

# Contents

<b>Introduction</b>	1
<b>1 Scope</b>	1
<b>2 Definitions and symbols</b>	
2.1 Definitions	2
2.2 Symbols	4
<b>3 Design and detailing</b>	
3.1 General	5
(3.1.1 Redundancy of cable-stayed structures – 3.1.2 Fire, impact, vandalism – 3.1.3 Replaceability of stay cables – 3.1.4 Transverse loads applied from stay cables to the structure – 3.1.5 Bending stresses in stay cables)	
3.2 Design / sizing of stay cables	8
(3.2.1 Service conditions (SLS) – 3.2.2 Fatigue limit state (FLS) – 3.2.3 Ultimate limit state (ULS) – 3.2.4 Earthquakes – 3.2.5 Construction and cable replacement)	
3.3 Detailing and lightning protection	12
(3.3.1 Detailing – 3.3.2 Lightning protection)	
3.4 Saddles	17
(3.4.1 General – 3.4.2 Transfer of differential stay cable forces – 3.4.3 Minimum radius of curvature of saddle pipe)	
3.5 Execution aspects	18
(3.5.1 Stage-by-stage analysis – 3.5.2 Length adjustment capability of stay cables – 3.5.3 Construction tolerances)	
3.6 Cable vibrations	19
(3.6.1 General – 3.6.2 Special damping devices – 3.6.3 Cross ties)	
3.7 Inspection and maintenance	21
<b>4 Functional requirements for stay cables</b>	
4.1 Evolution of stay cable technology	22
4.2 General requirements	22
(4.2.1 General – 4.2.2 Durability design, corrosion protection)	
4.3 Requirements for the free length	24
(4.3.1 Corrosion protection philosophy for tensile elements – 4.3.2 Protection philosophy for other materials – 4.3.3 Reference system for corrosion protection – 4.3.4 Equivalent systems for corrosion protection – 4.3.5 Systems with lower corrosion protection – 4.3.6 Additional requirements)	
4.4 Requirements for the transition zones	28
(4.4.1 Corrosion protection – 4.4.2 Stay pipe dilation – 4.4.3 Guide deviators – 4.4.4 Damping of stay cables – 4.4.5 Anti-vandalism pipes)	
4.5 Requirements for anchorages	32
(4.5.1 Types of stay cable anchorages – 4.5.2 Corrosion protection philosophy for mild steel anchorage components – 4.5.3 Additional requirements)	
4.6 Requirements for saddles	35
(4.6.1 General – 4.6.2 Corrosion protection – 4.6.3 Saddle performance)	

<b>5</b>	<b>Materials: properties, requirements, testing</b>	
5.1	General	36
5.2	High tensile steel for tensile elements (prestressing steel)	37
	(5.2.1 General – 5.2.2 Hot dipped metallically coated prestressing steel)	
5.3	Structural steel for anchorages, saddles, guide deviators and pipes	39
5.4	Stainless steel	39
5.5	Sheathing for prestressing strands	39
5.6	Filling materials	41
	(5.6.1 Soft filling materials – 5.6.2 Hardening filling materials)	
5.7	Stay pipes and other pipes	43
	(5.7.1 General – 5.7.2 Thermoplastic stay pipes – 5.7.3 Steel stay pipes – 5.7.4 Other pipes)	
5.8	Guide deviators	46
5.9	Damping devices	46
<b>6</b>	<b>Testing of stay cable systems</b>	
6.1	General	46
6.2	Initial approval testing (qualification testing)	46
	(6.2.1 Anchorage fatigue and tensile testing – 6.2.2 Saddle fatigue and tensile testing – 6.2.3 Leak tightness testing)	
6.3	Suitability testing	55
6.4	Quality control testing	56
<b>7</b>	<b>Installation</b>	
7.1	General	58
	(7.1.1 Quality management system – 7.1.2 Qualification of personnel – 7.1.3 Execution documents)	
7.2	Shipment and storage of components	59
7.3	Assembly and installation	59
7.4	Stressing and adjustment	61
7.5	Corrosion protection	63
<b>8</b>	<b>Inspection and monitoring</b>	
8.1	General	64
8.2	Initial inspection	64
8.3	Routine inspection	64
8.4	Detailed inspection	65
8.5	Exceptional inspection	66
8.6	Monitoring	66
<b>9</b>	<b>Maintenance, repair, replacement and strengthening</b>	<b>66</b>
<b>10</b>	<b>References and literature</b>	
10.1	References	67
10.2	Standards	68
10.3	Extended literature	71