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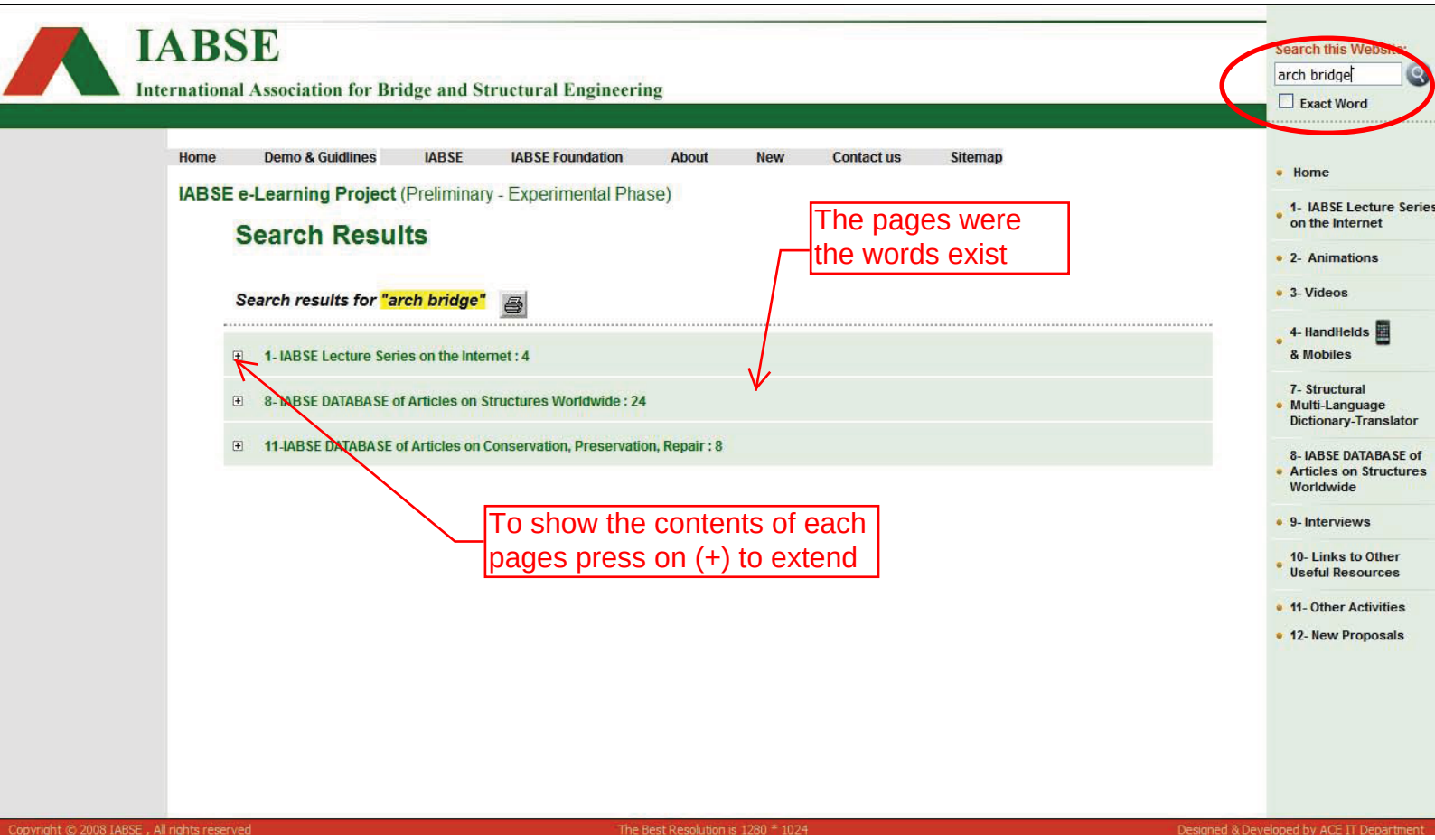

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Search Results

Search results for "arch bridge"

