# Bridge Design Manual

NEBRASKA

Good Life. Great Journey.

DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

## November 12, 2024

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# Foreword

I am pleased to introduce you to the new Bridge Design Manual (BDM). If you are familiar with the Bridge Office Policy and Procedures (BOPP), you will first notice the name change. This updated title reflects the manual's true purpose—presenting policy and standards specifically related to bridge design within the department. While the BDM serves as a critical reference for bridge design policies, it is not intended to encompass all policies or procedures related to bridges in general. Our goal was to provide a clear, concise, and accessible resource for bridge design practices.

We greatly appreciate the patience of our community as we worked toward the publication of this comprehensive document. The development and maintenance of such a resource is no small feat, especially while meeting our ongoing obligations to the public. This delay does not reflect a lack of priority—it's quite the opposite. The manual is an essential tool, but its creation had to be balanced with the day-to-day demands of public service.

To ensure the most up-to-date information is always available, we are rolling out the manual chapter by chapter. This phased approach allows us to provide critical design guidance as it becomes ready while continuing to refine additional sections. Over the next year, more chapters will be released to keep the manual current with the evolving needs of our industry. In addition, interim revisions will be issued as NDOT Policy Letters, which will be posted on our website and take effect immediately upon transmittal. Please keep an eye out for these updates.

Chapter 7 is a particularly exciting addition, as it focuses on Repair and Preservation. It is entirely new to the manual and represents a compilation of preferences and practices within the NDOT Bridge Division. We are eager to share this chapter with bridge owners across the state, believing it will serve as a valuable resource for aligning bridge repair and preservation practices statewide.

Recognizing the need for a structured approach to policy development, we established an executive BDM committee, along with subcommittees composed of members across the Bridge Division. This framework formalizes the process for creating, reviewing, and publishing bridge design policies and ensures active engagement from all levels within the division. By adopting a collaborative and systematic approach, we are able to incorporate national and regional research, ensuring our policies reflect the latest advancements and maintain NDOT's position at the forefront of bridge design.

This approach also supports the development of the next generation of bridge engineers. With the challenges our industry faces, it is more important than ever to equip younger and less experienced staff with the knowledge and resources they need to grow. This manual serves not only today's professionals but also as a guide for those just entering the field, ensuring they are well-prepared for the demands of modern bridge design.

I encourage everyone who uses this document to provide feedback and suggestions for revisions or future policy development. We've outlined the process for submitting suggestions to the Bridge Division, and I ask that we all actively engage in shaping what future policy could and should be. All input will be carefully considered, and revisions will be incorporated into the manual as appropriate.

I would like to extend a special thanks to Kyle Zillig for his vision and leadership in keeping the team organized and focused throughout the manual's development. Additionally, I want to thank Mike Vigil and Ben Ptacek for their efforts in developing the brand-new chapter on Repair and Preservation, and Matt Wieseler for his significant contributions to the development of the various chapters, and his dedication in formatting the manual. Lastly, a big thank you to Emilie Hudon, our newly appointed Bridge Policy and Quality Assurance Engineer, for her energy and leadership in driving us toward a final document in a remarkably short time. Your collective hard work and commitment have been invaluable throughout this evolution of the Bridge Design Manual.

Ross Barron, PE
State Bridge Engineer

# Acknowledgments

The Bridge Division recognizes the efforts of the BDM Executive committee who helped to develop with the development of the 2024 BDM:

| | |
|---|---|
| Emilie Hudon, PhD, PE | Bridge Policy and Quality Assurance Engineer |
| Matt Wieseler, PE, SE | Bridge Policy and Quality Assurance Assistant Engineer |
| Kyle Zillig, PE | Bridge Design Engineer |
| Mike Vigil, PE | Bridge Management Engineer |
| Kirk Harvey, PE | Bridge Hydrology and Hydraulics Engineer |
| Ross Barron, PE | State Bridge Engineer |

Additional assistance was provided by the consulting firm Benesch, and their representative, Aaron Buettner, PE.

# Revisions

The NDOT Bridge Design Manual provides current policies and procedures for use in structural design projects within Nebraska. To ensure that the manual remains up to date and appropriately reflects changes in NDOT's needs and requirements, its contents will be updated on a periodic basis.

Users of this manual should monitor the Bridge Division website for Policy Letters and revisions to the manual.

The Bridge Division is responsible for evaluating changes in structural engineering literature (e.g., updates to the AASHTO LRFD Specifications, issuance of new relevant publications, revisions to federal regulations) and for ensuring that these changes are appropriately addressed through revisions to the Bridge Design Manual. It is important that users of the manual inform NDOT of any inconsistencies, errors, need for clarification, or new ideas to support the goal of providing the best and most up-to-date information possible.

Our standard details can be found on ProjectWise. Please refer to these documents when making suggestions for drawing revisions.

Revisions to the Bridge Design Manual between major releases (interim revisions) are issued through Policy Letters. Requirements detailed in these memoranda are effective and enforceable on the effective date listed in the Letter and in the Transmittal Log located on the NDOT website.

To propose a revision to the Bridge Design Manual contact the Bridge Policy and Quality Assurance Engineer at emilie.hudon@nebraska.gov, be sure to include "Bridge Design Manual" in the subject line and provide the following:

- Manual section number(s)
- Proposed revision
- Justification for revision

# Abbreviated Table of Contents

# Table of Contents

# List of Figures

# List of Tables

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