

**Zeitschrift:** IABSE reports = Rapports AIPC = IVBH Berichte

**Band:** 52 (1986)

**Artikel:** Construction technology of cables for suspension bridges

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**DOI:** <https://doi.org/10.5169/seals-40345>

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# Construction Technology of Cables for Suspension Bridges

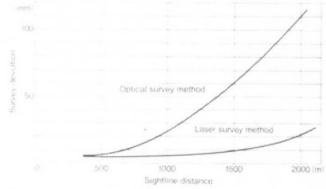
Nippon Steel Corporation

## Cable Construction of Ohnaruto Bridge

### Quality-Oriented Results

#### (1) Sag and Tower Displacement Survey Deviation

Laser measurement equipment was used to survey sag and tower displacement on Ohnaruto Bridge. Compared to tautsils and other conventional optical measuring equipment, this approach provided longer sightline distance when surveying at night, thereby ensuring sufficient precision.



#### (2) Cable Sag Measurement Results

Endless without unit markings are mm

Span	1A~3P Side Span		3P~3P Side Span		3P~4P Center Span		4P~5A Side Span	
	N	S	N	S	N	S	N	S
Target Sag Value	0.84(2m)		10.40(2m)		19.73(2m)		10.40(2m)	
At Erection of Cable Strand (Sag Allowance)	1.80		4.80		14.80		20.80	
When Squaring is Complete of Cable Center	96	128	107	96	39	61	57	75
Ohnaruto Bridge Results When Processing is Complete	59	27	53	90	100	75		

#### Impact of Relative Sag Deviation on Cable Stress

Span	S	Relative Sag Deviation to Target Value (%)	Cable Stress Increase (MPa)	Average of SR (kg/cm <sup>2</sup> )	
				Ohnaruto Bridge	Business Bridge
Side Span	3P~N	9.9	0.10	0.10	0.13
	4P~S	12.6	0.13	0.10	0.13
Center Span	3P~N	7.8	0.08	0.08	0.12
	4P~S	8.2	0.08	0.08	0.12

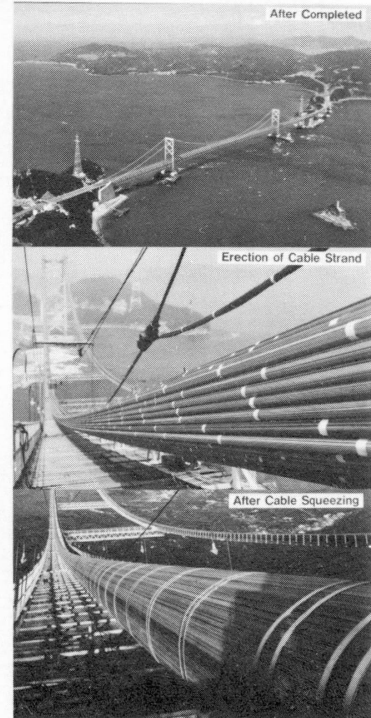
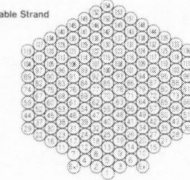
#### (3) Cable Percentage of Void After Cable Band Bolt Tightening

Bridge	Cable Diameter (mm)	Erection Method	Void Ratio of Cable	
			Plan(%)	Result(%)
George Washington	911	-	25.0	21.2
Golden Gate	919	AS	19.0	17.4
Tacoma Narrows	814	-	-	17.2
Forth Road	603	-	20.8	18.9
Salazar	596	-	16.8	20.8
New Port	387	PS	18.5	18.7
Kanmon Bridge	654	-	19.0	16.8
Hirado Bridge	366	AS	20.0	21.2
Imoshima Bridge	610	PS	17.0	17.2
Ohnaruto Bridge	829	PS	18.0	17.6

#### Specification of the Ohnaruto Bridge Cable

Galvanized Wire	Diameter	5.57mm
	Tensile Strength	160~180kg/mm <sup>2</sup>
	Amount of Wires Constituting Strand	PWS 127
Strand	Unit Weight	22.52kg/m
	Length	1722m
	Weight of Strand	39.0t
Cable	Amount of Strands Constituting Cable	154
	Diameter	842mm
	Amount of Wires Constituting Cable	19,558
	Total weight	11,962t

#### Arrangement of Cable Strand



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