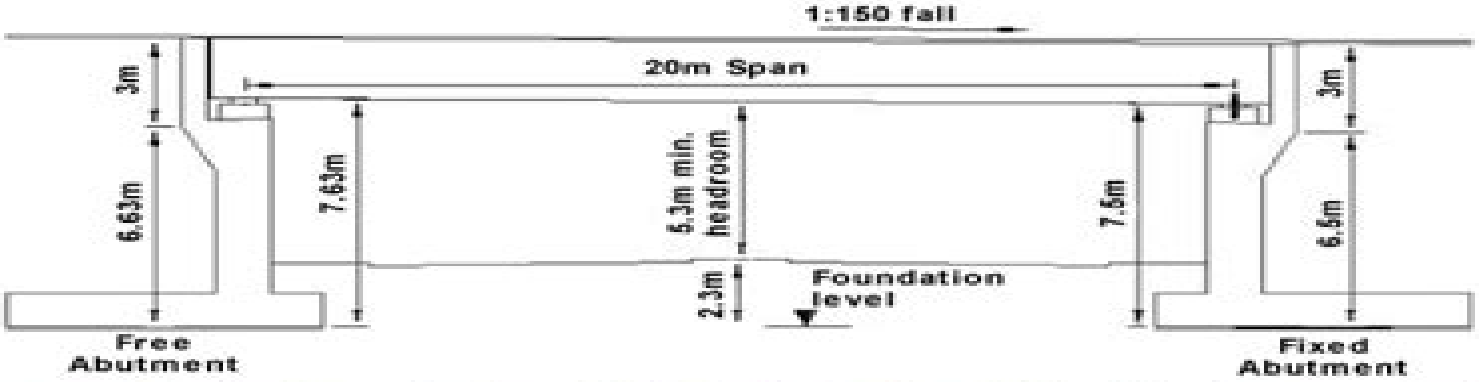
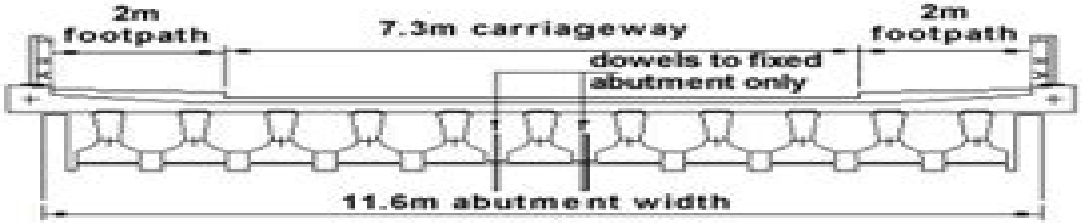
Abutment Design Example to BD 30

Design the fixed and free end cantilever abutments to the 20m span deck shown to carry HA and 45 units of HB loading. Analyse the abutments using a unit strip method. The bridge site is located south east of Oxford (to establish the range of shade air temperatures).



The ground investigation report shows suitable founding strata about 9.5m below the proposed road level. Test results show the founding strata to be a cohesionless soil having an angle of shearing resistance (ϕ) = 30° and a safe bearing capacity of 400kN/m^2.

Backfill material will be Class 6N with an effective angle of internal friction (ϕ') = 35° and density (γ) = 19kN/m^3.



The proposed deck consists of 11No. Y4 prestressed concrete beams and concrete deck slab as shown.

Loading From the Deck

A grillage analysis gave the following reactions for the various load cases:

	Critical Reaction Under One Beam		Total Reaction on Each Abutment	
	Nominal Reaction (kN)	Ultimate Reaction (kN)	Nominal Reaction (kN)	Ultimate Reaction (kN)
Concrete Deck	180	230	1900	2400

Abutment Design Example Arema Railroad Bridge

F. W. Klaiber,Iowa. Highway Research Board,Iowa. Highway Division

Abutment Design Example Arema Railroad Bridge:

Innovative Bridge Design Handbook Alessio Pipinato,2021-09-08 Innovative Bridge Design Handbook Construction Rehabilitation and Maintenance Second Edition brings together the essentials of bridge engineering across design assessment research and construction Written by an international group of experts each chapter is divided into two parts the first covers design issues while the second presents current research into the innovative design approaches used across the world This new edition includes new topics such as foot bridges new materials in bridge engineering and soil foundation structure interaction All chapters have been updated to include the latest concepts in design construction and maintenance to reduce project cost increase structural safety and maximize durability Code and standard references have been updated Completely revised and updated with the latest in bridge engineering and design Provides detailed design procedures for specific bridges with solved examples Presents structural analysis including numerical methods FEM dynamics risk and reliability and innovative structural typologies **Design and Construction of Modern Steel Railway Bridges** John F. Unsworth,2017-08-03 This new edition encompasses current design methods used for steel railway bridges in both SI and Imperial US Customary units It discusses the planning of railway bridges and the appropriate types of bridges based on planning considerations **Track Design Handbook for Light Rail Transit** ,2012 TCRP report 155 provides guidelines and descriptions for the design of various common types of light rail transit LRT track The track structure types include ballasted track direct fixation ballastless track and embedded track The report considers the characteristics and interfaces of vehicle wheels and rail tracks and wheel gauges rail sections alignments speeds and track moduli The report includes chapters on vehicles alignment track structures track components special track work aerial structures bridges corrosion control noise and vibration signals traction power and the integration of LRT track into urban streets **Design of Track Transitions** David Read,Transit Cooperative Research Program,2006 This digest summarizes the results of TCRP Project D 7 Task 15 The digest was prepared by the Transportation Technology Center Inc David Read and Dingqing Li served as principal authors **Track Design Handbook for Light Rail Transit** Parsons, Brinckerhoff, Quade & Douglas,2000 The Handbook provides guidelines and descriptions for the design of various types of light rail transit track The track structure types covered include ballasted direct fixation ballastless and embedded track The components of the various track types are discussed in detail The guidelines consider the characteristics and interfaces of vehicle wheels and rail track and wheel gauges rail sections alignments speeds and track moduli **Single Point Urban Interchange Design and Operations Analysis** Carroll J. Messer,1991 *The Detailed Design of a Railroad Bridge* William Hubert Burr,Myron Samuel Falk,1904