1- IABSE Lecture Series on the Internet : 4

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Lecture [8]: Great demand and great challenge - Chinese major bridge projects under construction for improving traffic infrastructure nationwide

by: Prof. Yaojun GE, Prof. H. F. Xiang

Summary: Under the background of high annual growth rates of GDP, China has experienced with the evergrowing demand in improving traffic infrastructure nationwide for about three decades, which results in intensive investment in traffic infrastructure development, in particular highway transportation construction. Two ground plans, the National Trunk Highway System and the National Expressway Network, have been launched successively, and thousands of highway bridges have been built for each year. In order to meet with the great demand in highway bridge development, Chinese bridge community is facing several challenges in the design and analysis of major bridges, especially of super long-span bridges. Aerodynamic challenge of suspension bridges was introduced by three typical examples including a single-box-girder with a central stabilizer, a twin-box-girder and a trial design with the combination of stabilizers and central slotted decks. Bridging capacity challenge was explained by three cable-stayed bridges with about 1000 m main span and a record-breaking span-length arch bridge. The other technical challenge was focused on the rational design and analysis of a double main span suspension bridge and a twin parallel deck cable-stayed bridge.

Keywords: Suspension bridge; Span length; Potential requirement; Technological Feasibility;aerodynamic limitation

Lecture [9]: Evolution of Bridges

by: Dr. Man-Chung Tang

Summary: The evolution of bridge technology can be divided into two major eras: The Arch Era, from 2000 BC to the end of 18th century, was dominated by the Roman structures. They were practically all stone arches. The Contemporary Era that followed and continues today, flourished after steel was commercially available as a construction material in the mid 19th century. All modern bridge types including girder bridges, cable-stayed bridges, suspension bridges and arch bridges, especially those with larger spans, have been possible only because of the high strength of steel, both in compression and in tension.

Keywords: Bridges, Bridge evolution, Stone bridges, Steel bridges, Concrete bridges, Bridge technology

Lecture [20]: About the Network Arch

by: Per Tveit, dr. ing, Docent Emeritus

Summary: The optimal network arch is a steel arch bridge with a concrete tie. Some hangers cross each other at least twice. The optimal network arch makes good use of high strength steels. The bridge type normally saves between 50% to 75% of the steel compared to other steel bridges. The welds are short and the cost of fabrication is low. The partially prestressed concrete tie and the small steel surfaces give low maintenance costs. Nevertheless the cost of the steel per tonne will be moderate. For detailed information on network arches refer to Ref. [1] The Brandanger Bridge in Norway currently under design will have a span of 220 m . Preliminary investigations indicate that approximately 40% of the cost can be saved by using a network arch instead of a beam bridge. For many equal spans above navigable water high strength concrete can be used in the arches of spans that are floated to the pillars. (From the introduction of the paper entitled: "An Introduction to the Optimal Network Arch", published in the IABSE SEI Journal 2/2007)

Keywords: Bridge, Network Arch, Cable, Rail, Road

Lecture [35]: China s Major Bridges

by: Prof. Maorun FENG

Summary: In response to continuous economic development over the past 30 years, China has mobilized a program of large scale bridge construction. The technology of various types of bridges, including girder bridges, arch bridges, and cable-supported bridges, has been developed rapidly. Bridge spanning capacity has been continuously improved. Girder bridges with main span of 330 m, arch bridges with main span of 550 m, cable-stayed bridges with main span of 1088 m and suspension bridges with main span of 1650 m have already been built. Moreover, two sea-crossing bridges with overall length over 30 km have also been opened to traffic. This presentation briefly introduces China's major bridges, including girder bridges with spans greater than 200 m, arch bridges with spans greater than 400 m, cable-stayed bridges with spans greater than 600 m, and suspension bridges with spans greater than 1200 m. These bridges represent technological progress in such aspects as structural system, materials, as well as construction methods and equipment.

