

Zeitschrift: IABSE congress report = Rapport du congrès AIPC = IVBH
Kongressbericht

Band: 12 (1984)

Artikel: Cable stays for bridges

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DOI: <https://doi.org/10.5169/seals-12280>

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Cable Stays for Bridges

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DYWIDAG POSTTENSIONING SYSTEMS

Type of steel	Steel grade	(mm)	Nominal ultimate load kN					Bell anchorage	OR plate anchorage	Square ribbed plate anchorage	Rectangular ribbed pl. anchorage	Square solid plate anchorage	Rectangular solid plate anchorage	LO-plate anchorage	Ring plate anchorage	Multi area anchorage	Bond head anchorage	Loop anchorage	Coupler (movable)	Coupler (fixed)	Unbonded tendon	
			100	200	400	1000	2000															5000
Smooth bar	1420/1570	10	●					●											●	●	●	
		12,2	●					●											●	●	●	
	835/1230	26		●				●											●	●	●	
		32			●			●											●	●	●	
		36				●		●											●	●	●	
	1080/1230	26			●			●											●	●	●	
32					●		●											●	●	●		
36						●	●											●	●	●		
Thread bar	885/1080	15		●				●											●	●	●	
		16			●			●											●	●	●	
	835/1030	26,5			●			●											●	●	●	
		32				●		●											●	●	●	
		36					●	●											●	●	●	
	1080/1230	26,5			●			●											●	●	●	
32					●		●											●	●	●		
36						●	●											●	●	●		
Strand	1570/1770	10,6		●				●											●	●	●	
		3			●			●											●	●	●	
		4				●		●											●	●	●	
		5				●		●												●	●	●
		7					●		●											●	●	●
		9						●		●										●	●	●
		11							●											●	●	●
		12								●										●	●	●
15									●									●	●	●		
19										●								●	●	●		

DYWIDAG CABLES

Cable type	STRAND CABLE	BAR CABLE
LOAD BEARING 1 CABLE (Static+Dynamic)	STRAND (7-wire stress-relieved) Grade St 1570/1770 Diameter 0,6" (Low relaxation)	THREADED BARS STEEL TUBES Grade St 835/1030 Grade St 37 Dia. 32, 36 mm (DIN 17 100)
2 ANCHORAGE Static Dynamic Bending	WEDGE ANCHORAGE Combined WEDGE+BOND ANCHOR STEEL TUBES	NUT ANCHORAGE BOND ANCHORAGE STEEL TUBES
CORROSION PROTECTION	Multiple anti-corrosion barriers to meet different requirements eg SHEATHING, GROUT, COATING OF STRANDS etc	eg STEEL TUBES, GROUT etc
PRESTRESSING	SINGLE and MULTIPLE STRAND-JACKS	SINGLE BAR-JACKS
CABLE ERECTION	Different procedures to fit into various construction demands eg Erection on site, Prefabrication	
ADDITIONAL FEATURES	FULLY REPLACABLE ADJUSTABLE before and after grouting	REPLACABLE ADJUSTABLE before grouting

