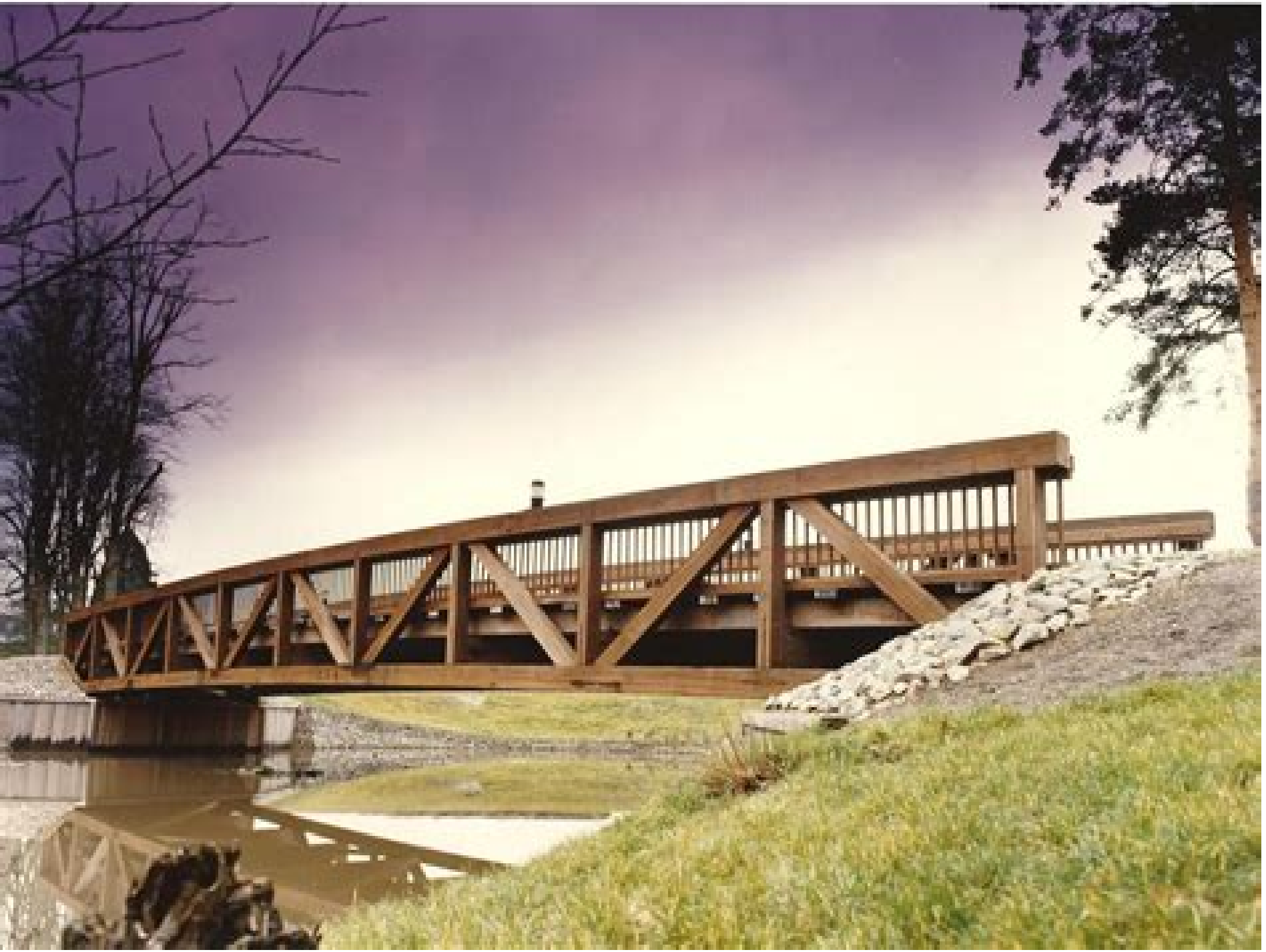

Timber Bridges Design Contruction Inspec

American Society of Civil Engineers

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Timber Bridges Michael A. Ritter,1990 This report presents a comprehensive analysis of the design construction inspection and maintenance of timber bridges Timber Bridges Michael A. Ritter,Departm U. S. Department of Agriculture,Forest Service U. S. Forest Service,2005 Timber s strength light weight and energy absorbing properties furnish features desirable for bridge construction Timber is capable of supporting short term overloads without adverse effects Contrary to popular belief large wood members provide good fire resistance qualities that meet or exceed those of other materials in severe fire exposures From an economic standpoint wood is competitive with other materials on a first cost basis and shows advantages when life cycle costs are compared Timber bridges can be constructed in virtually any weather conditions without detriment to the material Wood is not damaged by continuous freezing and thawing and resists harmful effects of de icing agents which cause deterioration in other bridge materials Timber bridges do not require special equipment for installation and can normally be constructed without highly skilled labor They also present a natural and aesthetically pleasing appearance particularly in natural surroundings The misconception that wood provides a short service life has plagued timber as a construction material Although wood is susceptible to decay or insect attack under specific conditions it is inherently a very durable material when protected from moisture Many covered bridges built during the 19th century have lasted over 100 years because they were protected from direct exposure to the elements In modem applications it is seldom practical or economical to cover bridges however the use of wood preservatives has extended the life of wood used in exposed bridge applications Using modem application techniques and preservative chemicals wood can now be effectively protected from deterioration for periods of50 years or longer In addition wood treated with preservatives requires little maintenance and no painting Another misconception about wood as a bridge material is that its use is limited to minor structures of no appreciable size This belief is probably based on the fact that trees for commercial timber are limited in size and are normally harvested before they reach maximum size Although tree diameter limits the size of sawn lumber the advent of glued laminated timber glulam some 40 years ago provided designers with several compensating alternatives Glulam which is the most widely used modem timber bridge material is manufactured by bonding sawn lumber laminations together with waterproof structural adhesives Thus glulam members are virtually unlimited in depth width and length and can be manufactured in a wide range of shapes Glulam provides higher design strengths than sawn lumber and provides better utilization of the available timber resource by permitting the manufacture of large wood structural elements from smaller lumber sizes Technological advances in laminating over the past four decades have further increased the suitability and performance of wood for modern highway bridge applications Timber Bridges Michael Ritter,1990-12 In this comprehensive classic manual the author describes the use of timber as bridge material types of timber bridges the properties of wood and wood products preservation and protection of timber bridges timber design concepts for bridges