Keywords: girder bridge, arch bridge, cable-supported bridge, cable-stayed bridge, suspension bridge, steel-concrete composite bridge

8- IABSE DATABASE of Articles on Structures Worldwide : 24

Sacramento River Pedestrian Bridge

by: C. Redfield, J. Strasky,, 1991_N4_p19-21

Summary: The Sacramento River trail and connecting bridge form part of the City of Redding's park system. This area of the park lies to the northwest of the city on both sides of the river extending upstream about 4 km to Keswick Dam. Because of the dam's presence, the banks of the river directly downstream have extensive rock outcropping which dramatically add to the beauty of the river basin. The new bridge, located at this juncture provides a link between the previously separated trails lying just above the rocky areas on each bank and thus completes a 8 km trail loop when combined with an old arch bridge at the other end.

Keywords: Sacramento River Pedestrian Bridge (USA); Pedestrian bridges; Stress ribbon design; Static and dynamic analysis; Bridge construction; Bridge design; Load tests

The Mur River Wooden Bridge

by: R. Pischl, G. Schickhofer,, 1993_N4_p217-219

Summary: In 1989, the construction of a bridge spanning the Mur River was proposed to connect the communities of St. Georgen/Murau and St. Lorenzen/Murau. The successful design is a wooden bridge with a parabolic three-hinged arch. The arch functions as the main girder as well as a principal aesthetic element. Connection elements are entirely of steel. The Mur River Bridge is classified as Class I, in accordance with Austrian code Ã–NORM B 4002. This means each traffic direction must sustain a load on adjacent lanes of a 25 t truck, or

and a record-breaking span-length arch bridge. The other technical challenge was focused on the rational design and analysis of a double main span suspension bridge and a twin parallel deck cable-stayed bridge.

Keywords: Suspension bridge; Span length; Potential requirement; Technological Feasibility;aerodynamic limitation

E-Learning_IABSE Lecture [20]: About the Network Arch

by: Per Tveit,, LSI_2008

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Keywords: Bridge; Network Arch; Cable; Rail; Road

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Probability-Based Assessment and Optimised Maintenance Management of a Large Riveted Truss Railway Bridge

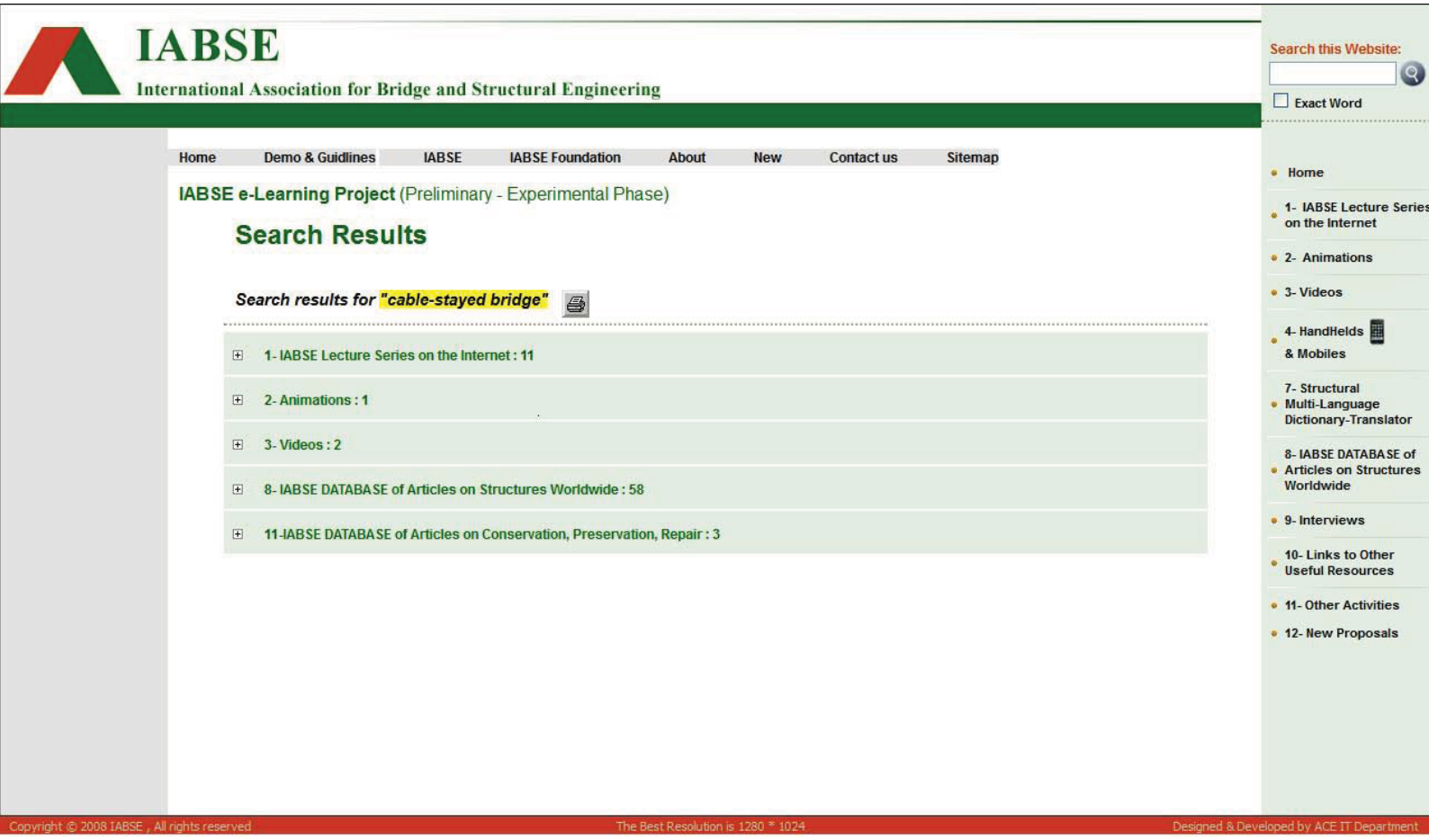
by: O'Connor, Alan; Pedersen, Claus; Gustavsson, Lars; Enevoldsen, Ib, 2009_N04_p375-382