CABLE STAYS FOR BRIDGES

CABLE STAYS		EXAMPLES (STRUCTURE AND CONSTRUCTION METHOD)			
<p>TYPICAL CROSS SECTION</p> <p>CONCRETE GRADE B 45- 90 / 35 CM 56 STRANDS TENDONS - 19 416 STIRRUP</p> <p>PROTECTIVE CONCR. LAYER WITH ADDIT. REINFORCEMENT IN VEHICLE IMPACT ZONE OF THE CONCRETE STAY</p> <p>CONSTRUCTION ON SCAFFOLDING WITH POST-TENSIONED PRESTRESSING</p> <p>STRUCTURAL CRITERIA</p> <p>THE CONCR. STAY IS DESIGNED AS BEAM WITH FIXED ENDS STRESSED BY AXIAL TENSION FORCE AND STRESSED BY BENDING MOMENTS DUE TO DEAD WEIGHT OF STAY AND DUE TO WIND LOAD.</p> <p>CHECK OF STRESSES FOR PRESTR. CONCRETE MEMBERS ACC. TO GERMAN CODE DIN 4227</p> <p>CHARACTERISTICS</p> <p>ALLOW TENS. FORCE/SQM OF CONCR. STAY 45-55 MN UNIFORM PRESTR. CONCR. DESIGN FOR TOTAL STRUCTURE INCL. STAY AND ANCHOR BLOCK.</p> <p>STRUCTURE WITH SMALL DEFLECTIONS</p> <p>PERFECT PROTECTION AGAINST CORROSION</p> <p>RELIABLE RESISTANCE AGAINST VEHICLE IMPACT AND SIMILAR DAMAGES</p> <p>NO MAINTENANCE</p> <p>POSSIBILITIES FOR INDIVID. ARCHITECT. DESIGN</p> <p>1/4" OF GIRDER SPAN AT 250 M APPROX. DUE TO DEAD WEIGHT OF CONCRETE STAY</p>	<p>DANUBE RIVER BRIDGE, METTEN, F.R.G.</p> <p>ELEVATION</p> <p>DETAIL C'</p> <p>DETAIL D'</p> <p>CONSTRUCTION STAGES</p> <p>INCREMENTAL LAUNCHING</p> <p>CASTING OF STAY ON SCAFFOLDING</p>	<p>FLOSSER BRIDGE, FRANKFURT/M, F.R.G.</p> <p>ELEVATION</p> <p>DETAIL A</p> <p>B-B</p> <p>C-C</p> <p>FREE CANTILEVER WITH TEMPORARY STEEL CABLES</p> <p>CASTING OF STAY ON SCAFFOLDING</p> <p>ARRANGEMENT OF FREE CANTILEVER SEGMENTS</p>	<p>DESIGN WITH CABLE STAYS ARRANGED BELOW GIRDER</p> <p>ELEVATION</p> <p>DETAIL A</p> <p>B-B</p> <p>C-C</p>		
	<p>COMPOSITE CROSS SECTION</p> <p>WIRE ST 125/1470, DIA. 16 MM (W) + STEEL TUBE (ST)</p> <p>FIXED END</p> <p>STEEL TUBE WITH INCREASED WALL THICKNESS</p> <p>LOAD TRANSFER AT ANCHORAGE</p> <p>DEAD LOAD VIA THREADS OF WIRE (T) FATIGUE LOADS VIA BOND ANCHORAGE ZONE II</p>	<p>MAIN RIVER BRIDGE, HOECHST AG, F.R.G.</p> <p>ELEVATION</p> <p>ANCHORAGE IN TOWER</p> <p>ANCHORAGE IN GIRDER</p> <p>TOP VIEW</p> <p>SIMULTANEOUS SEGMENTAL CONSTRUCTION</p>	<p>COMPOSITE CROSS SECTION</p> <p>WIRE ST 932/1279, DIA. 32 & 36 MM (B) + STEEL TUBE (ST)</p> <p>FIXED END</p> <p>STEEL TUBE</p> <p>LOAD TRANSFER AT ANCHORAGE</p> <p>DEAD LOAD VIA THREADS OF WIRE (T) FATIGUE LOADS VIA BOND ANCHORAGE ZONE II</p>	<p>PENANG BRIDGE, MALAYSIA</p> <p>ELEVATION</p> <p>ANCHORAGE IN TOWER</p> <p>ANCHORAGE IN GIRDER</p> <p>TOP VIEW</p> <p>SEGMENTAL CONSTRUCTION</p>	
	<p>COMPOSITE CROSS SECTION</p> <p>STRANDS ST 1560/1860, DIA. 0.6" (S)</p> <p>FIXED END</p> <p>ANCHOR STEEL TUBE</p> <p>LOAD TRANSFER AT ANCHORAGE</p> <p>DEAD LOAD VIA WEDGES OF STRANDS (T) FATIGUE LOADS VIA BOND ANCHORAGE ZONE II</p>	<p>FA ROUTE 63 OVER MISSISSIPPI RIVER, QUINCY, ILLINOIS, U.S.A.</p> <p>ELEVATION</p> <p>ANCHORAGE IN TOWER</p> <p>CONSTR. STAGES</p> <p>ANCHORAGE IN GIRDER</p>	<p>CONSTRUCTION STAGES</p> <p>INCREMENTAL LAUNCHING</p> <p>CASTING OF STAY ON SCAFFOLDING</p> <p>ARRANGEMENT OF FREE CANTILEVER SEGMENTS</p>	<p>CONSTRUCTION STAGES</p> <p>INCREMENTAL LAUNCHING</p> <p>CASTING OF STAY ON SCAFFOLDING</p> <p>ARRANGEMENT OF FREE CANTILEVER SEGMENTS</p>	