



PREFACE

The primary purpose of the *Bridge Design Practice Manual* (BDP) is to provide bridge design engineers with guidance on the application of the California Department of Transportation (Caltrans) design standards and practices that lead to consistency in the design of bridges and highway structures in California. The BDP describes basic design concepts and assumptions; provides step-by-step design examples; introduces innovative practice, and serves as a comprehensive reference manual for bridge design engineers.

The first edition of the *Bridge Design Practice Manual* (BDP) was published in 1960, and the second and third editions were published in 1963 and 1971, respectively. Various chapters of the BDP have been published continually since the 1990s. The fourth edition of the BDP with 15 chapters was published online in February 2015.

The fifth edition conforms to the *AASHTO LRFD Bridge Design Specifications*, the eighth Edition with *California Amendments*, *Caltrans Seismic Criteria*, Version 2.0, *Caltrans Seismic Design Specifications for Steel Bridges*, Second Edition, *Structure Technical Policies*, and *Bridge Design Memos*. The chapters are numbered in alignment with the *AASHTO LRFD Bridge Design Specifications*. A total of 17 chapters are published online at this time, with more to follow.

The development of the fifth edition of the BDP was a team effort and a product of the Bridge Design subdivision of the Division of Engineering Services. Many individuals unselfishly gave their time and talents. Their efforts are gratefully acknowledged. The individuals who have made major contributions to the 17 chapters are as follows:

- Chapter 1 “Bridge Design Specifications” was updated by Lian Duan.
- Chapter 3 “Loads and Load Combinations” was updated by Keith Nakaoka.
- Chapter 4 “Structural Modeling and Analysis” was updated by Keith Nakaoka.
- Chapter 5.1 “Concrete Design Theory” was updated by Jinrong Wang.
- Chapter 5.2 “Post-Tensioned Concrete Girders” was updated by Prem Rimal.
- Chapter 5.3 “Precast Pretensioned Concrete I-Girders” was updated by Ahmed Elsadek Manhy and Jim Ma.
- Chapter 5.4 “Precast Pretensioned Concrete Box Girders” was written by Say-Gunn Low, Jay Holombo (TYLin), and Peter Smith (TYLin).
- Chapter 5.5 “Precast Pretensioned Concrete Voided Slabs” was written by Jim Ma, Peter Smith (TYLin) and Jay Holombo (TYLin).
- Chapter 5.6 “Concrete Bent Caps” was updated by Nora Kyo.



- Chapter 5.7 “Concrete Columns” was updated by Austin Prince.
- Chapter 6.1 “Steel Design Theory” was updated by Lian Duan.
- Chapter 6.2 “Steel Plate Girders” was updated by Lian Duan and Pete Norboe.
- Chapter 11.1 “Abutments” was written by Nora Kyo and Amir Malek.
- Chapter 11.2 “Earth Retaining Systems” was written by Anooshirvan Shamsabadi, Rizia Da Cruz Ferreira, Bin Shen, Kathryn Griswell, Gary Hight, Mina Pezeshpour, and Gary Wang.
- Chapter 16.1 “Strengthening Steel Girders for Live Loads” was written by Duan Wang, Suresh Dhakal, Tommy Hua, and Lian Duan.
- Chapter 20.1 “Seismic Design of Concrete Bridges” was updated by Sam Ataya, Dawit Mebrahtom, and Larry Wu.
- Chapter 20.2 “Seismic Design of Steel Bridges” was written by Lian Duan, Bill Addlespurger, Larry Wu, Yong-Pil Kim, Sue Hida, Mohamed Akkari, and Tariq Masroor.

The following chapters are still under development and will be published in due course.

- Chapter 2 “Bridge Architecture and Aesthetics”
- Chapter 9.1 “Concrete Decks”
- Chapter 10.1 “Shallow Foundations”
- Chapter 10.2 “Deep Foundations”
- Chapter 12.1 “Buried Structures”
- Chapter 14.1 “Bearings”
- Chapter 14.2 “Expansion Joints”

The fifth edition of the BDP was prepared under the direction of Don Nguyen-Tan as BDP Manager, Lian Duan, and Nora Kyo as BDP Editors. The Division of Engineering Services Technical Committees performed technical reviews; Bill Addlespurger, Craig Knapp, Todd Lambert, and Tom Ruckman conducted independent quality assurance reviews.

Gudmund Setberg

11/08/2022

Gudmund Setberg
State Bridge Design Engineer
Bridge Design
Division of Engineering Services