Summary: This paper describes the techniques used in a probabilistic assessment of a riveted truss railway bridge. The probability-based classification of the structure serves as an example of how probability-based assessment of railway bridges can be applied to reduce maintenance costs through avoidance of unnecessary repair/rehabilitation and/or to optimise those repairs that are shown to be necessary. Probabilistic modelling of the critical limit states is presented for both the elements and the riveted joints of the structure. The statistical techniques used in modelling the train loads are presented, with modelling of the train load extreme value distributions (EVDs) based on the number of wagons loading the critical length of an influence line for the considered element/joint. Modelling of dynamic amplification of specific static sectional forces is performed as a function of the local or global influence length for the element or joint. Thereby, the significant conservatism found to be inherent in the deterministic assessment was avoided. The overall aim of the analysis was to achieve a higher load rating for element/joints of the structure than those resulting from the deterministic assessment. The sensitivity of the reliability index to the modelled stochastic variables is presented. Ultimately, the economic benefits to bridge owners/managers of performing a probabilistic assessment are apparent from the results, which provided a higher load rating for the critical elements/joints of the steel arch bridge than those achieved through deterministic assessment. The results of the probabilistic assessment were not able to demonstrate sufficient capacity in all the cases, but in those cases, as demonstrated in the paper, probabilistic modelling was used to plan the optimal repair strategy.

Keywords: Railway Bridge; Train Loading; Assessment; Structural Safety; Maintenance Optimisation

Probability-Based Assessment and Optimised Maintenance Management of a Large Riveted Truss Railway Bridge

Search results for "Cable-Stayed Bridge"



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Lecture [5]: Increasing the Load Capacity of Major Bridges

by: Dr. Peter G. Buckland

Summary: By the use of examples from the Authors' experience, various methods are shown of increasing the load capacity of major bridges, while keeping traffic flowing all or most of the time. These methods include refined calculations of loads and load factors, "prestressing" the hangers of a suspension bridge, altering load paths, converting a suspension bridge into a cable-stayed bridge,replacing the suspended structure of a suspension bridge, altering the steel grade of a suspension bridge, and making the roadway deck composite with the main structure. (Summary from the paper entitled: " Maintenance and Rehabilitation of Large Infrastructure Projects, Bridges and Tunnels" published in the IABSE Conference, Copenhagen, Denmark, 2006 May 15-17)

Keywords: Bridge, Existing, Major, Suspension, Cable-stayed, Load, Upgrading.suspension bridge, deck replacement, orthotropic deck, renovation.

