

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

**Band:** 12 (1984)

**Artikel:** Cable damper of Meiko-Nishi Cable-Stayed Bridge

**Autor:** Iioka, Yutaka / Takahashi, Michio / Kajita, Nobukazu

**DOI:** <https://doi.org/10.5169/seals-12301>

### **Nutzungsbedingungen**

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

### **Conditions d'utilisation**

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

### **Terms of use**

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

**Download PDF:** 23.02.2026

**ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>**



## Cable Damper of Meiko-Nishi Cable-Stayed Bridge

**Yutaka IIOKA**  
Nihon Doro Kodan  
Nagoya, Japan

**Michio TAKAHASHI**  
Nihon Doro Kodan  
Hiroshima, Japan

**Nobukazu KAJITA**  
Shin-Nippon-Giken Eng.  
Tokyo, Japan

### 1. GENERAL

Meiko-Nishi Bridge, which is under construction in Nagoya Harbor, Japan, is a steel cable-stayed bridge with three spans of (175+405+175m). The box-girder type with an orthotropic deck is a trapezoidal 3-cell box-sections with the depth of 2.8 m. Pylons are A-frame fixed to piers. The longitudinal cable configuration is the fan type of twelve stay cables. This bridge was closed on July 16, 1984, and will be completed on April, 1985.

### 2. EARTHQUAKE RESISTANCE DESIGN

The construction site which is located in the strong seismic zone is in rather poor geotechnical condition. In the earthquake resistance design, following earthquakes are considered. The one is expected to occur 2~3 times for 100 years with  $M=8.0$  for the epicentral distance of 100 km, and the other is expected to occur 4~5 times with  $M=7.0$  for the epicentral distance of 50 km, in which  $M$  is the magnitude. Therefore, the design of pylons and substructures needs special considerations to the longitudinal earthquake force. The degree of horizontal connection between pylon and girder is one of the most important influence factors against the earthquake response, because of the large mass of the stiffened girders. Meiko-Nishi Bridge has been installed horizontal cables, called cable dampers, in the connection of pylon and girder to reduce the horizontal forces to the pylon from the stiffened girders. The earthquake force will be reduced, because the cable dampers give lower natural frequency and larger system damping to the structure.

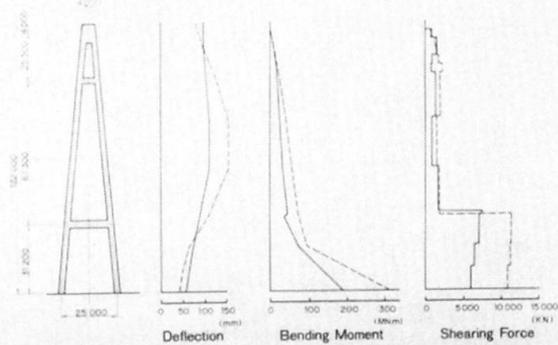
### 3. DIMENSION OF CABLE DAMPER

Material	2 bundles of 61 galvanized 7-wire strands	
Length (L)	43.2m	
Area (A)	$62.6 \text{ cm}^2 \times 2 = 125.2 \text{ cm}^2$	
Modulus of Elasticity (E)	$1.9 \times 10^7 \text{ t/m}^2$	
$EA/L$	$5.5 \times 10^3 \text{ t/m}$	
Prestretching	Center Span	—— 440 t
	Side Span	—— 415 t

# CABLE DAMPER OF MEIKO-NISHI CABLE STAYED BRIDGE

Meiko-Nishi Bridge, which is under construction in Nagoya Harbor, Japan, is a steel cable-stayed bridge with three spans of (175 + 405 + 175m). The box-girder type with an orthotropic deck is a trapezoidal 3-cell box-sections with the depth of 2.8m. Pylons are A-frame fixed to piers. The longitudinal cable configuration is the fan type of twelve stay cables.

Meiko-Nishi Bridge has been installed horizontal cables (2 bundles of 61 galvanized 7-wire strands) with the length of 43.2 m, called cable dampers, in the connection of pylon and girder to reduce the horizontal forces to the pylon from the stiffened girders. The earthquake force will be reduced, because the cable dampers give lower natural frequency and larger system damping to the structure.

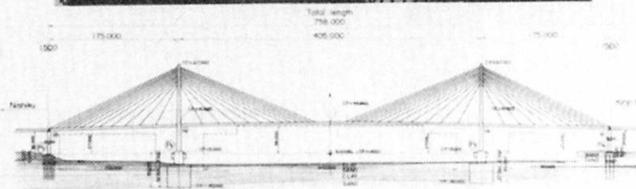


**PYLON**

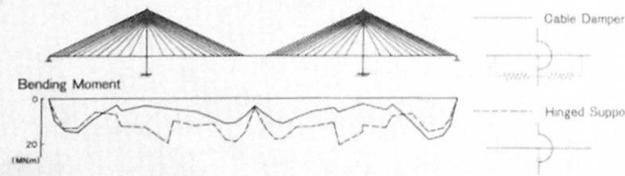
**DYNAMIC RESPONSES OF THE BRIDGE SYSTEM CONNECTED BETWEEN PYLON AND GIRDER BY CABLE DAMPER AND BY HINGED SUPPORT**



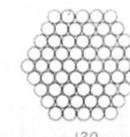
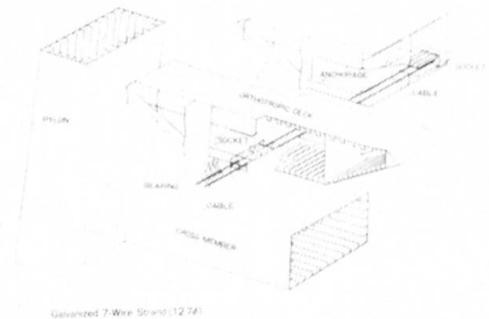
A-frame towers, the height of 104 m and the weight of 1250 ton, were hoisted into place by a 3000-ton floating crane in July, 1983



**GENERAL VIEW**



**GIRDER**



**SECTION OF CABLE DAMPER**

**DESIGN CONDITION OF CABLE DAMPER**

Area	62.59 cm <sup>2</sup>	
Length	43.2 m	
Design Load	Temperature	3567 kN
	Earthquake	10964 kN
Ultimate Load	10858 kN	