loads and forces on timber bridges design of beam superstructures design of longitudinal deck superstructures design of longitudinal stress laminated deck superstructures rail systems for timber decks wearing surfaces for timber decks timber bridge fabrication and construction bridge inspection of decay and other deterioration maintenance rehabilitation and replacement of timber bridges This is a digitally recreated publication of the original manuscript 1990 comprising over 900 pages produced in its entirety Wood was probably the first material used by humans to construct a bridge Although in the 20th century concrete and steel replaced wood as the major materials for bridge construction wood is still widely used for short and medium span bridges Of the bridges in the United States with spans longer than 20 feet approximately 12 percent of them or 71 200 bridges are made of timber In the USDA Forest Service alone approximately 7 500 timber bridges are in use and more are built each year The railroads have more than 1 500 miles of timber bridges and trestles in service In addition timber bridges recently have attracted the attention of international organizations and foreign countries including the United Nations Canada England Japan and Australia **Timber Bridges** Christopher J. Mettem,2013-04-15 Bridges built in timber are enjoying a significant revival both for pedestrian and light traffic and increasingly for heavier loadings and longer spans Timber s high strength to weight ratio combined with the ease and speed of construction inherent in the off site prefabrication methods used make a timber bridge a suitable option in many different scenarios This handbook gives technical guidance on forms materials structural design and construction techniques suitable for both small and large timber bridges Eurocode 5 Part Two BS EN 1995 2 for the first time provides an international standard for the construction of timber bridges removing a potential obstacle for engineers where timber construction for bridges has not in recent centuries at least been usual Clearly illustrated throughout this guide explains how to make use of this oldest construction material in a modern context to create sustainable aesthetically pleasing practical and durable bridges Worldwide examples include Tourand Creek Bridge Canada Toijala Finland Punt la Resgia Switzerland Pont de Crest France Almorere Pylon Bridge the Netherlands Bridge Engineering Handbook, Second Edition Wai-Fah Chen,Lian Duan,2014-01-24 Over 140 experts 14 countries and 89 chapters are represented in the second edition of The Bridge Engineering Handbook This extensive collection highlights bridge engineering specimens from around the world contains detailed information on bridge engineering and thoroughly explains the concepts and practical applications surrounding the subject Published in five books Fundamentals Superstructure Design Substructure Design Seismic Design and Construction and Maintenance this new edition provides numerous worked out examples that give readers step by step design procedures includes contributions by leading experts from around the world in their respective areas of bridge engineering contains 26 completely new chapters and updates most other chapters It offers design concepts specifications and practice as well as the various types of bridges The text includes over 2 500 tables charts illustrations and photos The book covers new innovative and traditional methods and practices explores rehabilitation retrofit and maintenance and examines seismic design and building materials The first