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by: Prof. Yaojun GE, Prof. H. F. Xiang

Summary: Under the background of high annual growth rates of GDP, China has experienced with the evergrowing demand in improving traffic infrastructure nationwide for about three decades, which results in intensive investment in traffic infrastructure development, in particular highway transportation construction. Two ground plans, the National Trunk Highway System and the National Expressway Network, have been launched successively, and thousands of highway bridges have been built for each year. In order to meet with the great demand in highway bridge development, Chinese bridge community is facing several challenges in the design and analysis of major bridges, especially of super long-span bridges. Aerodynamic challenge of suspension bridges was introduced by three typical examples including a single-box-girder with a central stabilizer, a twin-box-girder and a trial design with the combination of stabilizers and central slotted decks. Bridging capacity challenge was explained by three cable-stayed bridges with about 1000 m main span and a record-breaking span-length arch bridge. The other technical challenge was focused on the rational design and analysis of a double main span suspension bridge and a twin parallel deck cable-stayed bridge.

Keywords: Suspension bridge; Span length; Potential requirement;

Lecture [40]: Recent Major Bridges in Korea

by: Prof. Hyun-Moo KOH

Summary: During a relatively short period, bridge technology in Korea has recognized outstanding development. Owing to the governmental policy aiming to achieve balanced regional development, unprecedented bridge construction activities are conducted in the peninsula, especially in the southwestern coast to link some of the 3,000 islands with the mainland. Korean bridge engineers are now designing and constructing bridges using domestic technology, which has today reached a level enabling to realize the erection of numerous sea-crossing bridges counting among the longest in the world like Incheon cable-stayed bridge (main span 800m) and Gwangyang suspension bridge (main span 1545m). This presentation reviews the evolution of modern bridge construction in Korea and presents major bridges recently erected or to be built. R&D programs dedicated to the advancement of bridge technology are also introduced.

Keywords: Bridge Technology, Sea-crossing Bridges, Cable-Supported Bridges, R&D programs.

2- Animations : 1

Animation [1]: Sutong Bridge Cable Stayed Segment

by: Mr. H. F. Xiang

Keywords: Sutong Bridge, Cable Stayed Segment, Cable-Stayed Bridge, Steel Box Girder, Long Span, Nonlinearity, Damper, Structural System, Global Analysis

3- Videos : 2

Video [3]: The Rion Antirion Bridge - Harilaos Trikoupis Bridge

by: Eiffage CEVM / Foster & Partners / auteur du DVD

Keywords: Design Criteria, Design Phase,Reinforced Soil and Foundation Concept, Analyses of Reinforced Soil, Dynamic Analysis of Bridge, Behaviour of Reinforced Soil, Push-Over Analyses of Pylons,Pylon Base, Foundations and Tension Leg Platform, Cable-Stayed Bridge, Cable Stayed Bridge

Video [4]: Le Viaduc de Millau

Keywords: Bridge deck, Piers, Bridge Cross-Section, Launching System, Pylons Concept, Piers, Cable-Stayed Bridge, Cable Stayed Bridge

8- IABSE DATABASE of Articles on Structures Worldwide : 58

The Second Hooghly River Bridge, Calcutta

by: S. P. Gupta, 1991_N3_p7-9

Summary: A bridge across the River Hooghly of 823 m, is under construction in the metropolitan area of Calcutta in West Bengal, an eastern coastal state. It is a cable-stayed bridge with a 457.20 m main span, and two end spans of 182.88 m each. The bridge provides for a navigational clearance in the main span of the order of 33.87 m to 34.38 m. The bridge has two three-lane carriageways of 12.3 m each, divided by a median strip of 1.7 m, and 2.5 m wide footpaths on either side.

Keywords: Hooghly Bridge (Calcutta; India); Cable-stayed bridges; Bridge design; Pylons; Steel girders; Bending moments

Design of the Higashi-Kobe Bridge

by: M. Kitazawa, J. Noguchi, T.

