

Technical Writing Guide: 2017 Maryland Wood Bridge Challenge

This technical writing guide details the suggested format and contents for a successful design report. There is no required format, but following this guide will ensure you have the minimum expected sections and information, in a format amenable to achieving your goal to inform your target audience.

In writing a design report, writers should follow standard practices in good writing. Reports should reflect consistency throughout the report, in format, abbreviations, style, and descriptors. Writers should also carefully mind tense, grammar, and spelling. Lastly, good reports are appropriately concise to efficiently deliver the information.

More advice on writing a technical report may be found at writing.engr.psu.edu/workbooks/design.html.

FORMAT

The following formatting conventions are advised when writing technical reports:

- Times New Roman, size 11 or 12 font
- 1.15 line spacing
- Four 1” margins
- Page numbers at bottom center, bottom right, or top right (no number on title page; i, ii, iii... for the contents tables and lists; 1, 2, 3... starting with the Introduction; A-1, A-2, A-3... for appendices)
- DO NOT double space after sentences; modern word processors already account for this
- DO NOT right justify; it decreases readability
- Format paragraphs either with a half inch indent and no spacing between paragraphs or no indent and one empty line between paragraphs
- Chapter headings and subheadings must be evident, consistent, and descriptive. Writers may note and follow the format in this guide or implement their own format, and may adopt a numbering system.
- Tables should be numbered and captioned (eg. Table 1. Member properties); captions should appear above the tables. Figures should be numbered and captioned likewise; captions go below their figures. Tables and figures should be centered. All tables and figures should be introduced first in the text.

CONTENTS

Title Page

A comprehensive title page includes the report title, challenge, team member name(s), school or program, teacher or adviser (if applicable), and submission date.

A picture of the bridge may be included on the title page or early in the report to help the reader visualize the bridge design.

Table of Contents

This table includes all chapter headings and subheadings, starting with the Introduction, along with their initial page number. Most word processors allow the writer to break sections and denote headings, then generate a table of contents automatically, with the ability to automatically update page numbers.

List of Tables, List of Figures, List of Abbreviations (if applicable)

Reports with at least one table or one figure must have the requisite lists at the beginning of the report. Tables include written material or data, whereas figures have non-textual illustrative material. These lists may be generated similar to the Table of Contents as a secondary table of contents.

Reports with numerous abbreviations should also have an introductory list of abbreviations for clarity.

Summary

The Summary should briefly introduce the project timeline, reasons for undertaking this design project, stages in the project from beginning to end, and measured and/or anticipated results. It is meant as a snapshot to the reader, such that they can learn the major information in short time and read the specific report sections where they have questions or want more detail and/or when they have more time to read. Concision without sacrificing completeness is paramount; after reading the Summary, a reader should have a firm understanding of the design and the report contents. A good summary is also interesting to entice further reading. Keep this section to roughly one-half to two-thirds page.

Introduction

The Introduction expands on the Summary by effectively setting the foundation and tone for the report. The Introduction first completely describes the project parameters, including a summary of specifications, materials, and locations. Next, introduce all people involved in the project and their roles. Then describe the major events in the design, construction, and testing process. Finally, introduce the report contents. Keep this section to roughly one page.

Discussion

The Discussion is the most important and longest section in the design report, as it is effectively the essence for the report. A thorough Discussion will detail the project stages alluded to in the Summary and described briefly in the Introduction. These project stages include, at a minimum, design, construction, and testing. As it pertains to the design, a thorough writer may include preliminary testing for the basswood, adhesives, and critical components or truss sections and a separate section for full-scale testing of the final design. Other sections are also possible in a complete report and up to the writer for inclusion. Pictures are highly encouraged in these sections where they enhance the reader's comprehension.

Design

This section may explain in detail real bridges that served as design inspiration, how the specifications guided the design and how the design met or was limited by the specifications, and why certain design choices were made as they were. The reader should ultimately understand how the design evolved from the imagination to a tangible concept to a final, refined design ready for construction. A well-written design section explains key technical design principles and demonstrates a sound understanding of the engineering and physics principles used in the design. Modeling and preliminary testing may be included in this section or as separate sections if their length and detail justify their own sections.

Construction

This section may explain all processes, methodology, materials, equipment, and chronology in the construction of the bridge(s). Effective discussion of construction will demonstrate attention to how the chosen construction increases the structural strength and efficiency and demonstrates high workmanship. In real world bridge construction, the sequence of construction must be well thought and checked to ensure ease of construction and acceptable stressing of members and sections; a similar attention and thought should be reflected in the model wood bridge construction.

Testing

This section should, at a minimum, explain the competition testing. If the team completed testing of similar models as part of an iterative design, this would be great information to include here. If first tests will take place at the competition, anticipated strength and structural efficiency should be predicted.

Conclusions

The Conclusions should convey what the writer/engineer or team learned in the design process, including challenges experienced and overcome specific to the structural engineering, or general conclusions about science, math, and engineering. A great Conclusions section would also explain recommendations to future teams or how the engineer or team would change parts of their design process and what parts of the design process went excellently, worked best, or surpassed expectations. This section should conclude with an honest appraisal of the engineer or team's success and thoughts regarding the project as a whole.

Appendices

Information that is too long, unwieldy, or supplemental in nature to include in the report body should be reported in appendices. This may include (but is certainly not limited to) specifications, computer models, design calculations, construction plans, and additional pictures. Each sequential appendix should be given a letter and representative title (eg. Appendix A. Design Calculations), and follow a new page numbering format specific to the appendices (eg. A-1, A-2, A-3... B-1, B-2...).

References

If any books, technical papers, websites, presentations, etc. were used to develop the bridge design or included as support in the paper, they must be acknowledged to give proper credit and referenced.