 frame 1.20m Staxo 100-Rahmen 1,20m 	28.0	582301000	Galvanised	Universal dismantling tool Universal-Lösewerkzeug 	3.7 582768000
				Galvanised Length: 75.5 cm	
Basic frame d2 1.20m Grundrahmen d2 1,20m 	24.1	582701000	Galvanised	Alu stair bracket 250 Alu-Treppenlauf 250 	33.2 582670000
				Aluminium Length: 263 cm Width: 80 cm Height: 112 cm	
Coupler Kupplungsstück 	0.57	582527000	Galvanised Height: 27 cm	Outer railing 250 Außengeländer 250 	19.5 582672000
				Galvanised Length: 255 cm Height: 111 cm	
Spring locked connecting pin 16mm Federbolzen 16mm 	0.25	582528000	Galvanised Length: 15 cm	Inner railing 250 Innengeländer 250 	7.0 582671000
				Galvanised Height: 155 cm	
Screw jack foot Fußspindel 	9.0	582637000	Galvanised Height: 69 cm	Access railing 250 Einstiegsgeländer 250 	36.5 582675000
				Galvanised Length: 255 cm Height: 117 cm	
Heavy duty screw jack 70 Lastspindel 70 	8.8	582639000	Galvanised Height: 101 cm	Access support 250 Einstiegsadapter 250 	12.6 582674000
				Galvanised Height: 238 cm	
Split nut B Spannmutter B 	2.0	582634000	Galvanised		

Powder Coated Laminated plywood (Shuttering Ply)

Powder Coated Laminated Ply is recently used for the lighter weight to provide the mold to the concrete and the main function of it is to provide smooth surface to the concrete filled in thus, making surface smoother and maintaining the aesthetic of the surface.

While it has the two-side laminated thus making it usable for two time when in short of shuttering materials. And reliable and eco-friendly product.



Wheel mounted Beam Telescopic Crane to Lift loads.

Wheel mounted Crane are used to move heavy weight on the site here the 'ESCORTS' manufactured Crane was used for moving heavy weight on the site

This crane can be used to move the load and lift the Loads in such configuration 23,20,17,14,1 Ton load

As the name suggests Telescopic it refers to operate in telescopic directions, Wheel Mounted to be operated on the wheels, Beam the load bearing of the crane is on a beam, while this kind of the crane can move while lifting the load thus, making it the crane to lift the weight while moving and perform the lifting and moving operations at the same time.



Vertical supports (Vertical jacks)

Vertical supports are the supports which supports the Beam or slab bottoms or act as the support to any kind of structure to withstand the load.

It is a temporary kind of structure to withstand the load.

It as the components Called jack which act as the support to get slab/ beam bottom attained its height.

It has following components such as wooden H-Beam (Doka Beam) which takes all the horizontal load and transmit the load to the verticals of the vertical support same as the buildings beam takes all the horizontal load of the building and transmit It to the columns.

These H-Beams are followed by the U-Clamp or Square Clamp to fix the H-Beam on it its position and act as the junction of the H-Beam and the Verticals of the supports

These verticals are of specific height and interlinked into each other so that the desired height is attained by locking the pin between the verticals Thus, at last followed by base plate.