E-Learning_IABSE Lecture [31]: Personal Involvement in early US Ca

by: Holger Svensson, LSI_2009_Keynote_Chicago

Summary: The personal involvement of the author in the early US cable-stayed bridges is outlined, including the Pasco and Huntington concrete bridges and the Burlington and Fred Hartman composite bridges.

Keywords: Cable-stayed bridges; design alternates; post-tensioning; concrete girders; composite girders; construction engineering; free-cantilevering; aerodynamic stability

E-Learning_IABSE Lecture [23]: Cable Vibrations in Cable-Stayed Bridges, part (1): Assessment, part (2): Mitigation

by: Elsa de SaCaetano, LSI_2010_Cable Vibrations in Cable-Stayed Bridges

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Load Tests of a Cable-Stayed Bridge in Coimbra, Portugal

by: Santos, LuÃs Oliveira; Min, Xu, 2007_N04_P337-341

Summary: Field load testing is an effective method to evaluate bridge performance and to calibrate structural models. This paper presents the load tests of the cable-stayed Rainha Santa Isabel Bridge which crosses the Mondego River near Coimbra, in Portugal. During these tests, several parameters were measured, like vertical displacements of the deck, horizontal displacements of the mast, rotations, strains and stay forces. Different types of equipment were used in order to get more accurate measurements. The experimental results are compared with the analytical values computed with a finite element model of the bridge.

Keywords: BRIDGES; CABLE-STAYED; LOAD TESTS; INSTRUMENTATION; FINITE ELEMENT METHOD

Rehabilitation of the Figueira da Foz Bridge

by: Prof., Proponte, Lda, Lisbon, Portugal, Julio Appleton, Prof., A2P Consult, Lda, Lisbon, Portugal, 2005_N02_p92-94

Summary: The Figueira da Foz Bridge over the River Mondego (Fig. 1) has a total length of 1421 m, including a 405 m long cable-stayed bridge and two approach viaducts with a length of 630 m on the left bank and 315 m on the right bank.The bridge was designed by Prof. Edgar Cardoso and built in 1982. The bridge is undergoing general rehabilitation and strengthening. (From the Introduction)

US Grant Bridge Replacement

by: Kumarasena, Sena; McCabe, Ray, 2008_N01__p56-61

Summary: When the original US Grant Suspension Bridge over Ohio River was built in 1927 replacing a ferry system that existed at the time; it opened up a new era at this key crossing point for people and commerce between Portsmouth Ohio and adjoining South Shore, Kentucky. Those who saw it first hand some 70 years ago still remember the transition. After nearly eight decades of service, the original bridge was found to be functionally deficient, too costly to maintain and impractical to upgrade by the Ohio Department of Transportation, and the historic bridge was removed in 2002 to make way for in-line replacement by a cable-stayed bridge. The new bridge not only provides higher functional standards with its wider roadways with generous shoulders but also improved river navigational conditions by virtue of its longer span. The new bridge, through this form following function design, has successfully met the Department's desire for an economical bridge providing higher level of serviceability with aesthetic appeal.