book Fundamentals contains 22 chapters and covers aesthetics planning design specifications structural modeling fatigue and fracture What s New in the Second Edition Covers the basic concepts theory and special topics of bridge engineering Includes seven new chapters Finite Element Method High Speed Railway Bridges Concrete Design Steel Design Structural Performance Indicators for Bridges High Performance Steel and Design and Damage Evaluation Methods for Reinforced Concrete Beams under Impact Loading Provides substantial updates to existing chapters including Conceptual Design Bridge Aesthetics Achieving Structural Art in Bridge Design and Application of Fiber Reinforced Polymers in Bridges This text is an ideal reference for practicing bridge engineers and consultants design construction maintenance and can also be used as a reference for students in bridge engineering courses *Timber Bridges* National Research Council (U.S.). Transportation Research Board,1986 **Bridge Maintenance Inspection and Evaluation, Second Edition** Kenneth White,1992-05-05 Second Edition examines in detail the process of evaluating bridge conditions and offers a thorough study of bridge types their origins elements and failures Bridge Maintenance Inspection and Evaluation Second Edition presents new and expanded information on condition ratings capacity evaluations load factor analysis and the American Association of State Highway and Transportation Officials AASHTO suggested guidelines **Crossings** ,1990 User Friendly Guide to Timber Bridges ,199? **Quality Assurance and Inspection Manual for Timber Bridges** Julio F. Davalos,1992 *AASHTO LRFD Bridge Design Specifications* American Association of State Highway and Transportation Officials,1994 **Design of Highway Bridges** Richard M. Barker,Jay A. Puckett,1997-03-17 Design of Highway Bridges provides a complete introduction to this important area of engineering with comprehensive coverage of the theory specifications and procedures for the design of short and medium span bridges Beginning with an overview of bridge engineering history the book examines key bridge types selection principles and aesthetic considerations Design issues are then discussed in detail from limit states and loads to resistance factors and substructure design *Timber Bridge Demonstration Project, the North Road Bridge, Foster, Rhode Island* Eileen D. Young,1995 **The Engineering Index** ,1922 Since its creation in 1884 Engineering Index has covered virtually every major engineering innovation from around the world It serves as the historical record of virtually every major engineering innovation of the 20th century Recent content is a vital resource for current awareness new production information technological forecasting and competitive intelligence The world s most comprehensive interdisciplinary engineering database Engineering Index contains over 10 7 million records Each year over 500 000 new abstracts are added from over 5 000 scholarly journals trade magazines and conference proceedings Coverage spans over 175 engineering disciplines from over 80 countries Updated weekly **Seismic Vulnerability of Timber Bridges and Timber Substructures** Ayman A. Shama,2007 *Proceedings of the American Society of Civil Engineers* American Society of Civil Engineers,1929 Vols for Jan 1896 Sept 1930 contain a separately page section of Papers and discussions which are published later in revised form in the society s Transactions Beginning Oct 1930 the Proceedings are limited to technical

papers and discussions while Civil engineering contains items relating to society activities etc Proceedings ,1923

Field Testing and Evaluation of a Demonstration Timber Bridge Travis Hosteng,2012 Asphalt wearing surfaces are commonly used on timber bridges with transverse glued laminated deck panel systems to help protect the timber components However poor performance of these asphalt wearing surfaces in the past has resulted in repeated repair and increased maintenance costs This report describes the field demonstration and testing of a newly constructed glued laminated timber girder bridge Previous field work revealed that differential panel deflections in the glued laminated deck were one significant factor resulting in the premature failure of the asphalt wearing surfaces on these bridges In addition laboratory work subsequent to the field testing attempted to address the problematic asphalt cracking common in transverse glued laminated panel decks by testing several deck joint connection alternatives The field demonstration project described in this report showcases the retrofit detail that was determined to provide the best field performance The project was a cooperative effort between the Bridge Engineering Center BEC at Iowa State University and the United States Department of Agriculture USDA Forest Service Forest Products Laboratory FPL **Industrial Arts Index** ,1921 Covered Bridge Manual Phillip C. Pierce,2005

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