Design of a Reinforced Concrete Railway Bridge Abutment ,1921 **The Detailed Design of a Railroad Bridge** William Hubert Burr,Myron Samuel Falk,2023-07-18 This comprehensive guide to the detailed design of a railroad bridge provides essential information for both novice and experienced engineers Falk and Burr cover topics such as bridge materials

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included Generic standard abutment plans were developed for which the engineer can provide necessary bridge site information in the spaces provided These tools enable engineers to design and detail county bridge substructures more efficiently The third volume provides two sets of calculations that demonstrate the application of the substructure design methodology developed in this project These calculations also verify the accuracy of the foundation design template The printouts from the foundation design template are provided at the end of each example Also several tables provide various foundation details for a pre cast double tee superstructure with different combinations of soil type backwall height and pile type *Development of Abutment Design Standards for Local Bridge Designs: Development of design methodology* ,2004 Several superstructure design methodologies have been developed for low volume road bridges by the Iowa State University Bridge Engineering Center However to date no standard abutment designs have been developed Thus there was a need to establish an easy to use design methodology in addition to generating generic abutment standards and other design aids for the more common substructure systems used in Iowa The final report for this project consists of three volumes The first volume summarizes the research completed in this project A survey of the Iowa County Engineers was conducted from which it was determined that while most counties use similar types of abutments only 17 percent use some type of standard abutment designs or plans A literature review revealed several possible alternative abutment systems for future use on low volume road bridges in addition to two separate substructure lateral load analysis methods These consisted of a linear and a non linear method The linear analysis method was used for this project due to its relative simplicity and the relative accuracy of the maximum pile moment when compared to values obtained from the more complex non linear analysis method The resulting design methodology was developed for single span stub abutments supported on steel or timber piles with a bridge span length ranging from 20 to 90 ft and roadway widths of 24 and 30 ft However other roadway widths can be designed using the foundation design template provided The backwall height is limited to a range of 6 to 12 ft and the soil type is classified as cohesive or cohesionless The design methodology was developed using the guidelines specified by the American Association of State Highway Transportation Officials Standard Specifications the Iowa Department of Transportation Bridge Design Manual and the National Design Specifications for Wood Construction The second volume introduces and outlines the use of the various design aids developed for this project Charts for determining dead and live gravity loads based on the roadway width span length and superstructure type are provided A foundation design template was developed in which the engineer can check a substructure design by inputting basic bridge site information Tables published by the Iowa Department of Transportation that provide values for estimating pile friction and end bearing for different combinations of soils and pile types are also included Generic standard abutment plans were developed for which the engineer can provide necessary bridge site information in the spaces provided These tools enable engineers to design and detail county bridge substructures more efficiently The third volume provides two sets of calculations that demonstrate the application of the

substructure design methodology developed in this project These calculations also verify the accuracy of the foundation design template The printouts from the foundation design template are provided at the end of each example Also several tables provide various foundation details for a pre cast double tee superstructure with different combinations of soil type backwall height and pile type **Complete design of a railroad bridge** Robert Andrew Thompson,1892 **Design and Estimate of Cost of a Highway Bridge and Abutments Across a Four-track Railroad** H. A. Norman,1913 **Design for a Steel Railroad Bridge** Clinton C. Barker,1908 Design of a Steel Railroad Bridge John Herbert Gregory,1895

Design of a Reinforced Concrete Railroad Arch Bridge O T Allen,2023-07-18 First published in 1911 this classic engineering text remains a valuable resource for students and practitioners of structural design Drawing on real world examples and cutting edge research O T Allen provides a comprehensive guide to the design and construction of reinforced concrete bridges with a particular focus on arch bridges for railroad applications The text is enhanced by numerous illustrations and diagrams This work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it This work is in the public domain in the United States of America and possibly other nations Within the United States you may freely copy and distribute this work as no entity individual or corporate has a copyright on the body of the work Scholars believe and we concur that this work is important enough to be preserved reproduced and made generally available to the public We appreciate your support of the preservation process and thank you for being an important part of keeping this knowledge alive and relevant Design for a Double Track Masonry Railroad Bridge Frank Johnson,1903 *Design of a 120 Foot Steel Spandrel-braced Two Hinged Arch Railroad Bridge* E L Curren,A L Hess,2023-07-18 This book provides a detailed study of the design of a 120 foot steel spandrel braced two hinged arch railroad bridge It covers the different components of the bridge such as the piers and abutments and provides detailed instructions for their design This book is essential for bridge engineers researchers and enthusiasts This work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it This work is in the public domain in the United States of America and possibly other nations Within the United States you may freely copy and distribute this work as no entity individual or corporate has a copyright on the body of the work Scholars believe and we concur that this work is important enough to be preserved reproduced and made generally available to the public We appreciate your support of the preservation process and thank you for being an important part of keeping this knowledge alive and relevant Design of a Reinforced Concrete Arch Railroad Bridge A. A. Dedouloff,1922

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