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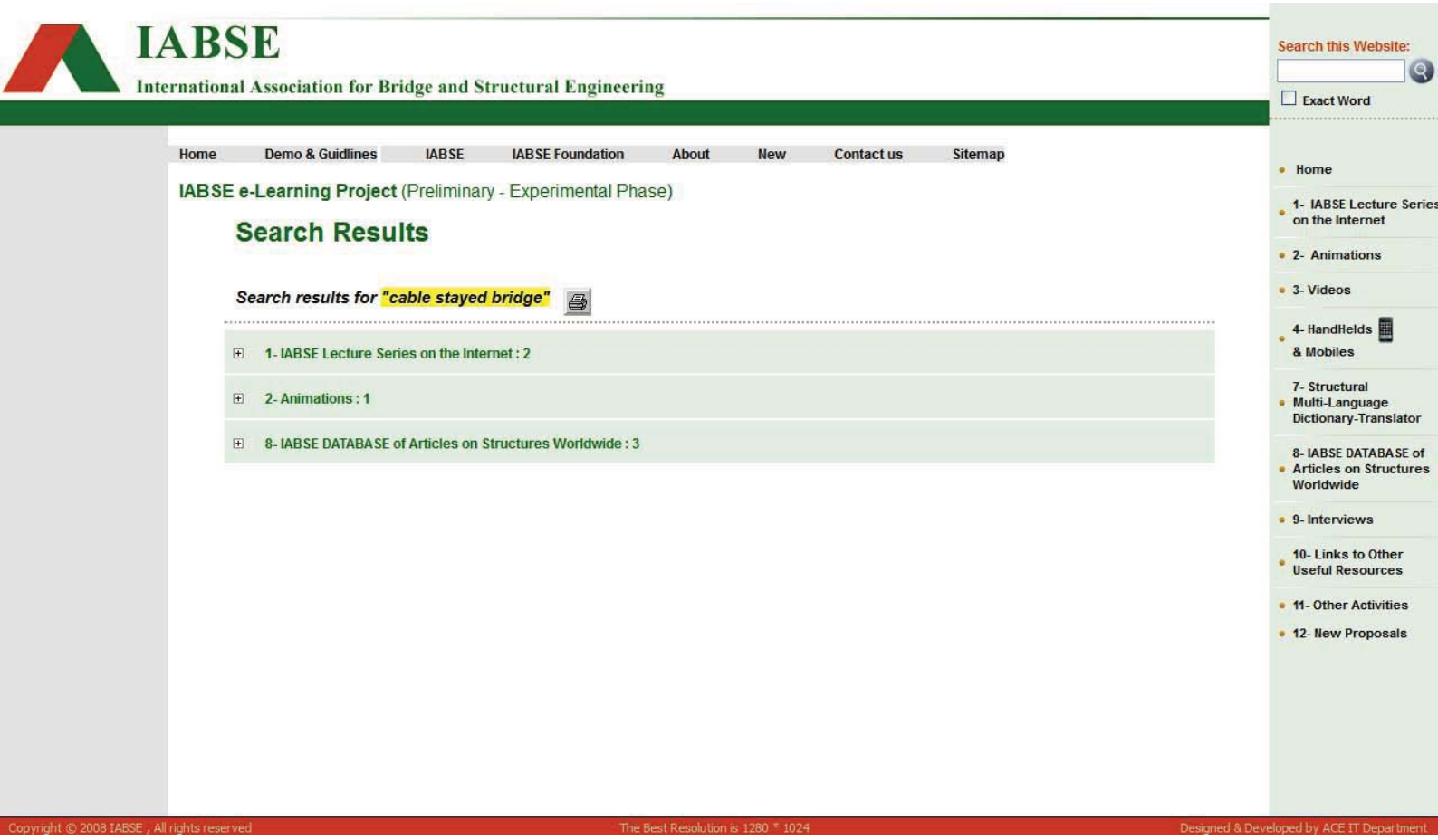

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Keywords: Hooghly Bridge (Calcutta; India); Cable-stayed bridges; Bridge design; Pylons; Steel girders; Bending moments

Design of the Higashi-Kobe Bridge

by: M. Kitazawa, J. Noguchi, T. Yamagami,, 1993_N4_p226-228

Summary: The Higashi-Kobe Bridge is an important link in the Osaka Bay Route. The bridge is a double-decked three-span cable-stayed structure 885 m long. Each deck carries three lanes of traffic. The center span of 485 m makes the Higashi-Kobe Bridge one of the longest cable-stayed bridges in the world. Earthquake- and wind-resistance were carefully considered in the design of the main girder, its suspension and the tower frames. Situated at the gateway to the port of Kobe, aesthetic considerations played an important role in the selection of the bridge configuration.

Keywords: Higashi-Kobe Bridge (Japan); Cable-stayed bridges; Earthquake resistance; Structural design; Wind resistance

The Normandie Bridge

by: M. Virolgeux,, 1994_N4_p208-213

Summary: On August 8, 1994. the last steel plate was welded to